TRANSMITTAL

To: **THE COUNCIL**

Date: 10/7/2016

From: **THE MAYOR**

TRANSMITTED FOR YOUR CONSIDERATION. PLEASE SEE ATTACHED.



(Ana Guerrero)

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August 26, 2016

#2 BOS
BPW-2016-0191

Mayor Eric Garcetti
Room No. 305
City Hall
Attn: Mandy Morales

Subject: **AUTHORITY TO ADOPT THE SOUTH LOS ANGELES GREEN ALLEY MASTER PLAN**

As recommended in the accompanying report of the Director of the Bureau of Sanitation, which this Board has adopted, the Board of Public Works requests approval and forwarding to the City Council for approval and authorization to implement the South Los Angeles Green Alley Master Plan (SLAGAMP), as one of the first of many Green Alleys Handbooks that can be used as a model for developing green alleys in other communities in the City, Los Angeles County and around the State.

FISCAL IMPACT

The SLAGAMP will not impact the City's General Fund.

Respectfully submitted,

Fernando Campos, Executive Officer
Board of Public Works

FC:mp

DEPARTMENT OF PUBLIC WORKS

BUREAU OF SANITATION
BOARD REPORT NO. 2
August 26, 2016

CD: 8, 9

AUTHORITY TO ADOPT THE SOUTH LOS ANGELES GREEN ALLEY MASTER PLAN

RECOMMENDATIONS

1. Approve and forward this report with the transmittal to the Mayor and City Council to request approval of the South Los Angeles Green Alley Master Plan (SLAGMP).

2. Request the Mayor and City Council to authorize the President or two members of the Board of Public Works to adopt SLAGMP.

TRANSMITTALS

1. South Los Angeles Green Alley Master Plan

FISCAL IMPACT STATEMENT

The SLAGAMP will not impact the City's General Fund.

DISCUSSION

The Community Redevelopment Agency of the City of Los Angeles (CRA/LA), in partnership with a non-profit organization, The Trust for Public Land (TPL), prepared a successful grant application with the California Natural Resources Agency (CNRA) for the South Los Angeles Green Alley Master Plan (SLAGAMP).

SLAGAMP is a plan to construct a network of green alleys, streets and community connections in one of the most underserved and economically challenged areas of the City of Los Angeles. SLAGAMP included specific design guidelines and policy recommendations for the creation of three to five green alley and street networks. The planning efforts centered on a 16 square mile area of South Los Angeles with an emphasis on how to create green alley networks that promote infill development, improve community walkability (thereby reducing Vehicle Miles Traveled), develop new and attractive spaces for outdoor exercise and promote multi-benefit infrastructure improvements with a focus on stormwater capture and infiltration.

The entire 16 square mile area of South Los Angeles is framed by the 10 freeway to the north, Florence Avenue to the South, Alameda Street on the east and Western Avenue to the west. SLAGAMP mapped South Los Angeles at two scales: the study area scale (includes the entire 16 square mile area) and the sub-area scale (smaller one to two mile square sub areas).

Mapping and background research focused on identifying which alleys have the greatest potential to create pedestrian and bike connections through the community, add green and useable open space, capture and treat stormwater, increase local supplies of groundwater, decrease greenhouse gas emissions and improve the quality of life for residents of South Los Angeles. SLAGAMP is first of the many Green Alleys Handbooks that can be used as a model for developing green alleys in other communities in the City, Los Angeles County and around the state.

On March 8, 2011, CRA/LA and TPL executed the Memorandum of Understanding (MOU) to implement the Project. Once redevelopment agencies throughout California were dissolved, the project was transferred from CRA/LA to LA Sanitation (LASAN). On April 10, 2012, LASAN received authority from the Mayor and City Council to execute a sole source contract with TPL (Council File No. 12-0170-S1). It took another two months for CNRA to execute the grant agreement (Grant Agreement No. 3010-516) on June 12, 2012.

On August 2, 2013, the City Clerk executed the MOU (Contract Number C-122718) between LASAN and TPL. The MOU compensated TPL for grant-related expenses incurred for the entire grant term (June 12, 2012 to June 30, 2015). CNRA stated that the City will only be compensated for work performed by TPL beginning August 2, 2013. In an email dated October 22, 2013, CNRA finally agreed to compensate the City for the work performed by TPL as long as the proper documentation (i.e., timesheets) is provided.

On April 29, 2015, LASAN staff submitted the final report, final progress report, final invoice and SLAGAMP to CNRA. The grant agreement required the City's Department of Public Works to adopt and certify the SLAGAMP before the State is able to close out the agreement.

The closing out of the grant will enable the City to apply for future grant funding under Strategic Growth Council- Sustainable Communities Planning Grant Program, Active Transportation Program and Proposition 84 Stormwater Grant Program. The City previously awarded grant funding from Proposition 84 Stormwater Grant Program for Avalon Green Alley South and Avalon Green Alley North which are two projects identified from SLAGAMP.

Respectfully submitted,

ENRIQUE C. ZALDIVAR, Director
Bureau of Sanitation

Prepared by:
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ALLEYS AMPLIFIED

THE SOUTH LOS ANGELES GREEN ALLEY MASTER PLAN

GREENER + SAFER + SMARTER ALLEYS

Prepared for
The City of Los Angeles Bureau of Sanitation

By
The Trust for Public Land, Los Angeles
606 Studio, 2012 | Department of Landscape Architecture | College of Environmental Design California State Polytechnic University, Pomona
Council for Watershed Health

With Support From
Jefferson High School
Council District 9, Councilmember Curren D. Price, Jr.
Council Distrcit 8, Councilmember Bernard C. Parks, Jr.

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EXECUTIVE SUMMARY

PROJECT OVERVIEW

The South Los Angeles Green Alley Master Plan (the AMP) aims to redesign alleys in South Los Angeles as greener, safer, and smarter community spaces. While alleys are the central focus of the AMP, they are considered within their surrounding context of streets. Thus the AMP will propose green alleys as part of a larger network, working in concert with the streets, sidewalks, and other elements of the urban environment to provide maximum benefit to environmental and community health.

This document describes the approach taken to craft the AMP, which focuses specifically upon an 18 square mile area within South Los Angeles. With a thorough understanding of the historic and existing biophysical and social conditions of the project area, the AMP outlines a process for identifying alley segments and networks with the most potential to impact hydrologic function and water quality, urban heat island effect, park poverty, community connections, and safety. The AMP also provides a proposed phasing strategy for the project area and a collection of green alley network design options that function to meet multiple objectives. While this report focuses on just the selected high priority alley and street networks, with the right energy and resources every alley and its adjacent streets have the potential to become part of a green alley network that provides multiple community benefits.

This project was a collaboration between several groups in the Los Angeles region- City of Los Angeles Bureau of Sanitation, The Trust for Public Land, Cal Poly Pomona Graduate Department of Landscape Architecture 606 Studio, Council for Watershed Health, and Jefferson High School's Green Design Academy. Project funding was provided through the State of California Strategic Growth Council's Sustainable Communities Planning and Incentives Program.

The AMP envisions green alley networks as addressing a variety of key issues: degenerated hydrologic function, impaired water and air quality, urban heat island effect, lack of access to open space and recreation opportunities, high levels of crime, and insufficient pedestrian and bicycle infrastructure. While alleys are seemingly small spaces to address such large issues, when taken as a collective network that includes the surrounding context of streets, sidewalks, and vacant lots, they can become a web of green infrastructure that serve to catalyze wider benefits throughout the community.

The goal of the AMP is to develop redesign, maintenance, and community support solutions for alley networks in South Los Angeles. These solutions will integrate and strengthen existing planning efforts to improve local ecologies, economies, and social sustainability. Six objectives focused the efforts of the AMP: 1) air and water quality and water supply, 2) urban heat island effect, 3) open space and recreation, 4) safety, 5) walking and bicycling, and 6) education and awareness.

The AMP's purpose is to provide guidance in identifying locations where green alley networks can make the greatest positive impact, and developing potential design responses best suited to site conditions and community goals. The AMP process followed an analytic model that included primary phases of inventory, data collection, network selection, community outreach and input, and analysis. This process resulted in a hierarchy of alley networks prioritized by redevelopment and schematic opportunities. Master plans for five of these networks deemed highest priority were developed along with an extensive list of green alley design best practices. A secondary phase of outreach resulted in robust design recommendations for individual alleys within each high priority network. The AMP also offers policy and budgetary recommendations for the priority networks and project area as a whole.

PROJECT SIGNIFICANCE

The AMP has implications for the

environment, the community, and the economy of South Los Angeles. Air and water quality and climate change impacts are of major and growing concern in California. The amount of paved and built surfaces combined with the lack of an urban forest in Los Angeles contribute to the urban heat island effect and increased volumes of stormwater runoff. As surface runoff flows across urban streets, it also collects trash, oil and grease, metals, bacteria, and other pollutants. This runoff is directed through the storm drain system to the ocean, untreated, making it the leading source of ocean pollution in Southern California (City of Los Angeles Bureau of Sanitation 2009). Public right-of-ways and easements such as alleys provide opportunity areas for the construction of swales and pervious surfaces that can help improve the quality of stormwater runoff and cool the urban environment (Bureau of Sanitation 2009).

South Los Angeles is consistently ranked as one of the most impacted areas in Los Angeles County in terms of public health indicators, with high rates of sedentary lifestyles and food insecurity contributing to high rates of obesity, diabetes, and heart disease (Los Angeles County Department of Public Health 2009). South Los Angeles is also among the most park poor and income poor areas in the city with few places for safe outdoor play and recreation. On average, there is less than a half-acre of open space for every 1,000 residents in the project area. The AMP proposes to improve access to safe open spaces and parks as one way to contribute to improved health for South Los Angeles' population.

Benefits to the environment and community of South Los Angeles also lead to economic benefits. Utilizing stormwater capture and treatment best management practices (BMPs) provides savings in stormwater management costs and reduces purchased imported water through increased groundwater recharge (Harnik and Welle 2009). Increasing tree canopy and other site vegetation additionally reduces the costs associated with stormwater facilities, as well as reducing energy use, carbon emissions (Akbari 2002), and air pollutants (Harnik and Welle 2009). An improved urban forest provides additional economic benefits such as higher property values, increased consumer friendliness, and increased attractiveness for businesses to locate in the community (Bradley 1995, Dwyer, McPherson, Schroeder and Rowntree 1992, Orland, Vining, and Ebreo 1992 cited in Zhua and Zhang 2008).

PROJECT CONTEXT

The AMP has been developed for an 18 square mile portion of the South Los Angeles neighborhood of the City of Los Angeles. The project area boundaries are defined by Interstate 10 to the north, Western Avenue and Van Ness Avenue to the west, Florence Avenue and Manchester Avenue to the south, and Alameda Street and Central Avenue to the east. The area was selected because of its disproportionately high population density; poor air quality; high rates of obesity, diabetes, and heart disease; economic disadvantage; park poverty; highly impervious groundcover; low percentage of tree canopy; and high density of alleys in relation to the rest of Los Angeles City and County.

Development of South Los Angeles first surged with a real estate boom in the 1880s. Over time, the area shifted from rural ranches to suburban housing to a dense mix of single- and multi-family housing, commercial strips, and industry. It developed early as a predominately African American community and has transitioned to a Latino majority today. Alleys were originally included in neighborhoods as service routes and have long functioned as places for activities related to home maintenance, including trash collection and auto repair (Engler 1997). Over the years these alleys have seen consistent dumping of garbage, poor lighting and overgrown vegetation, limited access due to a citywide gate and lock policy (later deemed illegal), as well as other public safety issues. Today, Los Angeles lacks a coherent public policy for alleys, and ownership and responsibility is often vague and difficult to define. Currently, a four-tiered management





structure includes responsibilities held by the Bureau of Street Services, Bureau of Sanitation, Bureau of Street Lighting, and alley-adjacent residents.

A multitude of agencies, organizations, and individuals have crafted policies that shaped Los Angeles, and have contributed to the project's expertise on its ecosystems, communities, and alleys found within the region. Areas of policy and literature important to the AMP include watershed health and management, sustainable communities and green initiatives, and community plans and neighborhood planning. To provide context for watershed management policies, the AMP includes a brief summary and associated relevance for several local and regional reports, as well as for local and state ballot measures. For municipal management context, the AMP considered local and state laws, policies, and ballot measures, as well as city planning reports. The AMP also includes selected literature review summaries (full literature reviews can be found in *Appendix O*), pertaining to the topics of urban forests, the relationship between environmental design and crime, strategies for planning greenways, and human recreation in urban-residential alleys.

PROJECT PROCESS

INVENTORY + DATA COLLECTION

The analytic process model employed by the AMP project began with a rigorous look at the conditions in the project area, both past and present. Varieties of data and history were collected and examined to produce a strong picture of the project area that informed later steps of alley network prioritization, analysis, and design recommendations.

The inventory process of the AMP project area revealed a range of existing conditions that support the need for green alley networks in South Los Angeles. Biophysical conditions examined, including site geomorphology, climate, hydrology, vegetation, and wildlife, indicated degraded watershed function and health and an urban heat island effect due to widespread impervious surfaces and lack of an urban forest. A study of the project area's sociocultural settings looked at demographics, land use patterns, transportation infrastructure, community destinations and crime rates, and indicated the need for additional open space and recreational opportunities, increased safety and perceptions of safety, improved infrastructure for walking and bicycling, and opportunities to increase the quality of life for residents of the AMP project area. AMPlified networks of alleys, streets, and vacant lots hold the potential to address all of these.

PRIORITY NETWORK SELECTION

Network selection analysis revealed the alley networks that are the most suitable for redevelopment and will result in the greatest benefits. Models were developed to examine four issues: quantity of stormwater runoff, stormwater pollutants, park poverty, and community connections. After the models were developed, they were used to analyze all of the 68 possible alley networks within the project area. This involved scoring, ranking, and sorting the networks to select those that had the potential for the greatest positive impacts. After groundtruthing fifteen networks from the selection results and reviewing them with the project team, six high priority networks were selected. These six networks- Western-MLK, Vermont Square, Quincy Jones, Central-Jefferson High, Broadway-75th, and the Avalon Green Alley Demonstration Project- are the first networks within which the AMP recommends implementing green alley infrastructure.

COMMUNITY OUTREACH + INPUT

The AMP team reached out to the project client, stakeholders, and community to uncover a vision of what the future could be for South Los Angeles alleys. Through this process, input from city agencies, non-profit and private entities, stakeholders, and the community (residents, employees, and visitors of the project area) was integrated into the development of the AMP by guiding the project goals and objectives as well as highlighting anticipated benefits from the green alley networks. Feedback was also used to hone design and policy recommendations.

Community outreach involved a two-phase approach, once at the AMP project regional scale, and again at the individual network scale. Results from the outreach process identified twelve key categories of green alley infrastructure strategies that include themes of: stormwater treatment and infiltration, increased recreation and

community involvement opportunities, non-vehicular transportation connections, enhanced public safety, and urban beautification. A more detailed list of these key infrastucture elements can be found in the *Program Categories* section of *Chapter 5*. These design responses respond to the needs of city agencies, non-profit and private entities, stakeholders, and the community based upon expressed perceptions, desires, and recommendations.

PROJECT AREA ANALYSIS

The analysis phase of the AMP integrated information gathered during the previous project stages. It combined the most relevant existing conditions (identified through the project area inventory) with the key green alley infrastructure strategies (determined through outreach and input) to identify the most salient issues, opportunities, and constraints to the project.

Some of the issues identified through this process have been echoed in other phases of the AMP project and include: degenerated hydrologic function; impaired air and water quality; urban heat island effect; lack of access to open space and recreation opportunities; high levels of crime; and insufficient pedestrian and bicycle infrastructure. The AMP goals and objectives guide green alley network solutions that address these issues.

The alleys, streets, sidewalks, and vacant lots of South Los Angeles possess tremendous potential to catalyze improvements in the physical and social environment of the region. AMP opportunities are found in the conditions that may facilitate the development and implementation, and/or the long-term success, of green alley network projects. They may also provide a unique condition that complements green alley infrastructure. Examples of opportunities identified in the project area analysis would be the potential to treat stormwater runoff from streets through BMPs in adjacent green alleys, or wide streets and open parkways that could provide space for plantings and street trees.

Opposite to this are constraints that restrict the effectiveness of future green alley network improvements, or inhibit their development and implementation. Examples of identified constraints include regulations that confine infiltration BMPs to locations that are at least ten feet above groundwater and ten feet away from building foundations as well as perceptions of danger that inhibit people from using alleys and other public open spaces.

PRIORITY NETWORK ANALYSIS

Additional inventory and analysis, focused at a network specific scale, revealed the best design strategies for alleys and streets within five of the six identified high priority alley networks. The Avalon Green Alley Demonstration Project, one of the originally identified high priority networks, was slated for implementation at the time of this phase of the project and was not included in this level of analysis due to previously developed conceptual designs. This local scale analysis process lead to the identification of issues, opportunities, constraints, and priorities for each individual high priority network.

The alleys in the five networks were analyzed for their suitability to support four categories of function related to the project objectives: stormwater capture and treatment; urban greening and cooling; usable open space; and safe connections. The network analysis allowed for the consideration of how alleys and streets within each of the networks could work together to serve the project objectives. Each network contains numerous opportunities and constraints, which together shape the priorities for the network. *Chapter 6: Priority Network Analysis* contains analysis maps and text that describe the opportunities, constraints, and issues for the Western-MLK, Vermont Square, Quincy Jones, Central-Jefferson High, and Broadway-75th Networks. A summary of their priorities includes:

Western-MLK Network

Redevelop the alleys and streets immediately adjacent to commercial areas and those able to capture and treat stormwater runoff, provide safe pedestrian and bicyclist connections, and mitigate the urban heat island effect.

Vermont Square Network

Reduce collisions between pedestrians or bicyclists and vehicles through improved pedestrian and bike safety infrastructure, and involve the youth population during the outreach process.





Quincy Jones Network
Utilize green alleys and streets to address high pollutant levels in, and volumes of, stormwater runoff from the bordering industrial zone, and work with neighbors to create community connections and recreational open space within alleys.

Central-Jefferson High Network
Improve pedestrian and bicycle infrastructure to protect and support the high volume of pedestrian and bicyclist traffic in this network, and develop alleys as safe and direct connections to community destinations.

Broadway-75th Network
Create new and safe open spaces and recreation opportunities to alleviate the extremely poor access to parks and recreation opportunities in this neighborhood, and mitigate the air pollution from the Harbor Freeway.

GREEN ALLEY NETWORK DESIGN

This master plan provides the basis for network scale design themes and features for each of the priority networks identified. In addition, the structure to support further community engagement processes is outlined. As the design for individual alleys moves forward, the community should continue to be engaged in the process and be provided with the opportunity to influence more detailed design decisions. Included in this document are the *Alley Development Alternatives (Appendix A)*- an assemblage of possible design responses that could amplify the function of green alley networks. Design responses are categorized according to the same four primary functions utilized in the network analyses, which are tied directly to the project objectives: stormwater capture and treatment; urban greening and cooling; usable open space; and safe connections. This organization allows planners, stakeholders and community members to easily select the design responses that will best meet the project's objectives while also serving the functions that a particular alley can and should support, as determined in the network analysis. Design responses are also included for streets and vacant lots.

Chapter 8: Green Alley Network Planning + Design, provides network master plans illustrating street and open space improvements, design themes and priorities, and an alley by alley design guide for each of the priority networks. As time progresses and conditions within the priority networks change, alternate design responses can be selected from *Alley Development Alternatives (Appendix A)* and adapted as needed, lending flexibility to green alley network projects.

NEXT STEPS

MASTER PLAN PHASING

This AMP includes a process for analyzing the project area conditions in order to identify the networks with the greatest potential for positively impacting issues related to stormwater runoff volume and quality, park poverty, and community connections (see *Chapter 4: Green Alley Network Selection*). This process identified six high priority networks to be redeveloped as Phase I of the AMP implementation. One of those networks, the Avalon Green Alley Network, is currently a demonstration project headed by The Trust for Public Land. The other five high priority networks- Western-MLK, Vermont Square, Quincy Jones, Central-Jefferson High, and Broadway-75th- should be the next areas of focus for green alley network development.

Once the visions for green alley networks have been realized for these six networks, the work of the AMP is not over. The City of Los Angeles will benefit from a citywide collection of green alley networks working together to distribute their benefits throughout the wider area. The next phase of green alley networks to be redeveloped should include the networks that have the next greatest potential for resulting in multiple benefits. The AMP identifies six Phase II networks that provide the best combination of multiple benefits. These are Networks 34, 59, 6, 27, 56, and 49. After the second phase of green alley networks are completed, green alley redevelopment should continue on to Phase III, with the next set of networks that can provide multiple benefits. At that time, the AMP recommends reassessing the project area conditions to ensure the selection model is still relevant.

MONITORING PLAN for NETWORK EVALUATION

Green alley network design is a relatively new venture, and therefore few studies exist on the quantitative and qualitative benefits that result from them. The AMP recommends monitoring indicators in order to contribute to the body

of knowledge regarding landscape performance. *Appendix D: Sustainability Indicators and Predicted Performance Tables* includes tables that organize green alley indicators, desired outcomes, and measurement methods recommended by the AMP to measure the performance of green alley networks. Once designs have been developed for the networks and the specific elements for implementation have been decided upon, more specific evaluation plans that include predicted performance for each design response should be developed.

COMMUNITY INVOLVEMENT

While many green infrastructure design responses require a certain level of invested capital and expertise to implement, there are many preliminary measures that residents themselves can undertake immediately with little more than a few supplies and dedication of time and energy. The *Next Steps* section of *Chapter 9* provides examples of some of these immediate actions that community members can take to begin the transformation of their neighborhood alleys.

As implementation of green alley networks progresses, the AMP strongly suggests that the local community be involved to the greatest extent possible in these projects, particularly by utilizing local materials and providing local jobs. In addition, suggested topics for future outreach activities are provided in *Chapter 8: Network Planning + Design*, with recommendations for each high priority alley network outlined.

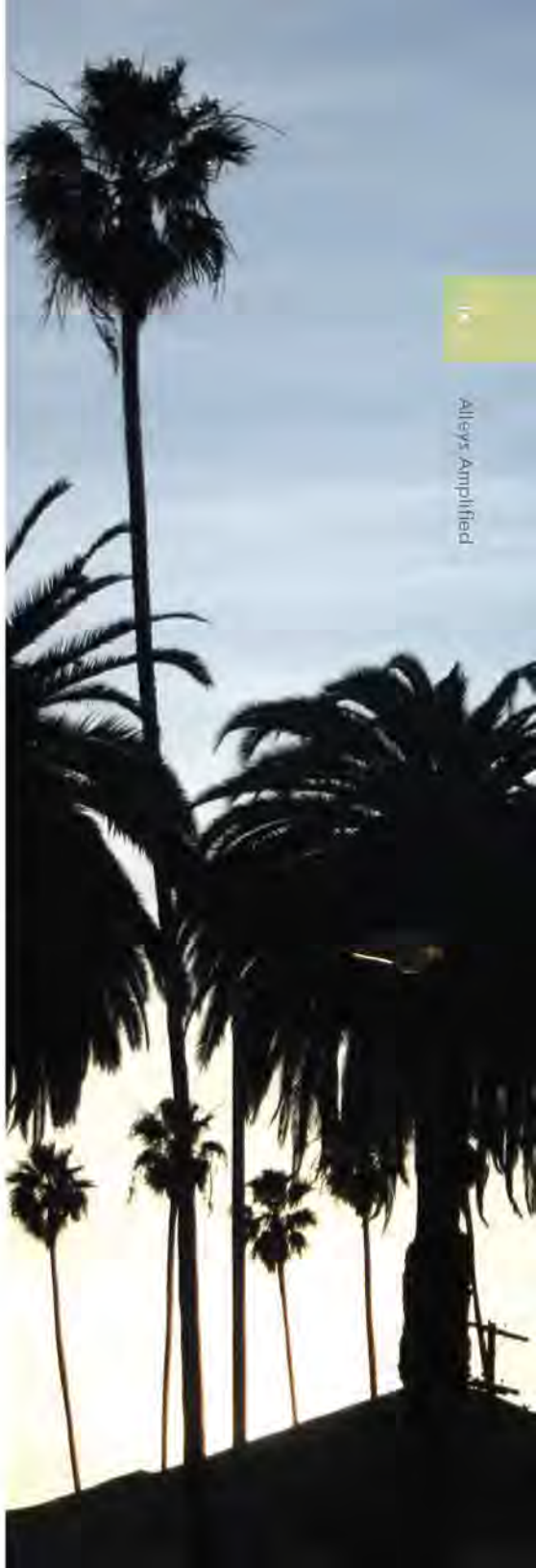
AMP BENEFITS

Through the implementation of the AMP, the alleys within this project will be transformed in phases into greener usable open space, safer connections to community destinations, and smarter green infrastructure and low-impact development. The AMP can have great impact on many issues and challenges that face South Los Angeles, including the treatment of polluted stormwater runoff, the expansion of limited open spaces, and the addition of new community resources.

Alleys within the project area represent 252 acres of opportunities for the communities of South Los Angeles. This collection of spaces can allow groundwater to recharge through infiltration and can reduce the pollutants in stormwater runoff through filtration. Every dollar invested in green infrastructure construction has direct financial impact through its associated reduction in the annual costs of treating water pollution and maintaining the large existing stormwater infrastructure. The AMP project area also presents an opportunity to mitigate the urban heat island that results from extensive development and lack of an urban forest throughout the region. Tree planting, as recommended by the AMP, not only remediates the urban heat island, but also increases rain capture, air quality, and biodiversity, reduces wind speeds and ozone concentrations, improves soil quality (Nowak, Stein, Randler, Greenfield, Comas, Carr and Alig 2010), and reduces energy use and carbon emissions (Akbari 2002).

The alleys of South Los Angeles have often been seen as challenges and constraints to neighborhood improvement and revitalization efforts, given their frequently polluted and neglected status. However, in the present-day context of high-density neighborhoods in need of pedestrian and bicycle infrastructure, alleys today should be seen as opportunities to initiate complete street renovations for a network of activated public spaces including streets, alleys, and sidewalks.

The 252 acres of alleys within the project area have a combined acreage greater than the sum of the area's park space. Recent public health data strongly indicates the need for improvements to all aspects of the project area's public health infrastructure, including open space access and reduced air pollution. The distribution of park space within the project area currently averages less than half an acre for every 1,000 residents, about one-fifteenth the City average for Los Angeles. This project demonstrates both how and why these hidden spaces are resources that can supplement and complement large, formal, open spaces.





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INTRODUCTION

1. INTRODUCTION

1-A. PROJECT OVERVIEW



FIGURE 1.1
A TEEN WALKING IN THE CENTRAL-ALAMEDA NEIGHBORHOOD OF SOUTH LOS ANGELES

Alley redevelopment is taking place in various forms across the United States, in cities such as Chicago, Seattle, Austin, and Los Angeles. Cities are turning to alleys as opportunities to address stormwater management, economic revitalization, climate change mitigation, and community health. The South Los Angeles Green Alley Master Plan (AMP) aims to redesign alleys in South Los Angeles as greener, safer, and smarter community spaces. While alleys are the central focus of the AMP, they are inseparable from their surrounding urban context. Thus the AMP regards green alleys as part of a larger network, working in concert with the streets, sidewalks, and other elements of the urban environment to provide maximum benefit to environmental and community health.

South Los Angeles does not have a well-agreed upon, defined boundary. Therefore, this project started with an area in South Los Angeles that is park-poor, highly impervious, with a low percentage of tree canopy, and a high density of alleys. A study of the proposed project area's existing conditions and surrounding context provides more detail concerning the disadvantages facing South Los Angeles (refer to the Project Area Context and Inventory, Chapters 2 and 3). For cities that do not have clearly disadvantaged areas, a more extensive regional scale examination and analysis of conditions should first be conducted to identify the ideal area on which to focus for green alley networks.

The next step is identifying where more dedicated attention and resources should first be focused within that general area of concern and determining what green alley strategy is most appropriate for each site. Addressing these problems is the main concern of the AMP.

The AMP focuses specifically on an 18 square mile area within South Los Angeles. With a thorough understanding of the historic and existing biophysical and social conditions of the project area, the AMP outlines a process for identifying alley segments and networks with the most potential to impact hydrologic function and water quality, urban heat island effect, park poverty, community connections, and safety. While opportunities and priorities within identified high-priority networks are outlined and a vision of their potential is illustrated, extensive community outreach conducted in the high-priority networks, guides recommended design interventions and aesthetics. Each network's design recommendations includes a plan for overall street and community improvements. Suggested implementation phases or tiers within the networks are presented along with specific performance evaluation strategies and predicted benefits. Research on policy implications and recommended policy changes that facilitate green alley network development are presented. Finally, the AMP provides a proposed phasing strategy for future potential networks in the project area.

A number of tools for alley redevelopment are presented as a part of the AMP. For example, the Alley Development Alternatives (Appendix A) is an extensive table that proposes design solutions that function to meet multiple objectives. It can be used as a guide for agencies to complete green alley projects that are multi-benefit. In addition, many of the outreach activities can be replicated and suggestions for their use are included. While the AMP focuses on just the selected high priority alley and street networks, with the right community and municipal energy, resources, and policies, every alley and its adjacent streets have the potential to become part of a green alley network that provides multiple community benefits.

SUMMARY OF ISSUES

The AMP envisions green alley networks as addressing a variety of key issues. These issues are further discussed in the Project Area Analysis chapter (Chapter 5) and include:

- Degenerated hydrologic function
- Impaired water quality
- Urban heat island effect
- Impaired air quality
- Lack of access to open space and recreation opportunities
- High levels of crime
- Insufficient pedestrian and bicycle infrastructure

These issues impact the quality of life within South Los Angeles, and the ecological health of the region. Pollution, insufficient community resources and infrastructure, and low levels of safety inhibit residents from using the resources that do exist in their community and also increase dependence on the personal automobile. This leads to higher levels of pollution and social isolation. The developed urban environment has high percentages of hard surfaces, low percentages of unpaved open space, and a sparse tree canopy. This intensifies the urban heat island, leads to poor air quality, and impairs groundwater recharge and surface water quality. These effects extend beyond the social boundaries of South Los Angeles to contribute to regional air and water quality degradation. While alleys are seemingly small spaces to address such large issues, when taken as a collective network that includes the surrounding context of streets, sidewalks, and vacant lots, they can become a web of green infrastructure that will serve to catalyze wider benefits throughout the community.

GOAL

The guiding goal of the AMP is to develop solutions for the redesign, maintenance, and community support of alley networks in South Los Angeles that will integrate and strengthen existing planning efforts to improve local ecologies, economies, and social sustainability.

OBJECTIVES

In order to address the issues identified in this plan, the objectives of the AMP aim to update local infrastructure in order to:

Protect and improve water supply and air and water quality.

- Maximize opportunities for runoff capture and groundwater recharge in alley and adjacent street infrastructure.
- Improve quality of stormwater runoff.
- Incorporate and promote watershed education in alley design solutions.
- Support objectives of other local watershed management plans.
- Coordinate with other ongoing street improvement projects.
- Increase urban tree canopy.
- Reduce vehicular use and promote alternative transportation.

Encourage walking and bicycling through improved regional, local, and neighborhood connections.

- Increase pedestrian and bicyclist comfort.
- Ensure availability of proper public amenities for pedestrians and bicyclists.
- Increase connectivity between public spaces, public transportation, and residences.
- Develop and connect new green alley networks to existing pedestrian or bicycle networks.

Reduce urban heat island effects.

- Increase urban tree canopy and living surfaces.
- Increase the albedo of paved surfaces.
- Increase human comfort by providing a balance of sun and shade for outdoor spaces.

Increase access to and quality of open space and recreation opportunities.

- Increase accessibility of existing open space, including alleys.
- Expand and improve pedestrian and bicyclist connections among existing and planned open spaces.
- Identify opportunities for public open space.
- Add recreation space in neighborhoods with the most need.

Make alleys safe places for the people who use them and the neighbors who live beside them.

- Reduce violent crime and property crime occurrences in alleys.
- Improve visibility within alleys.
- Reduce conflicts between drivers, bicyclists, and pedestrians within and near alleys.
- Reduce illegal dumping and vandalism within and near alleys.

Promote education and awareness of green alley network infrastructure.

- Increase visibility of green alley networks.
- Convey information regarding green alley network functions to residents and alley network visitors.
- Design spaces appropriate for local users and to meet local needs.
- Create opportunities for community participation and stewardship.

AVALON GREEN ALLEY DEMONSTRATION PROJECT

Project Lead:
The Trust for Public Land

Timeline:
Funding secured in 2010
2010-2011: research, analysis, community outreach, and conceptual network design development
2012: community outreach, schematic alley designs, and construction documents
2015: construction on Tier 1 alleys







The Avalon Green Alley Demonstration Project is located in the South Park neighborhood of Los Angeles. The demonstration project area consists of six alleys bounded by 51st Street to the north, Avalon Boulevard to the east, 55th Street to the south, and Main Street to the west. These alleys were chosen because they provide direct connections to two schools, two parks, and a grocery store. The goals of the project are to: 1) improve community health and fitness, 2) improve water quality and supply, 3) increase safety, 4) provide neighborhood connections, and 5) green and cool the urban matrix. The project includes inventory and analysis of existing conditions of the alleys, streets and sidewalks within the network, and extensive community outreach to determine the concerns and needs of the residents and to build a base of support for the green alley network. The Trust for Public Land developed a network plan that emphasizes two tiers of alley development. Designs for two Tier 1 alleys will include lights, art, entrance features, traffic calming, vines, decorative permeable paving, and directional signage; four Tier 2 alleys will receive lights, vines, and signage as funding permits. New street trees will provide additional benefits to the neighborhood. As of 2015, construction will begin on the Tier 1 alleys while community events continue to build support for the project.





The City of Los Angeles has approximately 6,500 miles of paved streets, 10,000 miles of sidewalks, 900 linear miles of alleys, and 34,000 catch basins (City of Los Angeles Department of Public Works Bureau of Sanitation 2009). Los Angeles alleys alone have a combined total area of about three square miles, which is twice the size of New York's Central Park and about half the size of Griffith Park (Figure 1.2). Although individually alleys are relatively small spaces, collectively when combined with streets and sidewalks they provide ample capacity to integrate green infrastructure to improve environmental and community health in neighborhoods which do not have undeveloped land. As described by the U.S. Environmental Protection Agency, green infrastructure is a combination of natural spaces that can be utilized to address a wide variety of ecological and societal issues (Miller and Hobbs 2002, Mell and Roe 2007, Mell 2008). Green alleys are a unique form of green infrastructure as they have the environmental benefits of green streets (through the absorption of water), the social benefits of parks (as they serve as social, recreation spaces), and the health benefits of trails (since they provide connections to destinations and safe travel alternatives).

Through the implementation of the AMP, streets and alleys within the project area will be gradually developed into greener, safer, and smarter networks that include usable open space, safe connections to community destinations, and low-impact infrastructure. Simple interventions can add vegetation, cool the microclimate, increase visibility, and make alleys more livable and efficient. The many and diverse benefits provided by high-performance landscapes make projects like the AMP not only worthwhile, but invaluable to the communities they serve.

Communities throughout the United States are investing in green infrastructure projects such as green alleys and streets in order to realize benefits that include stormwater management, improved community gathering opportunities, and increased public safety. The programs vary based on topographical, demographic and community needs. Chicago, with nearly 2,000 miles of alleyways, was one of the first communities to develop a green alley program on a large scale, and since 2006, has installed more than 100 green alleys in a variety of neighborhoods with quantifiable success. Cities in at least ten states followed suit with their own unique green alley and street programs. Communities at the vanguard of this movement towards greener infrastructure can provide helpful data and best practices for communities interested in taking a more active approach to managing stormwater or improving community quality-of-life through the development of green alleys.

COMMUNITY HEALTH

The project area has a total population of just over 338,000 persons occupying just 18 square miles (US Census 2010). As a comparison, the City of Oakland has approximately 390,000 persons distributed throughout its 56 square miles (US Census 2010) (Figure 1.3). Compounding this urban density in the project area is a severe lack of parks and open spaces. While Oakland residents enjoy over 3,000 acres of parks and open space (7.7 acres per 1,000 residents) (Oakland Parks Coalition n.d.), on average in the project area there is less than a half-acre of open space for every 1,000 residents, for a total of 164 acres. Alleys in this same area total 252 acres and are an opportunity to more than double the public open space available to this underserved area (Figure 1.4).

The alleys within the project area alone have a combined acreage greater than the sum of its park space and these hidden spaces are resources that can supplement and complement large, formal open spaces. The area's few



FIGURE 1.2
PARKS AND ALLEYS SIZE COMPARISON

existing parks are mostly large parks oriented towards formal recreation. South Los Angeles lacks mini-parks and community gardens, precisely the type of open spaces made possible by this project. Within Los Angeles County's South Service Planning Area (SPA 6), of which the project area is a part, 24% of adults say there are no safe places to be physically active in their neighborhood, including sidewalks and streets for walking or jogging (Los Angeles County Department of Public Health 2009) and 37% of children in the planning area lack easy access to a park, playground, or other safe place to play (Los Angeles County Department of Public Health 2009).

The AMP provides an opportunity to address the imbalance between the amount of park space in low-income, minority, and immigrant neighborhoods and those of more affluent regions, an inequitable pattern which occurs both in Los Angeles and across the United States (Sherer 2005). South Los Angeles is among the most park poor and income poor areas in the city with 1.2 acres of green space and recreation areas per 1,000 population compared to 70.1 acres in West Los Angeles and 0.42 miles of county bicycle lanes per 100,000 population compared to 1.92 miles in West Los Angeles (Community Health Councils, Inc. 2008).

The Los Angeles County Department of Public Health suggests, "we must not only improve access to health care and expand health education and outreach, but ameliorate poor environmental conditions through informed public policy and land use modification" (Los Angeles County Department of Public Health 2009, p. 4). According to the most recent South Los Angeles Health Equity Scorecard, residents of South Los Angeles tend to be "disproportionately disadvantaged and harmed by inequities in the…physical resource environments," and in particular are lacking physical activity options (Community Health Councils, Inc. 2008). Within Los Angeles County, South Los Angeles has the highest incidence rates for heart disease, stroke, adult obesity, childhood obesity, and diabetes (Los Angeles County Department of Public Health 2009, Park et al. 2008). Attractive, safe, and functional streets, alleys, and public spaces not only allow habitual motorists to walk and bicycle for shorter trips, but also encourage children to spend more time playing outdoors. Increasing access to safe open spaces and parks is one of the most direct financial benefits to public health.

Furthermore, these alleys can provide added benefits through the provision of places for (and encouragement of) recreation and active transportation (automotive alternatives), contact with nature, and public places for civic activity and cultural identity. While public parks can also provide these benefits, alley conversions can be essential in dense and built-out urban areas where new park space is limited.

Crime Reduction

The City and residents have worked together in the past to address illegal behavior in alleys, most notably through the popular Alley Abatement Program of the 1990s, which gated alleys in order to reduce crime. The strategy was later deemed illegal, leaving citizens and policy-makers looking for the types of comprehensive analysis and solutions provided within the AMP. Redesigned, safer spaces directly benefit community policing efforts and reduce their costs. This is especially true for spaces designed with a community design process. The creation of new activated public spaces with clear community support is a visible way to show that changes are being made for the benefit of the community. While the perception of danger and nuisance in Los Angeles alleys is greater than actual observed



FIGURE 1.3
OAKLAND AND THE AMP PROJECT AREA:
A COMPARISON OF PEOPLE AND PARKS

incidents (Wolch, Reynolds, Longcore, and Devinny 2009), increased perception of safety increases usership and therefore actual safety, and vice versa. Thus the creation of safety creates self-supporting change.

Community outreach for the AMP determined that citizens' main alley concerns relate to litter, unsafe conditions resulting from poor maintenance, and poor lighting, all of which can be addressed through design guidelines and community collaboration. Not surprisingly, the project inventory found that those alleys which show signs of care and ownership attracted less illegal and nuisance behavior. Crime prevention research has found that community participation in redevelopment efforts allows residents to assert control by setting behavioral norms (Newman 1972). In addition, a British study found that crime rates decrease not only in neighborhoods with improved lighting, but also in adjacent areas, demonstrating the cost effectiveness of each new street light. A comparison of costs showed that savings from the reduced crime more than paid for the cost of lighting (Painter and Farrington 2001). Well lighted areas in good condition deter crime by indicating social cohesion and informal social control (Beard 2010, Cozens, Saville, and Hillier 2005, Nassauer 1995, Wilson and Kelling 1982), but the best way to increase effective site surveillance is to create livable and attractive spaces where people feel comfortable spending time (Newman 1972, Jacobs 1961). As reductions in crime are associated with increased property values, increased production, reduced opportunity costs, reduced public health costs, increased willingness of businesses to relocate, and increased community investment (Hellman and Naroff 1979), green alley projects can serve as a catlyst for change across a neighborhood.

As violent crime has dropped dramatically over the past 20 years in Los Angeles, community participation at schools, churches, recreation centers, and public youth activities such as former Mayor Villaraigosa's "Summer Night Lights" active recreation and gang reduction program, continues to increase. Research has shown that local after-school recreation opportunities will further prevent juvenile crime (Jamieson and Ross 2007, Welsh and Hoshi 2002, Schinke, Orlandi, and Cole 1992). Public spaces are well-used, integral parts of the community. The AMP draws upon existing community networks by involving residents and encouraging participation in the crafting and renewal of their streets and alleys.

Transportation Benefits

One in four workers commutes by public transit, bicycling, walking, or a combination thereof (US Census 2009). The project area population, with its limited vehicular mobility, is the target



FIGURE 1.4
ACRES OF PARKS AND ALLEYS IN THE AMP PROJECT AREA

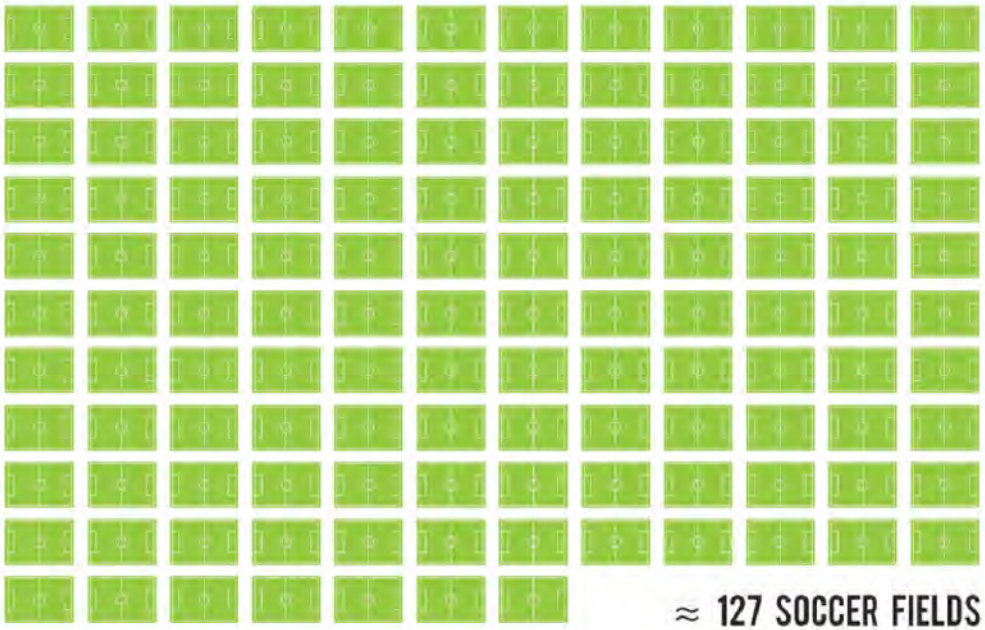


FIGURE 1.5
HOW BIG IS 252 ACRES?



25 ACRES OF NEW RECREATION OPPORTUNITIES COULD RESULT IN A **22% INCREASE** OVER SOUTH L.A.'S CURRENT PARK CONDITIONS

FIGURE 1.6
SIDEWALK VENDORS ADJACENT TO GILBERT LINDSAY PARK

demographic for projects that improve the safety, usability, connectivity, and livability of public streets and alleys. Over 18,000 project area workers live in households without a car, or 12% of residents in the project area as compared to 7% of the City of Los Angeles population. One in three residents in the project area is under the age of 18, a demographic that utilizes alternative transportation at much higher rates than the rest of the population. In addition, residents 18 years and younger currently use sidewalks and alleys as their primary transportation routes, and as playgrounds and functional backyards. It is no wonder that project area residents have shown such enthusiasm for efforts aimed at planting, cleaning, and redesigning their streets and alleys, a message that has been consistent throughout the focus groups, surveys, presentations and conversations included in this study.

A national movement in support of streets designed for all users (pedestrians, bicyclists, motorists, and transit riders of all ages and abilities), known as complete streets or livable streets, is growing. Los Angeles County adopted the *2011 Model Design Manual for Living Streets* and an annual conference held in Los Angeles focused on complete streets. Simultaneously, bicycling is increasing in popularity in Los Angeles, as evidenced by events such as the annual CicLAvia bicycle and street fair.

The need for change is clear. California ranks third nationally for pedestrian deaths among older adults, with Latino and African American residents facing a much greater risk of death than Caucasian residents (McCann, Meyer, Woods, and Morfas 2012).

Given that the planning area covered by the AMP is among the densest in the city and is projected to grow in population, South Los Angeles is an ideal target for complete streets and alley improvements because each project will create greater community impact than anywhere else in the city. Public streetscape and alley-scape projects here also create amplified impacts because of the area's severe lack of open spaces.

The alleys of South Los Angeles have typically been seen as constraints to neighborhood improvement and revitalization efforts, given their often neglected condition. However, in the present context of high-density neighborhoods in need of pedestrian and bicycle infrastructure, alleys should be seen as opportunities for initiating complete street renovations in creation of beneficial networks of connected public spaces, including streets, alleys, and sidewalks.

Enthusiasm and optimism have greeted recent infrastructure improvements such as the South Los Angeles Wetland Park, mixed-use buildings along Central Avenue, the new Expo Metro line, and the many new Los Angeles Unified School District schools. The municipal and state resources that have been allocated for these projects show that civic leaders understand the important role that South Los Angeles will play in the City's future because of its dense and diverse multicultural population. Involvement of the local community increases the probability of creating local jobs, and the use of local materials further benefits the local economy, while helping communities to establish identity and sense of place.

The unique spatial pattern of alley and street networks in South Los Angeles have the potential for a critical mass of small design interventions to restore ecosystem function and create community cohesion (Maltzan 2011). The AMP ensures that those networks shown in detail have significant potential to expand the area's limited open space and to create new community resources in which every alley and street can provide multiple community benefits and create a sense of place.

Economic Impacts of Community Health

Projects in the densest neighborhoods, such as South Los Angeles, have greater impact and greater cost-effectiveness than similar projects would in less populated areas. Investment impacts are also disproportionate because of the severe existing conditions for open space and urban tree canopy. The project area has room for approximately 30,000 new street trees, which would encourage higher real estate prices, increase consumer friendliness, lower energy bills, attract businesses (Bradley 1995, Dwyer, McPherson, Schroeder and Rowntree 1992, Orland, Vining,

and Ebreo 1992 cited in Zhua and Zhang 2008), and reduce crime (McPherson, Simpson, Xiao, and Wu 2011, Nowak et al 2010, and Manning 2008). Crime reduction reduces public health costs and increases property values, the willingness of businesses to relocate into an area, and community investment (Hellman and Naroff 1979).

The Los Angeles County Department of Public Health has taken the approach that an effective and efficient way to improve public health is through the improvement of our physical environment and infrastructure, and to that end the County now publishes a manual for the design of healthier "living streets" (Los Angeles County 2011, Los Angeles County Department of Public Health 2009, Frank, Engelke, and Schmid 2003, Harpham and Tanner 1995).

Open space provides direct economic benefits through decreased public health and policing costs, and increased property values (Harnik and Welle 2009, Sherer 2005). 'Willingness to pay' models have evaluated the value of direct use of open space by assigning monetary value to the savings afforded to the public by the use of space for which they would otherwise have to pay, such as gym membership fees for recreation (Harnik and Welle 2009).Beyond the direct benefits, open space provides natural capital in the form of clean air and water, and social capital through increased volunteer civic engagement, community investment, and stewardship.

A study by the University of Southern California found that the purchase of nearby land for a pocket park would be recouped within 15 years through property tax increases alone (Pincetl, Wolch, Wilson, and Longcore 2003). The AMP will enjoy these benefits of increased property taxes without the requirement to locate and purchase suitable land. Project costs can instead be invested directly into site improvements.

The positive effect of open space on property values has been shown in both affluent suburban and low-income immigrant neighborhoods, and proximity to open space can have a greater effect on property value than any other factor including lot size (Pincetl et al. 2003). Proximity to open space has been cited as a key factor in the location of new businesses for small business owners (Crompton et al. 1997 cited in Acheson et al. 2011).

The AMP aims to redesign alleys in South Los Angeles as greener, safer, and smarter community spaces. Simple interventions can add vegetation and cool the environment, increase visibility and make alleys more inviting, and update the efficiency of their infrastructure. Alleys presently comprise a unique spatial pattern in the landscape: one with the potential to create a critical mass of smaller design interventions (Maltzan 2011) that work towards rehabilitating both ecosystem function and community cohesion.

One question left unanswered by the 2003 University of Southern California park study was the level of gentrification created by such new parks. Because alleys are places used almost entirely by local residents, there is minimal chance of improvements leading to large demographic changes. Street and alley improvements augment existing architectural and site character, therefore rarely do such developments present conflicts of site preservation. Furthermore, the dilemma of gentrification is much less of a concern for small, activated spaces in which a sense of ownership, pride, and stewardship is fostered (Rasmussen Cancian 2003).

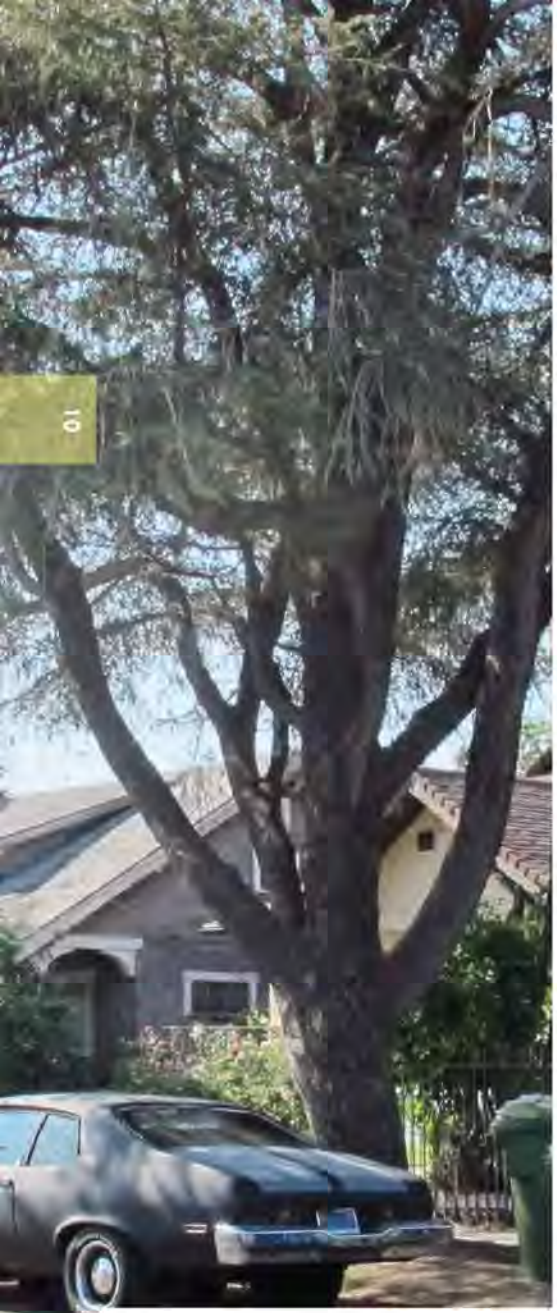
Expensive site designs are not necessary to gain the many benefits of open space. The most cost effective investment in South Los Angeles may very well be a tree. Residential and commercial street planter strips within the project area alone have room for approximately 30,000 new street trees, which encourage higher real estate prices, increase neighborhood friendliness, lower energy bills, and attract businesses (Bradley 1995, Dwyer et al. 1992, Orland et al. 1992 cited in Zhua and Zhang 2008), which in turn drive new community dynamics (Clark, Lloyd, Wong, and Jain 2002 cited in Zhua and Zhang 2008). Urban forestry has also been shown to improve physical and mental wellbeing, increase use of existing open space, boost neighborhood satisfaction (Oleyaret al. 2008), reduce crime, and expand a sense of ownership (McPherson et al. 2011, Nowak et al. 2010, Manning 2008).



FIGURE 1.7
ALLEY IN WESTERN-MLK NETWORK

250 ACRES OF ACCESSIBLE OPEN SPACE COULD BE GAINED THROUGH PROJECT IMPLEMENTATION





30,000 NEW STREET **TREES** WOULD REMOVE **740 TONS OF CO_2** EACH YEAR

FIGURE 1.8
STREET VEGETATION IN WESTERN-MLK NETWORK

ENVIRONMENTAL HEALTH

Air quality, water quality, and climate change are major concerns in California. California's urban centers have been warming faster than the rest of the state, and Los Angeles in particular has warmer average temperatures, and more and longer heat waves than a century ago (Tamrazian, LaDochy, Willis, and Patzert 2008). The amount of paved and built surfaces, combined with the lack of an urban forest in Los Angeles, contribute to the urban heat island effect, which traps heat, retains solar heating longer, and increases rainfall downwind (US EPA 2011a, National Aeronautics and Space Administration 2002). Additionally, surface runoff water is warmer, which increases the temperature of receiving waters and stresses aquatic species (US EPA 2011b).

In Los Angeles, water has traditionally been viewed as a potential risk and something to be 'dealt with.' Engineered systems ('grey infrastructure') are implemented in order to dependably protect cities from natural events and provide services, and this often requires that multiple projects are undertaken to address issues separately (Wolf 2003). This includes constructing separate stormwater drainage systems, channelizing rivers, or pursing conservation goals on a parcel-by-parcel basis (McDonald, Allen, Benedict, and O'Connor n.d.). However, research has established that using networks of living systems –the green infrastructure approach – can leverage land to achieve diverse benefits as successfully as grey systems (Kollin 2007 and Mell 2008).

As surface runoff flows across urban streets, it collects trash, oil and grease, metals, bacteria, and other pollutants. It is directed through the storm drain system to the ocean, untreated, making it the leading source of ocean pollution in Southern California (City of Los Angeles Bureau of Sanitation 2009). The alleys of South Los Angeles are consistently treated as communal dumpsters – many are plagued by illegal dumping, human and animal excrement, and decaying, dead animals. They are also commonly used for vehicle maintenance, making them subject to oil and other chemical leaks and spills. Therefore, by placing stormwater infrastructure improvements in alleys – often the most highly polluted places in the community – the AMP will significantly improve the quality of stormwater runoff.

Public right-of-ways and easements such as alleys provide large opportunity areas for the construction of swales and pervious surfaces (mainly through capture, filtration, and storage), that can help improve the quality of stormwater runoff and protect against floods (City of Los Angeles Department of Public Works Bureau of Sanitation 2009). If every alley within the project area were retrofitted to just infiltrate the precipitation that falls upon its surface, 250 acre feet of water would be removed from the municipal storm drain system each year. If each of those alleys also captured and treated runoff from adjacent rooftops and parking lots, the volume of treated stormwater would be significantly higher.

Furthermore, implementing green infrastructure in alleys helps to maintain or improve good air quality, provide habitat, increase carbon sequestration, mitigate heat island effect, and reduce air pollution (U.S. Environmental Protection Agency 2013, McMahon 2000, Beatley 2000, Gill, Handley, Ennos, and Pauleit 2007). Incorporating Low Impact Development (LID) Best Management Practices (BMPs) in the alleys of South Los Angeles affords opportunities to improve environmental health.

In addition, green street and alley design elements tend to reduce reliance on traditional gray infrastructure. Moreover, while Los Angeles "regularly faces water shortages and does not generate enough water to sustain itself," installing green infrastructure can address both water quantity and quality problems. Green alleys can help provide water savings, avoid expensive water treatment, strengthen urban resilience, and provide overall urban change adaptability and mitigation (Ulrich 1986, Jackson 2003, Colding 2007, Gill, Handley, Ennos, and Pauleit 2007, Vos, Berry, Opdam, Baveco, Nijhof, O'Hanley, Bell, and Kuipers 2008).

Economic Impacts of Environmental Health

Significant costs are required for storm drain system maintenance, trash removal, and compliance with water

quality regulations. In response, cities across the country seek to identify large permeable areas to capture and infiltrate stormwater, treat runoff pollution, and replenish groundwater supplies. For example, the permeability of Philadelphia's park system is estimated to save the city nearly $6,000,000 in stormwater management costs (Harnik and Welle 2009). The AMP project area is highly impervious, but has 252 acres of stormwater capture opportunities in its alleys, which have several benefits over park systems in terms of stormwater capture. Unlike open space purchases, alley redevelopment has no acquisition costs. In addition, green alleys are more effective—and cost-effective—for water infiltration because their widespread distribution allows them to capture and treat stormwater and its associated pollution throughout the city, rather than only in areas near parks. Green alley networks treat water pollution even more effectively than infiltration strategies placed elsewhere by virtue of their location near the source of the pollution, and have the potential to revitalize some of the most polluted and neglected parts of the city.
Resulting groundwater recharge will allow municipalities to reduce the purchase of expensive, imported water (Harnik and Welle 2009). The multiple agencies that operate the storm drain system, import drinking water, and manage groundwater replenishment—agencies that serve to benefit from this project—are potential project partners.

Increased tree canopy and site vegetation also reduces the costs of stormwater facilities, as well as reducing energy use and carbon emissions (Akbari 2002). In addition, indirect benefits include: remediating the urban heat island effect; increasing rain capture, air quality, and biodiversity; reducing wind speeds and ozone concentrations; and improving soil quality (Nowak, Stein, Randler, Greenfield, Comas, Carr, and Alig 2010). In the Denver metropolitan area, the urban forest alone reduced stormwater management facilities enough to save $44 million in one-time construction costs, or $3.2 million in annual savings over a 30-year period (American Forests 2001). The City of Los Angeles has the potential to add 2.5 million trees, with measurable benefits in terms of stormwater runoff, energy savings, and air quality improvement (McPherson, Simpson, Xiao, and Wu 2007). The improved air quality resulting from implementation of the AMP has a monetary value based upon the externality values of air pollutants (Nowak, Crane, Walton, Twardus, and Dwyer 2002). In 2005, Washington, DC saved $1,130,000 through the ability of its urban forest to remove 244 tons of pollutants (Harnik and Welle 2009).



62 ACRE FEET PER YEAR OF STORMWATER COULD BE **INFILTRATED** THROUGH PROJECT IMPLEMENTATION

FIGURE 1.9
THE NEW SOUTH LOS ANGELES WETLAND PARK



FIGURE 1.10
ALLEY IN THE PROJECT AREA

The purpose of the AMP is to provide a framework that will guide green alley network implementation. It is intended to provide guidance on identifying the locations where green alley networks can make the greatest positive impact, and in developing the potential design responses that are best suited to the site conditions and the needs of the community. Although crafted for South Los Angeles specifically, the AMP should also be a resource to any community that is interested in implementing green alleys and streets.

The process for developing the AMP followed an analytic model that included phases incrementally built on each other as they were completed and repeated (Figure 1.11). The primary phases included inventory, outreach, and analysis, repeated at different scales. Initial focus on the regional planning context of the project area in *Chapter 2: Project Context* allowed integration between the AMP and existing policies and management strategies concerning the environment and the community. At the project area scale, research was completed on the biophysical and sociocultural contexts in and documented in *Chapter 3: Project Area Inventory*. In *Chapter 4: Green Alley Network Selection,* GIS modeling was used to highlight the networks of alleys that were most suitable for green alley and green street interventions based on the project's goal and objectives. *Chapter 5: Project Area Analysis* includes gathered input from the project partners, stakeholders, and community; and determines the fundamental issues, constraints, and opportunities facing the project.

With the key issues, opportunities and constraints of the project area identified, the inventory, outreach, and analysis phases were repeated at the scale of the priority alley networks. *Chapter 6: Priority Network Analysis*, includes an inventory of existing conditions and analysis of potential and suitable design responses for green alleys and streets within each. Following, in *Chapter 7: Secondary Analysis + Input,* a subsequent GIS stormwater modeling analysis on the individual alleys is documented and network specific outreach conducted on alley use and design preferences is analyzed. With the information generated in this secondary analysis phase, network designs which draw upon the client, stakeholder, and community feedback as well as relevant precedents, and design programming themes for each of the networks were created and are presented in *Chapter 8: Green Alley Network Planning + Design*. Network master plans illustrate the opportunities and priorities for alleys and streets in the high-priority Phase I green alley networks and serve as a guide for the development of these alley networks. The final phase of the AMP included development guidelines for alley implementation which are presented in *Chapter 9: Future Amplifications*. An analysis of existing related policy accompanied by recommendations for future policy needs for green alley implementation along with potential funding and phasing recommendations and guides for future collaboration with community members within the priority networks as the design process progresses are also included.

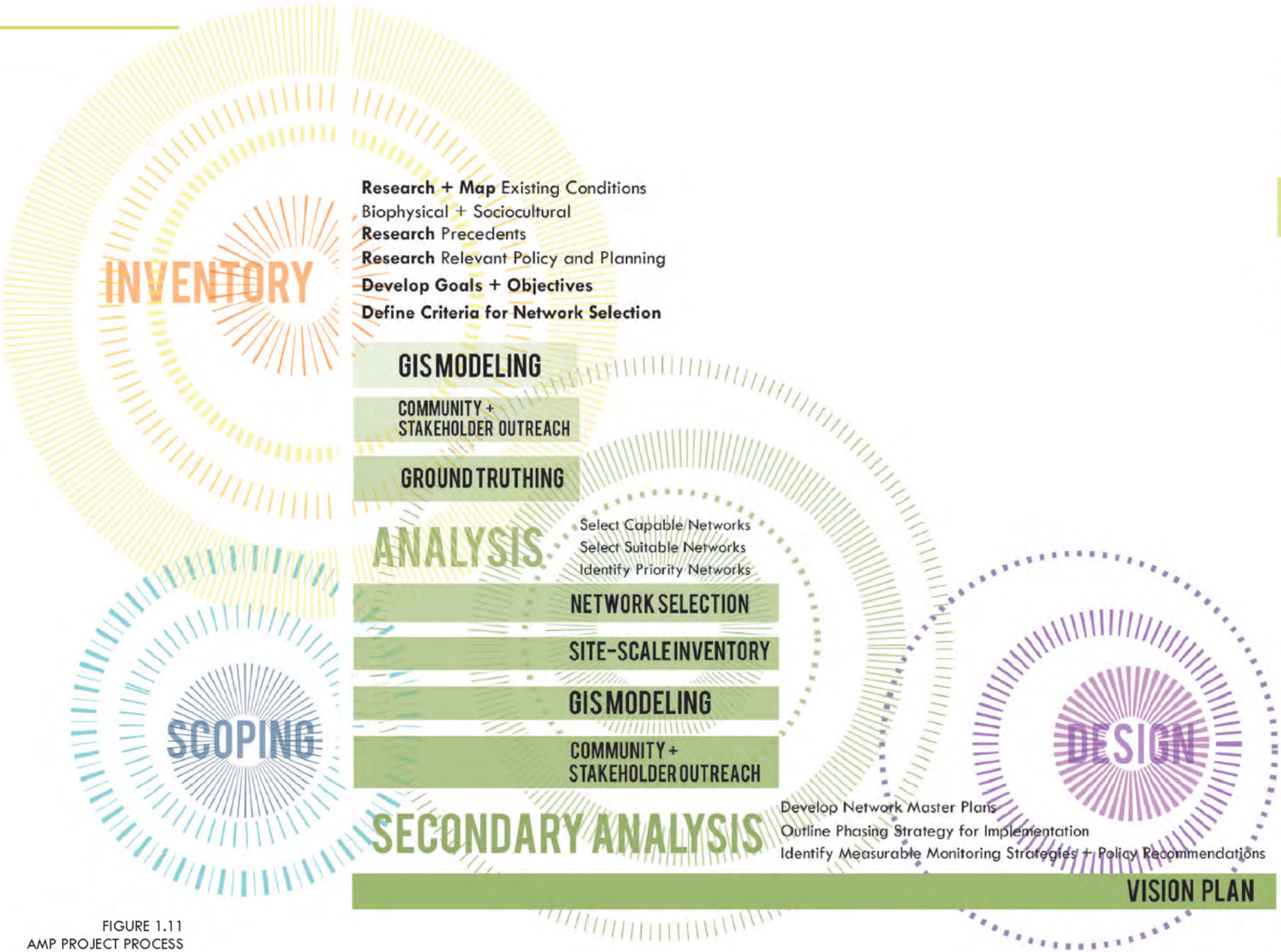


FIGURE 1.11
AMP PROJECT PROCESS





CONTEXT

2. PROJECT CONTEXT

2-A. LOCATION

The AMP has been developed for an 18 square mile portion of the City of Los Angeles, in Los Angeles County (Figure 2.1). The City of Los Angeles does not have officially-designated boundaries for the neighborhoods within the master plan boundaries. Perceptions of the actual physical area that constitutes a particular neighborhood shift over time and amongst people. Originally, a 16 square mile area of focus for this project was established within the heart of South Los Angeles. The area was selected for the following characteristics:

- High population density,
- Poor air quality,
- High rates of obesity, diabetes, and heart disease,
- Economic disadvantage,
- Park poverty,
- Highly impervious groundcover,
- Low percentage of tree canopy, and
- High density of alleys.

During the early phases of the AMP development, this project area boundary was redefined to more closely align with the neighborhood boundaries determined by the Los Angeles Times Mapping Project, which used a combination of Census data, local knowledge, and community feedback (Los Angeles Times 2011a). The boundary modifications served to include entire neighborhoods, whereas previously sections of some neighborhoods had been incidentally excluded. Including entire neighborhoods not only aided data collection, but also avoided a potential equity issue.

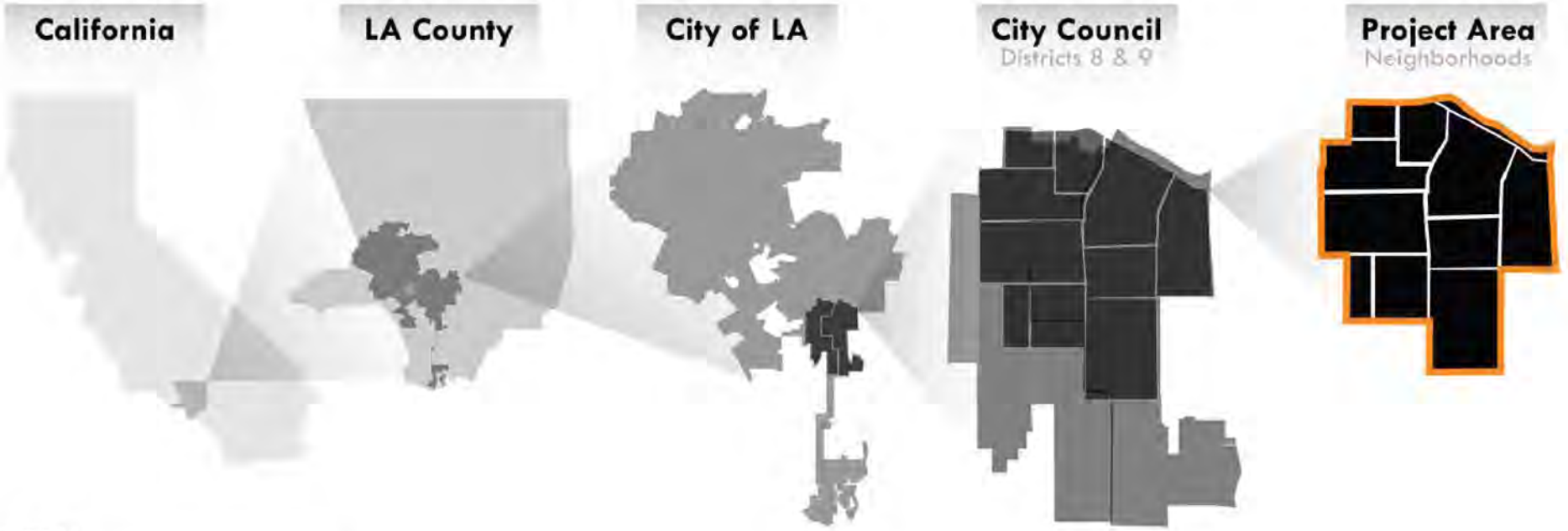


FIGURE 2.1
PROJECT AREA LOCATION AND CONTEXT

Additionally, the new project area is slightly larger, at 18 square miles, and no longer includes a portion of unincorporated Los Angeles County.

The project area boundaries are defined by Interstate 10 to the north, by Western Avenue and Arlington Avenue to the west, by Florence Avenue and Manchester Avenue to the south, and by Alameda Street and Central Avenue to the east. The project area covers large portions of City Council Districts 8 and 9, as well as the southern margin of Council District 1. There are ten neighborhoods contained within the project area, in their entirety, as determined by the Los Angeles Times Mapping Project (Figure 2.2).

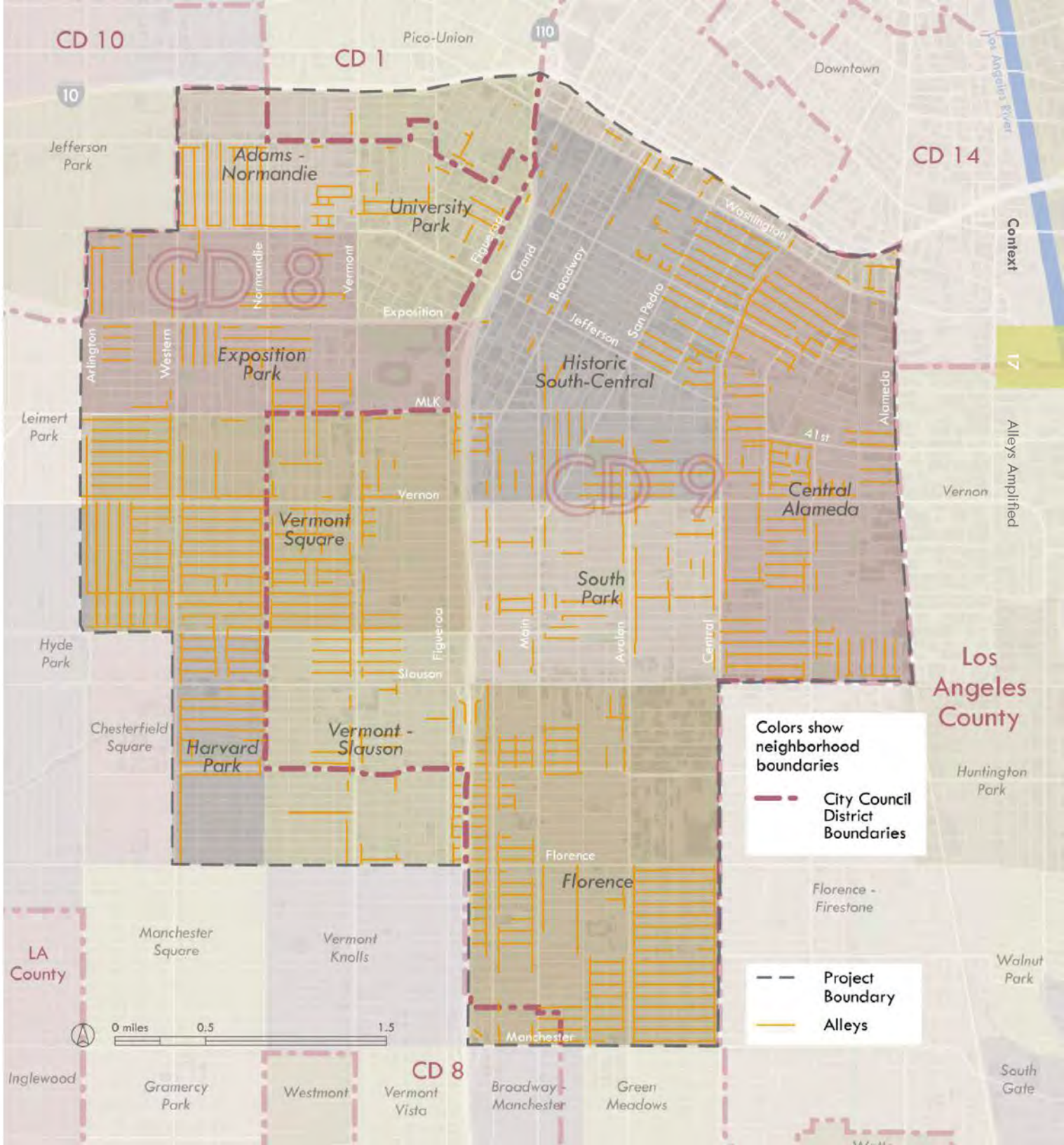


FIGURE 2.2
CITY COUNCIL DISTRICTS AND NEIGHBORHOODS IN PROJECT AREA

Current perceptions, attitudes, and understanding of South Los Angeles and its alleys are sharply influenced by the area's history. Following is a discussion of the project area's transformation in terms of 1) its settlement patterns, 2) the 20 years that have passed since the Los Angeles Riots, and 3) its alleys.

SETTLEMENT PATTERNS (1880s-1990s)

Historically, Los Angeles developed as a polynuclear city. That is to say that there are few spatial divisions between city centers and suburbs (Pastor 2001). Available land, industry, and efficient transportation systems (first rail and later highways) have supported a development pattern of the city and the larger region as many interconnected hubs (Pastor 2001).

Development of South Los Angeles first surged with a real estate boom in the 1880s, after the Santa Fe Railroad opened a transcontinental line. A local rail system spread along the old Santa Monica Boulevard (now Exposition Boulevard) and was a continued catalyst for the growth of the South Los Angeles area (Booher, Kim, and Roxas-Zafra 2001a). By the 1890s, South Los Angeles was emerging as an inner ring suburb as the area began to transition from agricultural land to residential development for blue-collar workers employed by nearby industries, which were expanding along the Los Angeles River.

In the early 1900s, the area around Central Avenue developed as a predominantly African American community (Booher et al. 2001a). This community expanded south along the Central Avenue Streetcar Line after World War I and through the 1920s. Deed restrictions and other social and work discrimination policies made it difficult for African Americans to settle in other parts of the city, resulting in this area of South Los Angeles becoming the heart of African American life in Los Angeles. One of the first jazz scenes in the Western United States emerged from this Central Avenue community, with an active hub in the Dunbar Hotel (Booher et al. 2001a; Booher, Kim, Garcia, and Roxas-Zafra 2001b) (Figure 2.4). The name "South Central" emerged in the 1920s and was used by local residents to "refer to a strictly articulated area that had concentrations of cultural destinations centered on jazz and other businesses owned by African



FIGURE 2.3
DAIRY AT SLAUSON AND VERMONT AVENUES, 1912
Los Angeles Public Library Photo Collection

Americans" (Jimenez y Roth and West 2006, p. 9 quoted in Garcia, Lopez, Lum, and Tabuena 2007, p. 32).

Continued race-restrictive housing covenants caused small sections of the area to become overcrowded by the influx of people during the Great Depression in the 1930s and during World War II in the 1940s (Davis 1992). Further crowding resulted from the availability of defense-related jobs during World War II (Booher et al. 2001a) as public housing projects, including Pueblo Del Rio (Figure 2.5), struggled to keep pace with the industry boom (Gold 2009).

After World War II, and particularly after deed restrictions were banned by the Supreme Court in 1948, African American residents began moving outward from the overcrowded areas and into nearby neighborhoods (Booher et al. 2001a, Booher et al. 2001b). Racial tensions flared as Caucasian residents felt displaced and moved farther away from the city into newer suburbs (Davis 1992). This pattern continued through the 1940s, 1950s, and 1960s. Other minority groups began to move into the area as well; Mexican-Americans settled on the eastern boundaries of South Los Angeles and many Chinese immigrants made their homes in the central area of South Los Angeles (Booher et al. 2001b).

During the 1970s, and especially the 1980s and 1990s, African American residents continued to move to other parts of the Los Angeles Basin in large numbers, while Asians and Mexican-Americans continued to migrate in to take their place (Booher et al. 2001b, Bergesen and Herman 1998). This Asian and Mexican-American immigration and African American emigration led to racial tensions between the remaining African American population and the new Latino residents, and produced a desegregation of African American neighborhoods (Irazábal and Punja 2007 in Irazábal and Farhat 2008, Camarillo 2007, Bergesen and Herman 1998). Between the 1970 and 1990 censuses, the African American population shifted from 86.2% of the area to 39.6% and the Mexican-American population shifted from 9.6% in 1970 to 59% in 1990. Currently there is a growing number of Central and South American Latinos as compared to the predominantly Mexican-American population of the past (Booher et al. 2001b).



FIGURE 2.4
DUNBAR HOTEL AT CENTRAL AVENUE AND E 42ND PLACE, 1928
Los Angeles Public Library Photo Collection

This community has endured many conflicts over recent years as a result of such complex social issues as social injustices, gangs, and drugs. However, with its significant ties to African-American culture and the immigration of Asians, Mexican-Americans, and other Latinos, South Los Angeles is today a community of undeniable culture, diversity, and character. The AMP recognizes the challenges faced by the communities of South Los Angeles and understands its limitations in impacting complex social issues, yet the AMP strives to be a starting point from which additional opportunities will spread. The amplification of streets, alleys, and other public spaces can initiate further community involvement and provide multiple benefits throughout South Los Angeles.

20 YEARS AFTER THE LOS ANGELES RIOTS (1992-2012)

The 20th Anniversary of the Los Angeles Riots was marked in April 2012. The passing of the anniversary brought reflection upon what the South Los Angeles community experienced, how the community has changed over the past 20 years, and what the community may one day become.

Marqueece Harris-Dawson, President and CEO of Community Coalition, a nonprofit working to help improve the social and economic conditions in South Los Angeles, explained that following the Los Angeles Riots the City, County, and community were prompted to consider what needed to be changed. According to Harris-Dawson, three action items rose to the top: "reform the police department, rebuild community ties fractured by the crack [cocaine] epidemic and violence of the 1980s, and increase economic investments and opportunities in South [Los Angeles]" (Harris-Dawson 2012, n.p.). Since 1992, a more racially diverse Los Angeles Police Department has devoted greater effort into community policing and engagement, and city leaders, policy makers, and the police embrace intervention and prevention strategies such as the Summer Night Lights program, designed to keep youth engaged. Community activism has helped to reduce the number of liquor stores, a high-profile target during the riots, by twenty percent (Harris-Dawson 2012). Despite the progress made by the community over the past 20 years, South Los Angeles today still suffers from vacant lots and a lack of grocery stores, banks, and basic services (Harris-Dawson 2012). One of the ways in which the AMP attempts to build upon the transformation of South Los Angeles is to utilize alleys, streets, and vacant lots as opportunities to supply much needed uses and amenities.

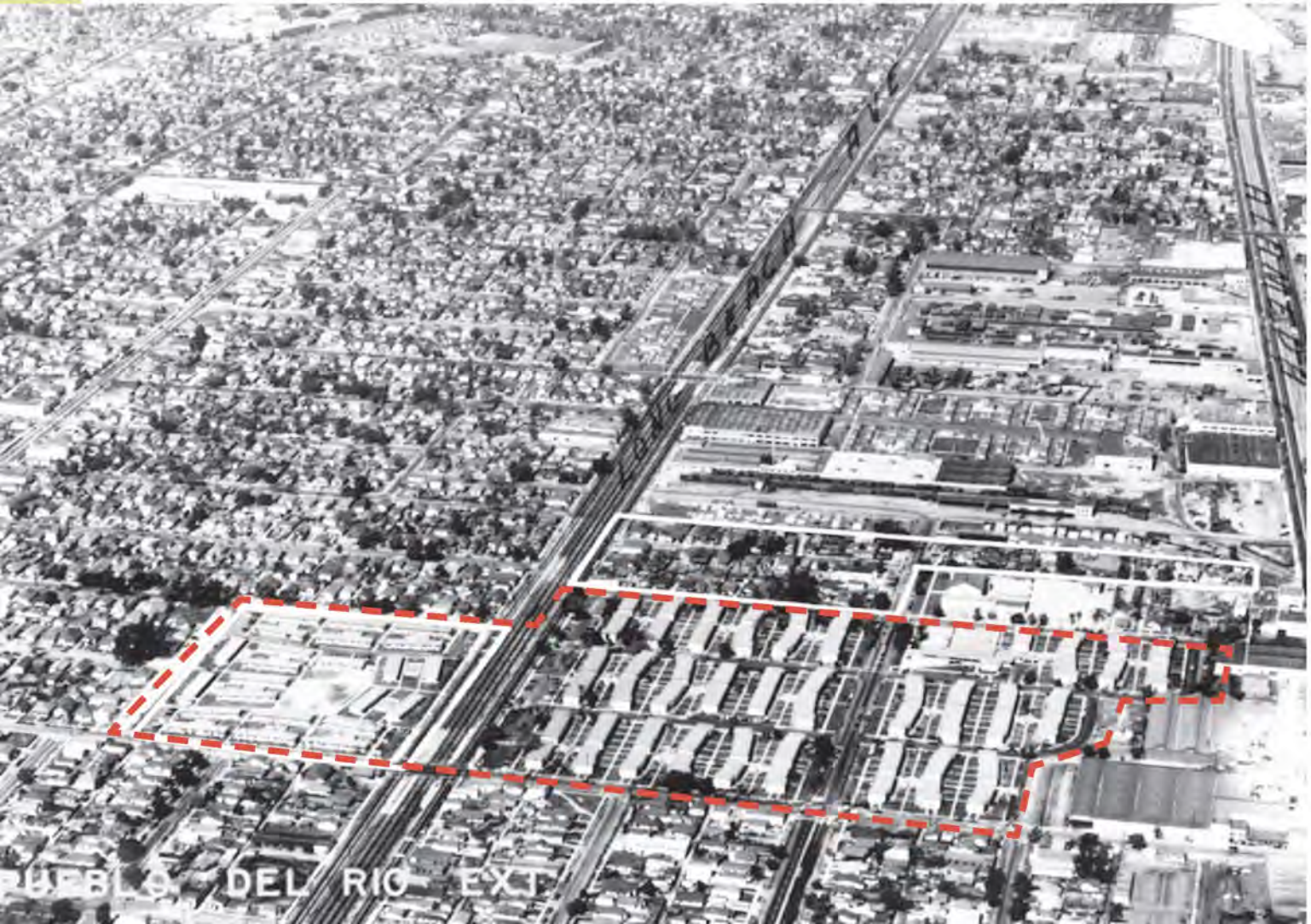


FIGURE 2.5
PUEBLO DEL RIO
PUBLIC HOUSING PROJECT, N.D.
Los Angeles Public Library Photo Collection

LOS ANGELES ALLEYS PAST + PRESENT

Alleys were originally included in neighborhoods as service routes, but they have long functioned as places for activities related to home maintenance, including trash collection and auto repair (Engler 1997). Residences in early metropolitan suburbs often required more labor to maintain as a result of the lack of infrastructure and services, such as piped water and electricity (Harris and Lewis 2001), and the utility corridor function of these alleys has long been associated with domestic maintenance. Alleys are also an extension of the backyard, providing intimate access to private residences for those who live along the alleys (Wolch, Newell, Seymour, Huang, Reynolds, and Mapes 2010).

Over the years, these alleys have seen consistent dumping of garbage (Figure 2.8A-C) with intermittent community efforts to eliminate the waste (Figure 2.8B). In 1993, the City of Los Angeles initiated the Nuisance Alley Abatement Program in response to community demand to mitigate illegal dumping in their alleys by installing gates at the entrances. These gates could be locked and access controlled by the surrounding residents. Approximately 11,000 alleys were gated, rendering them off-limits to public access until 2004, when the State



FIGURE 2.6
CHILDREN WALK DOWN AN UNPAVED ALLEY, 1950
Los Angeles Public Library Photo Collection



FIGURE 2.7
ALLEY IN WATTS, 1987
Los Angeles Public Library Photo Collection



FIGURE 2.8A
SLUM HOUSING, 1945
Los Angeles Public Library Photo Collection



FIGURE 2.8B
RESIDENTS PROTEST DUMPING, 1989
Los Angeles Public Library Photo Collection

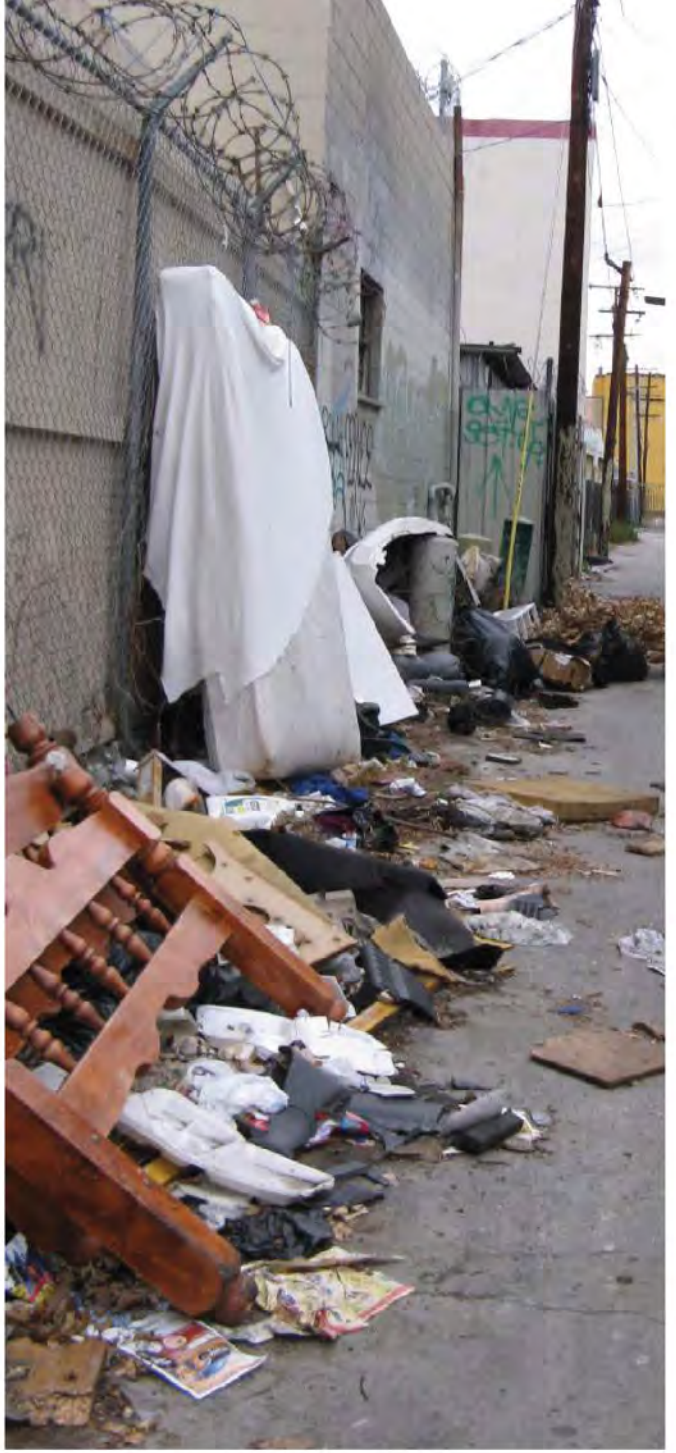


FIGURE 2.8C
DUMPING IN PROJECT AREA ALLEY, 2012

of California ruled the program illegal. Presently, while the City no longer installs new gates, many still remain with varied signs of use and function (Figure 2.10).

Today, Los Angeles lacks a coherent public policy for alleys, and ownership and responsibility are often vague and difficult to define. Currently, a four-tiered management structure includes the Department of Public Works Bureau of Street Services, Bureau of Sanitation, Bureau of Street Lighting, and local residents. The Bureau of Street Services is responsible for clearing, cleaning, and removing illegally dumped materials (Lot Cleaning Division), the resurfacing and reconstruction of alleys (Resurfacing and Reconstructing Division), and the maintenance of alleys and trash receptacles (Street Maintenance Division). The Bureau of Sanitation is responsible for managing trash collection and the Bureau of Street Lighting is responsible for installing alley lighting (City of Los Angeles Green Streets Committee 2012, City of Los Angeles Department of Public Works Bureau of Street Services n.d., City of Los Angeles Department of Public Works Bureau of Street Lighting 2012). Through a contract with the City, the nonprofit Coalition for Responsible Community Development's (CRCD) Department of Neighborhood and Community Beautification formerly provided graffiti abatement, bulky item pick-up, and alley clean-up services for the Vernon-Central area of South Los Angeles (Coalition for Responsible Community Development n.d.). However, with the dissolution of the Community Redevelopment Agencies as of 2012, the CRCD is now only occasionally involved in alley clean-up efforts (City of Los Angeles Green Streets Committee 2012).

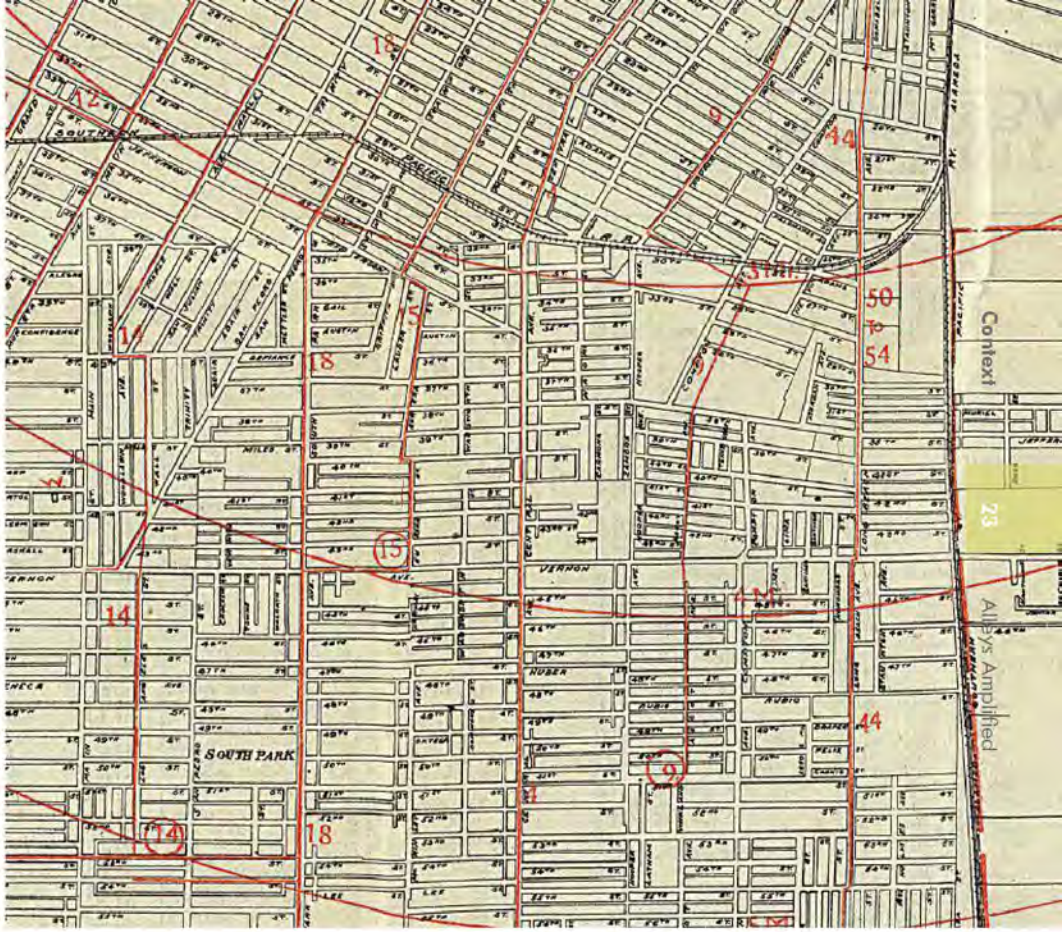
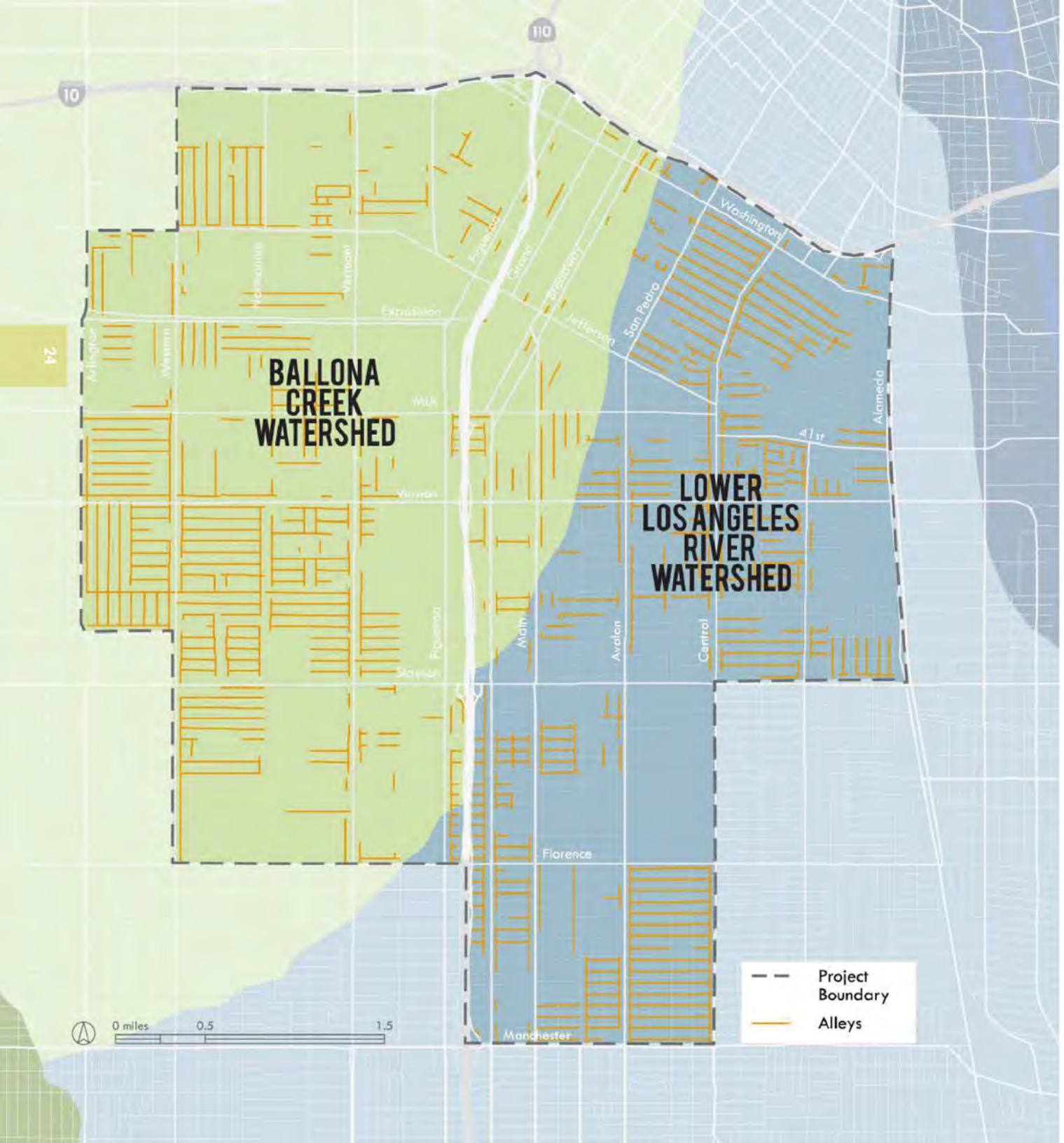


FIGURE 2.9 (ABOVE)
EARLY LOS ANGELES STREET GUIDE SHOWING ALLEYS, 1908

Cartography Associates



FIGURE 2.10
ALLEY GATED UNDER THE NUISANCE ALLEY ABATEMENT PROGRAM



2-C. PLANNING AND POLICY

There are a multitude of agencies, organizations, and individuals whose policies shaped the environment and culture of Los Angeles, and contributed knowledge to this project regarding the ecosystems, communities, and alleys found within the region. This chapter gives a brief overview of some of the existing policies and literature that directly or indirectly shape the efforts of the South Los Angeles Green Alley Master Plan (AMP). Areas of policy and literature important to the AMP include watershed health and management, sustainable communities and green initiatives, and community plans and neighborhood planning.

WATERSHED MANAGEMENT

The project area is located on the boundary between two watersheds: Ballona Creek on the west and Compton Creek, a major tributary of the Los Angeles River, on the east of the AMP area (Figure 2.11).

Creeks and rivers in the Los Angeles Basin are historic wanderers, changing course over time and draining into the Pacific Ocean at many different locations. Ballona Creek has at times merged with the equally meandering Los Angeles River when it met the Pacific Ocean at the Santa Monica Bay. Both Ballona and Compton Creeks are now controlled channels, entirely separate from the engineered course of

FIGURE 2.11
HISTORIC WATERSHED BOUNDARIES IN THE PROJECT AREA

the Los Angeles River, which now drains into the Pacific Ocean near Long Beach. Much of the alluvium that once collected and allowed infiltration of water flow into the groundwater supply is now covered with the impervious materials of a developed city, preventing potential recharge from reaching the aquifers.

Current watershed management strategies in Southern California are focused on protecting and improving water quality both above and below ground while, at the same time, improving quality of life for those living within these watersheds. The AMP considers relevant policies and planning efforts related to watershed concerns within the project area and seeks to adopt, support, and advance alley network-applicable concepts in, but not limited to, the following propositions and plans:

- *Greater Los Angeles County Integrated Regional Water Management Plan* (IRWMP),
- *Los Angeles River Revitalization Master Plan* (LARRMP),
- City of Los Angeles Proposition O,
- State of California Proposition 84,
- City of Los Angeles Low Impact Development (LID) Ordinance
- *Compton Creek Watershed Management Plan*, and,
- *Ballona Creek Watershed Management Plan*.

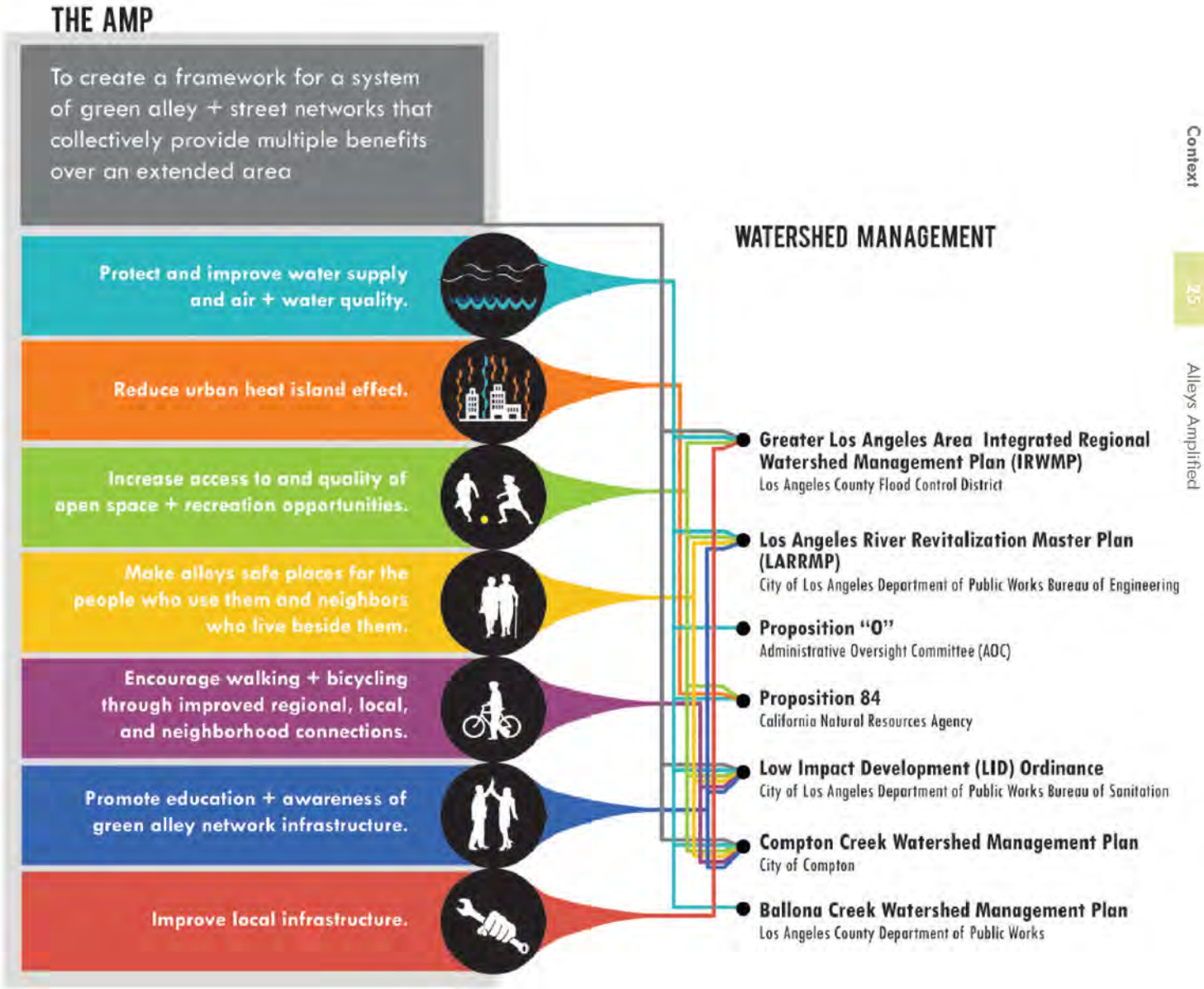


FIGURE 2.12
DIAGRAM OF WATERSHED MANAGEMENT PLAN OBJECTIVES

GREATER LOS ANGELES COUNTY INTEGRATED REGIONAL WATER MANAGEMENT PLAN (IRWMP)

The *Integrated Regional Water Management Plan* (IRWMP) for the Greater Los Angeles County Region was developed to help the region successfully compete for water management funding opportunities and facilitate regional cooperation. As stated on the Greater Los Angeles County Region IRWMP website, "regional collaboration can promote a more efficient, comprehensive, and effective approach to water resource management while being responsive within a regional context to the needs of individual communities and jurisdictions" (IRWMP 2006, n.p.). Objectives from the IRWMP are to:

Improve Water Supply

- Optimize local water resources to reduce the region's reliance on imported water.

Improve Water Quality

- Comply with water quality regulations (including total maximum daily loads of pollutants) by improving the quality of urban runoff, stormwater, and wastewater.
- Protect and improve groundwater and drinking water quality.

Enhance Habitat

- Protect, restore, and enhance natural processes and habitats.

Enhance Open Space and Recreation

- Increase watershed-friendly recreational space for all communities.

Sustain Infrastructure for Local Communities

- Maintain and enhance public infrastructure related to flood protection, water resources, and water quality (IRWMP 2006, p. 3-2).

According to IRWMP, many of the projects to date are single purpose projects within the same location or in close proximity to one another (IRWMP 2006). This lack of linkages between projects provides opportunities for project integration in achievement of IRWMP's planning targets (IRWMP 2006). The AMP, aimed at realizing multiple benefits through networks of alley revitalization, strives to maximize linkages with other projects to support IRWMP's planning targets. These targets align with the AMP's goals and objectives in terms of geographic integration, strategy integration, or multi-agency projects as identified by IRWMP (IRWMP 2006).

LOS ANGELES RIVER REVITALIZATION MASTER PLAN (LARRMP)

The *Los Angeles River Revitalization Master Plan* (LARRMP) was developed between 2005 and 2007 to outline a strategy for improving the social, economic, and ecological value of the Los Angeles River (LARRMP n.d.). Eighteen public workshops as well as numerous meetings with neighborhood groups, stakeholders, advisors, and others were held to inform the plan (LARRMP n.d.). The City adopted the plan in May 2007 (City of Los Angeles 2011a). Objectives from the LARRMP are to:

Revitalize the River

- Enhance flood storage.
- Enhance water quality.
- Enable safe public access.
- Restore a functional ecosystem.

Green the Neighborhoods

- Create a continuous river greenway.
- Connect neighborhoods to the river.
- Extend open space, recreation, and water quality features into neighborhoods.
- Enhance river identity.
- Incorporate public art along the river.

Capture Community Opportunities

- Make the river the focus of activity.
- Foster civic pride.
- Engage residents in the community planning process and consensus building.
- Provide opportunities for educational and public facilities.
- Celebrate the cultural heritage of the river.

Create Value

- Improve the quality of life.
- Increase employment, housing, and retail space opportunities.
- Create environmentally-sensitive urban design and land use opportunities and guidelines.
- Focus attention on underused areas and disadvantaged communities (City of Los Angeles 2007).

The AMP project area falls within the Compton Creek watershed, which drains into the Los Angeles River. Therefore, due to the project area's proximity and connection to the Los Angeles River, the AMP calls for a recognized relationship with the LARRMP. This effort will help to achieve the LARRMP objectives while also raising awareness of the impacts of green alley networks to water quality and function, beyond the boundaries of the AMP project area.

CITY OF LOS ANGELES PROPOSITION O

Voters in the City of Los Angeles passed Proposition O in 2004 (City of Los Angeles n.d.). This proposition authorized the City "to issue a series of general obligation bonds for up to $500 million for projects to protect public health by cleaning up pollution, including bacteria and trash, in the City's watercourses, beaches, and ocean, in order to meet the Federal Clean Water Act requirements" (City of Los Angeles n.d., n.p.). The measure also funds improvements to protect water quality, provide flood protection, and increase water conservation, habitat protection, and open space (City of Los Angeles n.d.). Proposition O demonstrates the trend in Los Angeles politics towards recognizing the importance and interdependence of pollution prevention, water quality, and watershed health. It has funded such projects as the South Los Angeles Wetland Park, adjacent to the Avalon Green Alley Demonstration Project (City of Los Angeles 2008). The objective of the proposition is to fund projects that fall within one or more of the following categories:

- River, lakes, beaches, bays, and ocean water quality protection projects,
- Water conservation, drinking water, and source protection projects,
- Flood water reduction, river, and neighborhood parks that prevent polluted runoff and improve water quality projects, and/or
- Stormwater capture, clean-up, and re-use projects (City of Los Angeles n.d.).

Proposed projects under the AMP meet all qualifications and are eligible for Proposition O funding since the redevelopment of alleys and surrounding streets will reduce loads of pollutants to impaired waters, will not negatively affect flood protection, will not lead to a net loss of habitat or hardening of creeks or rivers, and will not exacerbate any existing environmental problems (City of Los Angeles n.d.). Therefore, Proposition O is a potential source of funding for the redevelopment of alleys as proposed by the AMP.



FIGURE 2.13
POLLUTION AND POOR WATER QUALITY PREVENTION PROTECTS PUBLIC HEALTH

STATE OF CALIFORNIA PROPOSITION 84

Proposition 84, or the Safe Drinking Water, Water Quality and Supply, Flood Control, River and Coastal Protection Bond Act of 2006, "authorizes $5.388 billion in general obligation bonds to fund safe drinking water, water quality and supply, flood control, waterway and natural resource protection, water pollution and contamination control, state and local park improvements, public access to natural resources, and water conservation efforts" (State of California 2012, n.p.).

Of the $5.388 billion authorized by the proposition, $400,000 was awarded under the California Water Plan for updating the existing Model Efficient Landscape Ordinance, as specified in Assembly Bill 1881 (AB 1881), and $580 million was allocated under bond Chapter 9 Sustainable Communities and Climate Change Reduction for "improving the sustainability and livability of California's communities through investment in natural resources..., reducing urban communities' contribution to global warming and increasing their adaptability to climate change while improving quality of life in those communities" (State of California 2012, n.p.). As of January 2012, approximately $553 million of the $580 million had been committed, leaving a balance of approximately $26 million (State of California 2012).

The objective of Proposition 84 is to fund projects that fall within one or more of the following categories:

- Urban greening projects that reduce energy consumption, conserve water, improve air and water quality, and provide other community benefits,
- The acquisition and development of new parks and expansion of overused parks that provide park and recreational access to underserved communities, and/or
- The development of regional and local land use plans that are designed to promote water conservation, reduce automobile use and fuel consumption, encourage greater infill and compact development, protect natural resources and agricultural lands, and revitalize urban and community centers (State of California 2010).

As the AMP is a project that provides park and recreational access, reduces automobile use and fuel consumption, and revitalizes urban and community centers, Proposition 84 is a potential source of funding for the redevelopment of alleys. Additionally, the State Water Resources Control Board developed Funding Guidelines (project selection and evaluation guidelines) and a Guidance Document (a comprehensive guidance document for evaluating and measuring the effectiveness of projects) for the proposition (State of California 2012).



CITY OF LOS ANGELES LOW IMPACT DEVELOPMENT (LID) ORDINANCE

In September 2011, the Los Angeles City Council unanimously passed the Low Impact Development (LID) ordinance. The Bureau of Sanitation collaborated with community members, environmental organizations, business groups, and the building industry to develop this landmark ordinance for the city (City of Los Angeles 2011b). The LID ordinance applies to all projects that require building permits (City of Los Angeles 2011b) and calls for "development and redevelopment projects to mitigate runoff in a manner that captures rainwater at its source, while utilizing natural resources including rain barrels, permeable pavement, rainwater storage tanks, and infiltration swales or curb bumpouts to contain water" (City of Los Angeles 2011b, n.p.). To ensure compliance with city codes and standards, all guidelines for alley redevelopment presented in the AMP abide by the terms outlined in the LID Ordinance.

FIGURE 2.14
LOW IMPACT DEVELOPMENT PARKING LOT AT RIO DE LOS ANGELES STATE PARK

COMPTON CREEK WATERSHED MANAGEMENT PLAN

The Compton Creek Watershed is a sub-watershed to the Los Angeles River, composed of about 42 square miles. It is an impaired watershed, with impairments resulting from excess levels of copper, lead, pH imbalance, and coliform in the water column (Los Angeles and San Gabriel Rivers Watershed Council 2005). One of the most significant contributors to pollution in Compton Creek is nonpoint source urban runoff (Los Angeles and San Gabriel Rivers Watershed Council 2005). With only 3.3% of the land within the watershed comprised of open space, parks, agricultural, or vacant lands, it is clear that the lack of permeable surfaces is contributing to this pollution problem (Kenefick 2011). The Council for Watershed Health (formerly the Los Angeles and San Gabriel Rivers Watershed Council) developed a stakeholder process, meeting with residents and community groups, technical experts, and stakeholder agencies, to collect input on water quality project priorities and management plan goals, objectives, and strategies (Kenefick 2011). Objectives of the Compton Creek Watershed Management Plan include:

Water

- Improve water quality.
- Improve wetland and riparian habitat quality and quantity.
- Maintain flood protection.
- Optimize water resources to reduce dependence on imported water.

Land

- Improve terrestrial habitat quality and quantity.
- Improve access to open space and recreation for all communities.
- Improve pedestrian and bicycle access and safety.
- Practice stewardship of the landscape.

Community

- Protect and enhance public safety.
- Involve the public through outreach and education.
- Implement multi-objective planning and projects.
- Realize the potential of watershed restoration for sustainable economic development (Los Angeles and San Gabriel Rivers Watershed Council 2005).

The AMP addresses the issue of water quality in the Compton Creek Watershed by identifying those areas within the project area that have the potential for high levels of pollutants and designing possible solutions for remediation. The AMP will further meet the land and community objectives of the Compton Creek Watershed Management Plan by developing design guidelines that improve pedestrian and bicycle access and safety and protect and enhance public safety.

Ballona Creek drains an area of about 130 square miles into the Santa Monica Bay. Approximately 85% of the land within the watershed is developed with homes, businesses, roads, or other urbanized uses. As a result of urbanization, "surface and groundwater quality has been degraded, natural hydrologic functions modified, plant and wildlife diversity and movement reduced, wildlife decreased, and water quality tainted in Ballona Creek and Santa Monica Bay" (Ballona Creek Watershed Task Force 2004, p. 2). The County of Los Angeles, City of Los Angeles, Santa Monica Bay Restoration Commission, and Ballona Creek Renaissance convened the stakeholder group Ballona Creek Watershed Task Force to develop a management plan for the Ballona Creek Watershed. Objectives of the Ballona Creek Watershed Management Plan include:

Water

- Improve quality of surface water and groundwater.
- Maintain flood protection.
- Restore hydrologic function to Ballona Creek and tributaries where feasible.
- Optimize water resources to reduce dependence on imported water.
- Improve aquatic, estuarine, and riparian habitat quality and quantity.

Land

- Improve habitat quality, quantity, and connectivity.
- Improve access to open space and recreation for all communities.
- Improve pedestrian and bicycle access and safety.
- Practice stewardship of the landscape.

Planning

- Coordinate watershed planning across jurisdictions and boundaries.
- Implement multi-objective planning and projects.
- Use science as a basis for planning.
- Involve the public through outreach and education.
- Utilize the plan in an ongoing management process.
- Realize the potential of watershed restoration for sustainable economic development (Ballona Creek Watershed Task Force 2004).

The AMP addresses the issue of water quality in the Ballona Creek Watershed by identifying those areas within the project area that have the potential for high levels of pollutants and by designing possible solutions for remediation. The AMP meets the land and community objectives of the Ballona Creek Watershed Management Plan by developing design guidelines that improve pedestrian and bicycle access and safety, increase recreation opportunities, and promote stewardship of alley networks.

FIGURE 2.15
BALLONA CREEK AT BALLONA WETLANDS
flickr.com/stonebird, 2005



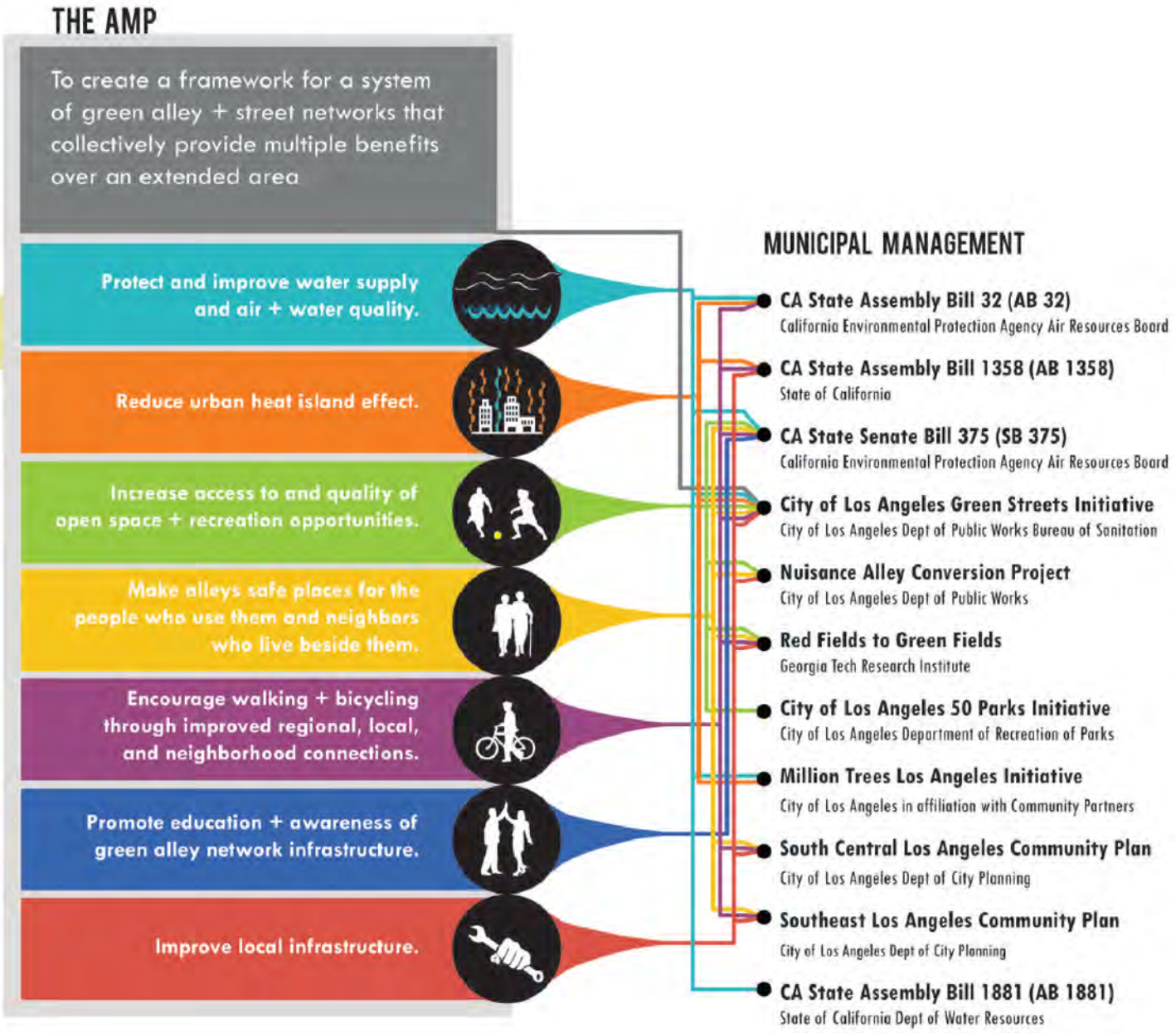


FIGURE 2.16
REGIONAL MUNICIPAL MANAGEMENT OBJECTIVES AND THE AMP

MUNICIPAL MANAGEMENT

The AMP also considers those complementary municipal initiatives and policies with objectives that are closely related to the goals of the AMP. The objectives of the following measures address issues of transportation, underutilized land, safety, open space, and sustainability:

- Assembly Bill 32 (AB 32),
- Assembly Bill 1358 (AB 1358),
- Senate Bill 375 (SB 375) Sustainable Communities Strategy,
- City of Los Angeles Green Streets Initiative,
- Nuisance Alley Conversion Project,
- Red Fields to Green Fields,
- City of Los Angeles 50 Parks Initiative,
- Million Trees Los Angeles Initiative,
- *South Central Los Angeles Community Plan*, and,
- *Southeast Los Angeles Community Plan*.

ASSEMBLY BILL 32 (AB 32)

Assembly Bill 32 (AB 32), the California Global Warming Solutions Act of 2006, is presently one of the State's most prominent initiatives addressing climate change and the reduction of greenhouse gas emissions in California to 1990 levels by 2020 (Air Resources Board 2011a). The State of California Air Resources Board (ARB) developed a scoping plan containing strategies for reducing greenhouse gases, along with a Functional Equivalent Document (FED) that analyzed potentially significant environmental impacts resulting from the implementation of the plan (ARB 2011a). The draft *2008 Climate Change Scoping Plan* and FED was released for public review and comments in June 2008, approved by the Board in December 2008, and re-approved by the Board in August 2011 to include a final supplement to the FED that provides an expanded analysis of project alternatives (ARB 2011a, ARB 2011b). The 2008 Climate Change Scoping Plan includes the following key elements for reducing greenhouse gas emissions to 1990 levels by 2020:

- Expanding and strengthening existing energy efficiency programs as well as architectural and appliance standards,
- Achieving a statewide renewables energy mix of 33%,
- Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system,
- Establishing targets for transportation-related greenhouse gas emissions for the region throughout California and pursuing policies and incentives to achieve those targets, and
- Adopting and implementing measures pursuant to existing State laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard (ARB 2008, p. 8).

The AMP supports AB 32 by encouraging more walking and bicycling through the development of green alley networks that also include energy efficient lighting and infrastructure.



FIGURE 2.17
USING PUBLIC TRANSPORTATION HELPS TO REDUCE GREENHOUSE GAS EMISSIONS

ASSEMBLY BILL 1358 (AB 1358)

Assembly Bill 1358 (AB 1358), the Complete Streets Act of 2008, requires that the legislative body of a city or county modify the circulation element of their general plan for "a balanced, multimodal transportation network that meets the needs of all users of streets, roads, and highways, defined to include motorists, pedestrians, bicyclists, children, persons with disabilities, seniors, movers of commercial goods, and users of public transportation" (State of California 2008b, p. 91). This bill is an effort to promote walking and bicycling and fulfill the State's commitment to reduce greenhouse gas emissions in California. The AMP supports AB 1358 by strengthening the project area's multimodal transportation network infrastructure through the redevelopment of alleys as safe and convenient connections for all users.



FIGURE 2.18
INSUFFICIENT PEDESTRIAN AND BICYCLE INFRASTRUCTURE IN THE AMP PROJECT AREA

SENATE BILL 375 (SB 375) SUSTAINABLE COMMUNITIES STRATEGY

Senate Bill 375 (SB 375), the Sustainable Communities and Climate Protection Act of 2008, was passed to improve California's ability to reach the goals previously stated in AB 32 (ARB 2011a). SB 375 "calls for the integration of transportation, land use, and house planning, and also establishes the reduction of greenhouse gas emissions as one of the main goals for regional planning" (Southern California Association of Governments 2010, p. 1).

The Southern California Association of Governments (SCAG) is the metropolitan planning organization that represents Los Angeles, Orange, San Bernardino, Riverside, Ventura, and Imperial Counties, and is responsible for the development of a regional Sustainable Communities Strategy (SCS) and implementation of SB 375 (SCAG n.d.b). SCAG's vision for the SCS includes "more affordable transportation and housing choices for more people, a more active and healthier populace, safer streets and sidewalks, protected open space, cleaner air, and healthier environment" (SCAG 2011, p. 1). As outlined in SCAG's 2012-2014 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS), the primary goal for implementing SB 375 is to provide a vision for "future growth in Southern California that will decrease per capita greenhouse gas emissions from automobiles and light trucks… this leads to strategies that can help reduce per capita vehicle miles traveled over the next 25 years" (SCAG 2012, p. 112). The RTP/SCS calls for public agencies at all levels of government to implement a wide range of strategies that focus on four key areas:

- A land use growth pattern that accommodates the region's future employment and housing needs and protects sensitive habitat and natural resource areas,
- A transportation network that consists of public transit, highways, local streets, bikeways, and walkways,
- Transportation Demand Management (TDM) measures that reduce peak-period demand on the transportation network, and
- Transportation System Management (TSM) measures that maximize the efficiency of the transportation network (SCAG 2012, p.151).

The AMP supports SB 375 and SCAG's vision by developing green alley networks that will provide multiple benefits, including increased walking and bicycling, reduced greenhouse gas emissions, increased health and physical activity within the community, and safer streets and sidewalks.

CITY OF LOS ANGELES GREEN STREETS INITIATIVE

Within the City of Los Angeles, there are approximately 6,500 miles of streets, 10,000 miles of sidewalks, 900 miles of alleys, and 34,000 catch basins (City of Los Angeles Department of Public Work Bureau of Sanitation 2009). The streets and alleys are currently maintained by the City's Department of Public Works, Bureau of Street Services. However, sidewalks and parkways are required to be maintained by abutting private property owners per the California Street and Highway Code (State of California 1911, City of Los Angeles Department of Public Works Bureau of Sanitation 2009).

Representatives from multiple City of Los Angeles agencies worked together to develop the Green Streets Initiative, "an aggressive, proactive measure that aims not only to meet water quality objectives but also to address multiple beneficial uses such as infiltration to recharge groundwater aquifers, using 'green' BMPs … to provide aesthetics as well as reducing the heat island effect, and to implement these objectives with minimum impact to the environment" (City of Los Angeles Department of Public Works Bureau of Sanitation 2009, p. 1-3). In October 2008, the Board of Public Works adopted the report, recommending the Los Angeles City Council support the Green Streets Committee by undertaking actions to include green infrastructure elements into new and pending Capital Improvement Projects (Bureau of Sanitation 2009).

Offered within the Green Streets Initiative, the *Green Streets and Green Alleys Design Guidelines* now provide resources, such as a process flowchart and checklist, for implementing a green street or green alley project and fact sheets on green street BMPs, with design-related guidance. The document also provides design strategies that can be utilized by the AMP for green streets, parking lots, and alleys; and specific example projects with green street applications in the City of Los Angeles (City of Los Angeles Department of Public Works Bureau of Sanitation 2009). These strategies are supplemented in the AMP's Alley Development Alternatives (Appendix A) by additional green alley and green street design responses, including applications and benefits.

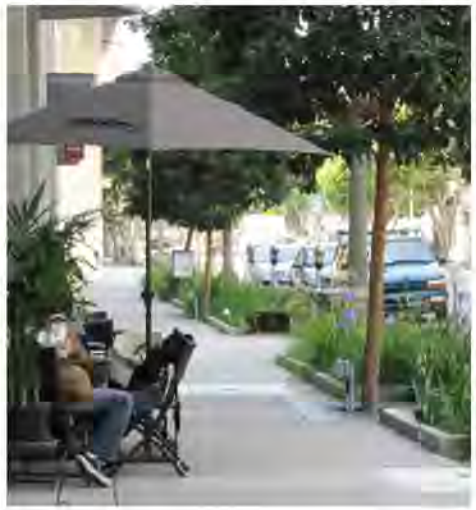


FIGURE 2.19
A GREEN STREET INSTALLED IN LOS ANGELES AT HOPE AND 11TH STREETS

NUISANCE ALLEY CONVERSION PROJECT

In an effort to abate dumping and crime, and improve the quality of life in Los Angeles' neighborhoods, a joint venture between community members, the Los Angeles City Council, and Department of Public Works established the Nuisance Alley Conversion Project (also referred to as the Nuisance Alley Abatement Program or the Nuisance Alley Closure Program) in 1993 to allow for the gating of "nuisance alleys" (City of Los Angeles 2012a, Valencia 1996). Once these alleys were gated and locked, city workers provided keys to abutting property owners who then became responsible for maintaining the alleys (Jones 2002, Martin 1998). However, despite some reduction of alley crimes and the popularity of the program, the legal closure of alleys ended in 2004 when a judge ruled in favor of a group called "Citizens Against Gated Enclaves" after it sued the City of Los Angeles for infringing on their rights of ingress and egress to city right-of-ways (Cassidy, Newell, and Wolch 2008, Martin 1998). While the alley gates are now technically illegal, many remain standing due to lack of action to remove them. If a gated alley is redeveloped through the AMP (or any other initiative), public access must be allowed, which will likely result in gate removal (City of Los Angeles Green Streets Committee 2012w).

The Nuisance Alley Conversion Project was operated as a program of Operation Clean Sweep (OCS), founded in 1987 under the Board of Public Works. OCS was the City's long-term, citywide anti-litter and anti-graffiti program and functioned as a resource for community improvement programs throughout the City (City of Los Angeles 2002). The Office of Community Beautification (OCB) has since taken over and currently operates a graffiti removal hotline that residents can call to report graffiti on private or publicly owned properties, provides an online anti-graffiti request system, and processes information leading to conviction of graffiti vandalism or illegal dumping (City of Los Angeles 2012b). The OCB also funds community beautification projects through their Community Beautification Grant (CB Grant) program, which is currently suspended due to the City's budget deficit (City of Los Angeles 2012b). Projects proposed by the AMP may pursue funding through the CB Grant program if grants are made available in the future.

RED FIELDS TO GREEN FIELDS

Red Fields to Green Fields is a national research effort analyzing the impacts of acquiring financially distressed properties 'in the red' and converting them into green spaces of public parks and adjacent land 'banked' for future sustainable development (Red Fields to Green Fields n.d.). Phase One studies in the Red Fields to Green Fields effort included Atlanta, Cleveland, Denver, Miami-Dade, Philadelphia, and Wilmington. Phase Two included studies in the cities of Detroit, Hilton Head Island, Phoenix, Houston, and Los Angeles. The Los Angeles study was conducted by Red Fields to Green Fields Los Angeles with a 2010-2011 Cal Poly Pomona 606 Studio project. The project sought to transform park-poor and economically disadvantaged communities throughout Los Angeles by proposing the conversion of distressed, underutilized sites into public parks and green spaces (Red Fields to Green Fields n.d., Bertsch, Boucher, James, and Jones 2011). The purpose of the Red Fields to Green Fields movement is to convert individual red field sites into larger networks of green spaces. This closely aligns with both the AMP's vision of converting individual alley segments into larger networks of green alleys and streets, and with The Trust for Public Land's work under their Parks for People initiative to transform neglected sites into green spaces for ecological, social, and economic benefits (The Trust for Public Land 2012b). As such, the Red Fields to Green Fields effort served as a valuable precedent for the AMP.



FIGURE 2.20
GATED ALLEY IN THE PROJECT AREA



MILLION TREES LOS ANGELES INITIATIVE

In response to climate change and the rapid growth rate of the Los Angeles region, Mayor Antonio Villaraigosa passed the Million Trees Los Angeles Initiative in 2006. This initiative attempts to address the mounting challenges of improving air and water quality, alleviating water shortages, cooling urban heat islands, and reducing local flooding through the planting and stewardship of one million trees (McPherson et al. 2011, City of Los Angeles 2006). By planting one million trees throughout Los Angeles, the goal of the initiative is to create a base for environmental change and to transform Los Angeles into the largest, cleanest, and greenest city in the United States (City of Los Angeles 2006). The AMP supports the Million Trees Initiative by recommending street tree plantings as a means to improve hydrological function, increase pedestrian and bicyclist comfort, and decrease the urban heat island effect. (See also Chapter 3-A Biophysical Inventory: Vegetation and Wildlife.)

FIGURE 2.21
TREE PLANTING EVENT WITH MEMBERS OF THE LOS ANGELES CONSERVATION CORPS
Flickr.com/waltarrrrr 2009

CITY OF LOS ANGELES 50 PARKS INITIATIVE

Although the Los Angeles region may be abundant in large, mountainous park lands, it is considered park-poor in terms of neighborhood green spaces (Smith 2011). In a move to increase the number of green spaces in the City's most park-poor neighborhoods, Mayor Antonio Villaraigosa announced in November 2011 the City's 50 Parks Initiative, which proposes to build 50 new parks in Los Angeles over two years (Smith 2011). Of the 50 parks announced in 2011 to be built under the initiative, nine parks were located within the AMP project area. As of December 2011, the status of the nine parks varied with some in the grant cycle phase and others in the design phase. According to the December 2011 50 Parks Initiative Quarterly Update, six of the parks were funded (Kjer 2011). As part of the AMP's goal to create alley networks in the most park poor areas, network selection and recommendations respond to the plans for the nine 50 Parks Initiative projects that were located within the project area in 2011.

According to 2014 50 Parks Initiative project status information, 24 of the projects have been completed, and four of those are located within the AMP project area. The four new parks are 49th Street Park, 61st Street Park, McKinley Avenue Park, and Orchard Avenue Park. There are an additional three park projects in various stages of development within the AMP project area (Ford 2014).

The AMP project area contains two community plan areas – South Los Angeles and Southeast Los Angeles. The Los Angeles Department of City Planning has been updating the community plans for these areas. The updated South Los Angeles Community Plan and a draft Southeast Los Angeles Community Plan were released in October 2014. (Previous versions of the South Los Angeles Community Plan were referred to as the South Central Los Angeles Community Plan.)

The South Los Angeles Community Plan area, located approximately three miles southwest of Downtown Los Angeles, covers more than 15 square miles of land and applies to the AMP project area west of Interstate 110. It contains the AMP project area neighborhoods of Adams-Normandie, University Park, Exposition Park, Vermont Square, Harvard Park, and Vermont-Slauson. The Southeast Los Angeles Community Plan area includes the AMP project area east of Interstate 110, with the neighborhoods of Historic South-Central, Central Alameda, South Park, and Florence.

Both community plans follow the same format and contain topics that are relevant to green alley networks. The community plans discuss Community Themes, which highlight the valued qualities, visions, and strategies that are particular to each community (City of Los Angeles Department of City Planning 2014a and 2014b). New plans and developments within the community plan areas, including the AMP, should consider these themes. Some of the most relevant themes to the AMP include "Establish Transit-Oriented District Plans", "Develop a Sustainable Community", and "Create a Healthy Community" (City of Los Angeles Department of City Planning 2014a and 2014b).



A RESEARCH LIBRARY IN THE AMP PROJECT AREA

FIGURE 2.22

The community plans also include policies and design guidelines intended to guide decision-makers, designers, and the public toward achieving the goals set forth within each plan. The policies and guidelines are provided for land uses, special districts, historic resources, mobility, and community facilities and infrastructure (City of Los Angeles Department of City Planning 2014a and 2014b). Green alley network planning and design should be compatible and consistent with the policies and guidelines outlined in the Community Plans. In particular, those that are most relevant to the AMP relate to: parks, urban forest, motorized vehicles, bicycling, walking, water supply, stormwater, and street lighting.

The "Mobility" chapter within each of the community plans highlights the "complete streets" concept. The Community Plans support the citywide goal of "creating a street network that balances the needs of all roadway users, including pedestrians, bicyclists, transit riders, and motorists, and which values streets as public open spaces" (City of Los Angeles Department of City Planning 2014a, p. 4-1). The Community Plans propose "Priority Streets" with suggested modes of transportation to focus upon in the plan area. Green alley networks can provide infrastructure to appropriately support and supplement Priority Streets (City of Los Angeles Department of City Planning 2014a and 2014b).



FIGURE 2.23
THE NEW RITTENHOUSE SQUARE MIXED-USED RETAIL AND AFFORDABLE SENIOR HOUSING ON CENTRAL AVE AT 33RD STREET



GREENWAYS TO RIVERS ARTERIAL STORMWATER SYSTEM (GRASS)

Cal Poly Pomona's 606 Studio and the Bureau of Sanitation's Greenways to Rivers Arterial Stormwater System (GRASS) is noteworthy and similar planning project currently underway. The goal of this project is use nature as a model for enhanced connectivity and to develop lower-cost, and more effective BMP's. GRASS is a watershed-centric system of stormwater greenways that proposes and applies new City standards, and evolves through engagement and communication between Non-Governmental Organizations, the pro-practice community, and multiple City Departments (Deets and Milburn 2015).

In tackling these issues, Phase I of GRASS analyzed various criteria related to stormwater such as soils permeability, drainage areas and social equity and developed a comprehensive green network in the Upper LA River Watershed with the goal of determining multi-functional infiltration corridors that improve water quality, provide valuable open space, offer aesthetic benefits, and connect the many disjointed communities within the city. In particular, the focus of GRASS was on underutilized spaces, such as roadways, excess street medians, powerline corridors, non-motorized transit networks, and schools that can be holistically integrated through connectivity to improve the supply and quality of water, while also addressing social and economic challenges facing communities, such as park poverty. The Greenways to Rivers Arterial Stormwater System (GRASS) GIS Analysis is included in this document in Appendix M. This document however is the preliminary work of this project and a GRASS Phase II is pending in late summer of 2015 (Deets and Milburn 2015).

The process for Phase II (see process diagram in Appendix M) is based on qualitative and analytical cycles that lead to the creation of a scope of work that is the foundation of the GRASS II project. Vital data is used to run models built in ArcGIS to generate Stormwater Greenways that are then qualitatively revised by the GRASS II team of students and faculty. Public input and information is used to further refine the model until final Stormwater Greenway routes are generated based on both quantitative and qualitative data. This process is being engineered to more closely apportion local waters so that it serves the function of a neutral system, yet addresses the constraints of our urban infrastructure. Phase II of GRASS designates Stormwater Greenway spines extending from the mountains to the sea that function as contiguous arterial stormwater systems. Four corridors will be highlighted based on the ability to capture qualitative objectives within the geospatial analysis. The GRASS II network is more extensive than that used in GRASS I, as it encompasses the LA River, Ballona Creek and Dominguez Channel Watersheds. The two projects will propose the relationships between stormwater management and the urban environment that redefine local water use and benefit. (Deets and Milburn 2015).

The GRASS efforts are of particular importance to the efforts of the AMP. As cities are studied as a web of ecological processes, the implications of human activities and infrastructures manifest themselves as new physical realities. The global ecological footprint of cities is often much larger than the geographical terrain they occupy (Alberti et al. 2003), so new ways for mitigating humans' expanding influence must be developed. The AMP aims to rehabilitate the aging infrastructure of urban alleys and streets to be multi-beneficial elements within a multi-level city structure that supports human, environmental, and economic health. This, however, occurs at the micro scale while GRASS looks holistically at a far wider system of interrelated processes to address the same goals.

FIGURE 2.24
TREE CANOPY IN THE AMP PROJECT AREA

This AMP includes literature reviews on selected topics related to green alley networks. Stormwater management is discussed at length in the City of Los Angeles' *Green Streets and Green Alleys Design Guidelines Standards* (2009), which should be used as a source for stormwater information. However, the AMP addresses community issues beyond stormwater capture and treatment. The following reviews were included to help expand the discussion concerning green alley networks and the benefits they are capable of providing. The selected reviews are not a comprehensive review of relevant literature related to green alleys, but instead provide a focused examination of topics found to be of particular interest to the AMP including: 1) an assessment of urban forests, 2) the relationship between environmental design and crime, 3) greenway planning, and 4) human recreation in urban-residential alleys. Following are summaries of these reviews; please see Appendix O for the full reviews.

URBAN FORESTS

Defined as "all publicly and privately owned trees within an urban area—including individual trees along streets and in backyards, as well as stands of remnant forest" (Nowak et al. 2010, p. 3), urban forests are able to support two of the AMP's goals: 1) protecting and improving water supply and air and water quality through increased urban tree canopy, and 2) encouraging walking and bicycling through increased pedestrian and bicyclist comfort.

In light of climate change and sustainable development, the physical representation of urban forests is currently the focus of many environmental efforts. Urban forests are becoming widely accepted and referred to as "green infrastructure," recognized for their abilities to provide critical, multiple, and sometimes conflicting functions within urbanized systems of streets, buildings, and channelized rivers (Nowak et al. 2010, Oleyar, Greve, Withey, and Bjorn 2008). Listed below are some benefits of urban forests relevant to the AMP.

- Ecological benefits include rain capture, improved air quality, reduced urban heat island effect, reduced wind speeds, reduced ozone concentrations, improved wildlife and biodiversity, and improved soil quality.
- Economic benefits include increased property values and increased consumer friendliness.
- Social benefits include improved physical and mental wellbeing and increased open space use.
- Community benefits include reduced crime, reduced social strife, contributions to the character of a city or neighborhood, encouraged ownership, and promotion of a greater sense of community (McPherson et al. 2011, Nowak et al. 2010, Manning 2008).

As urban forests provide multiple benefits and have been proven to positively influence ecosystems, it is recommended that trees be a fundamental element in green streets projects (City of Los Angeles Department of Public Works Bureau of Sanitation 2009) and urban forests should be given a significant role within a city's infrastructure through investment, campaigns, community workshops, and master planning. Education and awareness strategies to augment the value of trees among South Los Angeles residents are part of the AMP's efforts.

ENVIRONMENTAL DESIGN + CRIME

Many of the alleys within the project area have a history of crime – burglary, assault, dumping, graffiti – and many of the residents who live alongside them are afraid to go into the alleys. Understanding the relationships between crime and the physical and social environments of the alleys is crucial to the AMP achieving its goals of reducing crime, improving safety, and providing space for active recreation. Based on a review of existing literature, the AMP considers: 1) territoriality, 2) surveillance, 3) image or maintenance and social ties, 4) lighting, and 5) recreation opportunities for youth as critical elements for improving safety in the alleys. Following is a brief description of each issue.

Territoriality

Territoriality refers to defining areas of space to reflect the influence of the inhabitants (Newman 1972). Oscar Newman explains, "for one group to be able to set the norms of behavior and the nature of activity possible within a particular place, it is necessary that it have clear, unquestionable control over what can occur there" (Newman 1972, p. 2). Territoriality can be established through both symbolic barriers, such as signage, and real barriers, including fences or other clear delineations between private, semi-private, and public spaces (Cozens et al. 2005).

Surveillance

Jane Jacobs (1961) is known for promoting "eyes on the street", and Oscar Newman (1972) also states the importance of the presence of pedestrians to the safety of streets. Surveillance can be increased by designing and maintaining the environment so that people within a space can easily be seen by others (McCormick 2006, Cozens et al. 2005). By increasing surveillance, the risk of an offender being seen, identified, and apprehended is also increased (Cozens et al. 2005, Poyner 1983).

Image, Maintenance, and Social Attachment

The image or maintenance principle states that an area that appears to be cared for and kept up will tend to deter vandalism and other acts of crime (Beard 2010, Cozens et al. 2005, Nassauer 1995).



FIGURE 2.25
RECREATION IN A PROJECT AREA ALLEY

This principle relates to both Nassauer's "Cues to Care" theory (1995) and to the much researched and developed "Broken Windows" theory by Wilson and Kelling (1982). Wilson and Kelling's research stressed the importance of the maintenance of the physical environment as an indication of social cohesion and informal social control (Wilson and Kelling 1982).

Lighting

A study in two residential neighborhoods in the United Kingdom provides evidence that increased street lighting can result in crime reductions (Painter and Farrington 2001). The study, which compared crime rates before and after lighting improvements were installed, found that not only did crime rates decrease in the neighborhoods with improvements, but the benefits were also observed in adjacent areas (Painter and Farrington 2001). Furthermore, a comparison of costs associated with crime and the costs of the lighting improvements revealed that savings from the reduced crime rate more than paid for the cost of the lighting project (Painter and Farrington 2001).

Opportunities for Youth Recreation

Studies that examine the relationship between recreation programs for youth and crime conclude that afterschool recreation opportunities in the community are likely to prevent juvenile crime (Jamieson and Ross 2007, Welsh and Hoshi 2002, Schinke, Orlandi, and Cole 1992). Therefore, ensuring that there are opportunities for youth recreation programs in a community is another way environmental designers can combine interventions in the physical environment with social programs.

Improving alley lighting and signage, integrating recreation opportunities for youth, encouraging increased care of private and public property, and fostering community involvement throughout all phases of the AMP may be feasible approaches for reducing crime in the alley networks.

GREENWAYS

Greenways, a term that combines greenbelt and parkway, can be described as:

- Linear spaces that provide for potential movement of people and species;
- Linkages, which make a system with unique properties that cities without linkages lack;
- Multi-functional spaces achieved through goal-setting, compromise, and compatibility as important parts of the planning process;
- Part of the sustainable development movement (despite a current lack of metrics to demonstrate their effects); and
- A strategy to protect and connect key parts of our landscapes, especially linear parts, which therefore can only complement comprehensive planning efforts (Ahern 1995).

Robert Searns (1995) identifies three generations of greenways, from pre-1700s efforts to those of the early 1990s. Early greenway planning included efforts up to 1960, when modern planning principles underwent large shifts (Searns 1995). Olmsted's Emerald Necklace in Boston is a classic example of early greenway planning. The second generation covers the period between 1960 and 1985, during which the popularity of greenways resulted from both a backlash against rapid post-war expansion and in support of a nascent movement encouraging outdoor recreation (Searns 1995). Following the second generation, the greenway concept experienced a resurgence starting in the mid-1990s resulting from several simultaneous sources including academia, grassroots community efforts, and governments of all levels from city councils to the President's Commission on American Outdoors. Just as greenways provide benefits at all scales to multiple user groups, their implementation can come from groups of all sizes.

Successful planning efforts allow greenways to connect not only non-linear open spaces, but also locally significant sites of ecological or cultural value. Linear open spaces of all scales have been considered greenways, from a daylighted urban creek that connects neighborhoods, to interstate trails along former railroad right-of-ways. Recreational and ecological values are both increased exponentially when they are planned and built as part of a regional system or network (Hellmund and Smith 2006, Erickson 2006).

Greenway planning can inform alley

redevelopment in the planning of pedestrian and bicyclist circulation, the goal of multi-functional designs that maximize benefits, and the creation of unique linkages.

HUMAN RECREATION IN ALLEYS

The Los Angeles landscape suffers from park poverty and lacks access to open spaces, leaving small urban spaces as increasingly important resources for urban communities. Pocket parks, parklets, green streets, and alleys are incorporated in city planning efforts focused on improving green infrastructure and open space distribution. As our understanding of the urban environment continues to expand, so do the discoveries of the complex interactions between urban systems, environmental health, and human well-being (Akers, Muhammad, and Corbie-Smith 2011, Wolch 2011, Dahmann, Wolch, Joassart-Marcelli, Reynolds, and Jarrett 2010, Alberti, Marzluff, Schulenberger, Bradley, Ryan, and Zumbrunnen 2003).

The cultural representation of a place, gender, age, race and ethnicity, sexual orientation, physical or mental disabilities, and socioeconomic status all contribute to and shape user experience and perception of the urban outdoors (Loukaitou-Sideris 2006). Research shows that small urban spaces including alleys, should be analyzed for both physical and social characteristics. Physically, these spaces should maintain or improve municipal utility and function as well as improve conditions for recreational or leisure use. Socially, these places should support and serve the needs of the community with sensitivity towards the specific demographic characteristics of the residents, both now and in the future. Following are descriptions of the types of recreation that alleys can support.

Routine Activity/Active Transportation

A study in Baltimore examined the relationship of activity to the built environment. Residents in walkable neighborhoods reported more walking to nearby destinations than residents in less walkable neighborhoods. This finding remained true regardless of neighborhood income levels and suggests that improved pedestrian infrastructure can benefit residents across the income spectrum (King, Sallis, Frank, Saelens, Cain, Conway, Chapman, Ahn, and Kerr 2011). Therefore, to effectively encourage walking, pedestrian infrastructure must support the intended use.

Coordinated or Social Recreation

In a study conducted in Boston, residents reporting higher levels of social cohesion were found to have elevated levels of perceived neighborhood safety, which potentially has positive implications for health and well-being (De Jesus, Puleo, Shelton, and Emmons 2010). In relation to the AMP, this study suggests that efforts to understand, address, and improve social cohesion in low-income neighborhoods will aid in elevating levels of perceived safety among residents, thereby creating a more neutral environment for outdoor recreation. In specific observance of the teen population, P. E. Owens (2002) describes the relationship between adolescent development and the built environment. Owens explains that teenagers and adolescents need public places for interacting with their peers, recreational opportunities, escape, and solitude (Owens 2002). Although adolescents are legitimate users of the public landscape, policy and design measures are often aimed at limiting or prohibiting teenagers from gathering in public spaces. For example, curfews are often used as a restrictive policy to control teen access to public spaces in favor of protecting private interests. However, these measures are strongly opposed by the American Civil Liberties Union as a violation of individual rights (Owens 2002). The AMP recommends design strategies aimed at creating constructive public spaces for youth to gather.

Independent or Unstructured Activity

Independent play allows children to experiment, discover, and interact with their environment on their own terms, which supports development and individual confidence (van Loon and Frank 2011). Alleys, streets, and vacant lots transformed into recreation opportunities can feasibly support independent play environments.



FIGURE 2.26
A BICYCLIST IN A PROJECT AREA ALLEY





INVENTORY

3. PROJECT AREA INVENTORY

The inventory process comprises one half of the research supporting the project analysis. This step informs designers and planners about existing conditions that directly influence what is incorporated into the proposed plan. Inventory both determines potential design form and identifies potential design factors, constraints, and opportunities for the location of facilities and the conservation of resources (Laurie 1976). A thorough inventory must be completed for any plan to be successfully integrated into existing neighborhoods, both in terms of technical feasibility and in congruence with the neighborhood character. The AMP inventory is organized in two broad categories: biophysical and sociocultural.



3-A. BIOPHYSICAL INVENTORY

Biophysical inventories cover both past and current conditions of site geomorphology, climate, hydrology, vegetation, and wildlife. While any comprehensive planning document must consider such factors, they become especially relevant for the AMP given that the key objectives relate to microclimate, air quality, and the hydrologic function and health of the project area and the watersheds that it involves. Such research allows the AMP to use current data in analyzing site conditions and estimating proposed benefits.

GEOMORPHOLOGY

TOPOGRAPHY

The Transverse Ranges are the northern backdrop to the Los Angeles Basin. Unlike most North American mountain ranges, they run west to east and, although they appear to be linked, are divided by active faults. Visible from the basin stretching west to east, are the Santa Monica, San Gabriel, and San Bernardino Mountain Ranges with the highest elevation in the San Gabriels at 10,064 feet on Mount San Antonio (more familiarly known as Mount Baldy), the third highest peak in Southern California (Schoenherr 1992). From Mount San Antonio, the elevation drops to about 1,100 feet at the base of the mountains and to about 300 feet just over 30 miles away in downtown Los Angeles (Veloroutes 2010).

FIGURE 3.1
EXAGGERATED TOPOGRAPHY
OF THE LOS ANGELES BASIN
photojournal.jpl.nasa.gov/catalog/PIA03348

The AMP project area slopes gently from the northeast to the southwest. The approximate high point is in the northeast corner, at an elevation of approximately 230 feet, and the approximate low point is in the southeast corner, at approximately 130 feet. This elevation change of 100 feet occurs over a distance of about 4.5 miles.

While this dramatic change in elevation between the basin and mountains offers striking views, it also plays a role in Los Angeles' infamously poor air quality. Sea-breeze circulation combined with mountain-flow circulation off the southern slopes of the San Gabriel Mountains and high barometric pressure leads to

pollutants trapped in inversion layers in the Los Angeles Basin, especially during summer months (Lu and Turco 1995).

SEISMIC ACTIVITY

Southern California is seismically active with many fault lines. The primary fault in California, the San Andreas, divides the San Gabriel and San Bernardino ranges (Schoenherr 1992) and lies approximately 35 miles away from the project area (Cole, Lynch, and King 2012). Major earthquakes that have struck the Los Angeles area include the 1994 Northridge earthquake, the 1987 Whittier Narrows earthquake, the 1971 San Fernando earthquake near Sylmar, and the 1933 Long Beach earthquake. While seismic activity is a regional concern, it is not seen as a major design consideration, both because there are no identified active faults within the project area (Figure 3.2), and because none of the soils identified on the site are subject to liquefaction.

SOILS

Soils of the Los Angeles Basin alluvial plains are largely composed of weathered sand and gravel – granitic material carried from the mountains by the Los Angeles River and its tributaries (Mesmer 1903). The soil survey for the Los Angeles area shows seventeen distinct soil classes (Mesmer 1903). The majority of the AMP project area has Hanford Fine Sandy Loam soils, with some small areas of Chino Silt



FIGURE 3.2
ACTIVE SEISMIC FAULTS IN THE AMP REGION



Loam (Figure 3.3) (Council for Watershed Health 2011). According to the USDA Official Soil Series Descriptions, Hanford Fine Sandy Loam is a deep, well-draining soil with moderate to rapid permeability (USDA 1999). Chino Silt Loam, however, is somewhat poorly drained at best, with moderately slow permeability (USDA 1997).

Soil class is an important factor for stormwater management. Fast-draining soils quickly transport water away from the surface; however, slow-draining soils more thoroughly remove pollutants from water as it filters (California State Water Resources Control Board 2012). The type of native soil will help dictate the most suitable low impact development best management practices (BMPs), for example whether to use an infiltration planter or a flow-through planter (City of Los Angeles Department of Public Works Bureau of Sanitation 2009). However, even if a soil is not ideal for the desired BMP, it may be amended to achieve the desired infiltration rate or to maximize pollutant removal (Farr 2008). While the project area in general has soils that are suitable for low impact development, when implementing the AMP a geotechnical analysis of each site will guide the best approach to take for each site's particular soil conditions.

HUMAN IMPACT

Development in Los Angeles has capped much of the soil profile with an impermeable layer of asphalt, concrete, and buildings. GIS data and satellite imagery reveals the predominance of this impermeable

FIGURE 3.3
SOIL CLASSES IN THE AMP PROJECT AREA

layer (Figures 3.4 and 3.9) and even the Los Angeles River is nearly completely impermeable today. The high percentage of impervious surfaces in Los Angeles redirects rainfall as it hits the impervious surfaces. Instead of percolating through the soil to restore groundwater, rainwater flows as stormwater runoff into an impervious storm drain system. It continues to the channelized Los Angeles River before exiting untreated into the ocean. Los Angeles is a region that is dependent on imported water, with limited expansion opportunity, and local water sources may be critical in the near future. Yet Los Angeles has effectively devised a system that sends water directly to the ocean instead of restoring its own groundwater supply. The AMP regards this situation as an opportunity to create remediation solutions within the realm of physical infrastructure. Equally important is the opportunity to undertake all phases of this project with the intention of educating project partners and neighbors about regional effects and implications.

GEOMORPHOLOGY DISCUSSION

Based on the research into the project area's geomorphology, the AMP emphasizes opportunities to increase surface permeability, and to remediate and restore natural infiltration where appropriate. The native soils and gentle slope of the project area are well-suited to infiltration, and stormwater BMPs can be implemented in alleys, streets, and vacant lots to disconnect from the existing expanse of impervious surfaces.

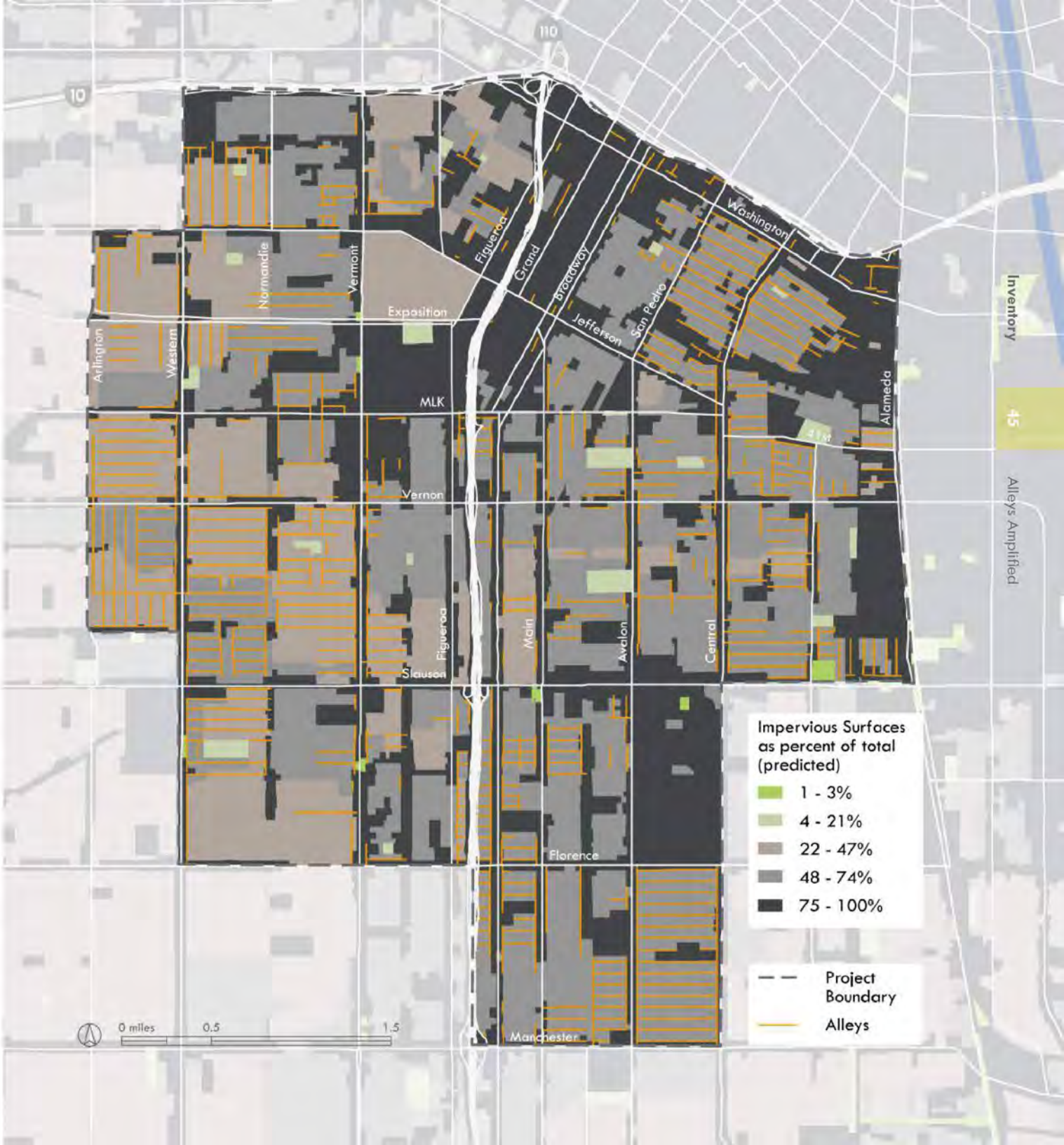


FIGURE 3.4
PERCENT IMPERVIOUS LAND COVER
IN THE AMP PROJECT AREA

CLIMATE

REGIONAL CLIMATE

The Los Angeles region is within the Mediterranean climate zone of Southern California. Mediterranean climates typically have dry summers and mild winters (McKnight and Hess 2000) (Figure 3.6). Through the changing seasons, precipitation varies more significantly than does temperature. Winter precipitation spurs new growth in vegetation, and the valleys and hillsides turn green in response. Rainstorms alternate with mild clear days and leave the mountains capped with snow. Warmer spring temperatures cause wildflowers to bloom and also bring fog along the coast. Summer is filled with warm to hot sunny days. In fall, Santa Ana winds flow through the mountain passes from the desert to the valleys and coast (Schoenherr 1992). Downtown Los Angeles' recorded mean annual precipitation is nearly 15 inches, but significant year-to-year swings in rainfall lead to either far more or far less than 15 inches of rainfall in any given year (National Oceanic Atmospheric Administration 2012) (Figure 3.5). Due to the unpredictable precipitation patterns, AMP design responses must accommodate extremely dry seasons and dry soil conditions, as well as the occasional moderate to high stormwater flows of flash flood events. These conditions make it difficult for much non-native vegetation to survive without irrigation.

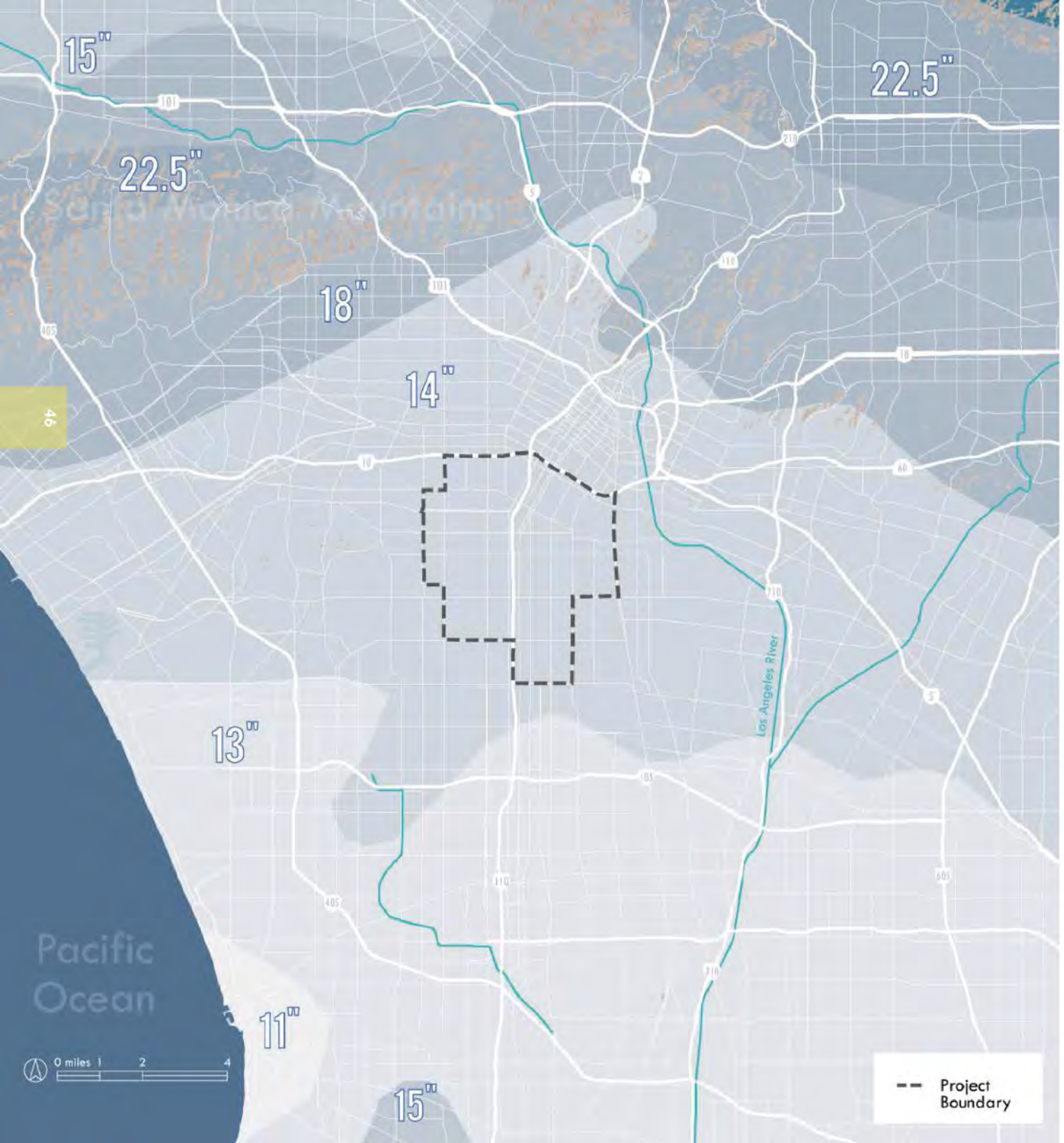


FIGURE 3.5
PRECIPITATION IN THE AMP REGION

HUMAN IMPACT

The amount of paved and built surfaces combined with the lack of an urban forest within the project area create the effects of an urban heat island (see the following Vegetation section and Appendix I). Urban heat islands trap heat, retain solar heating longer than natural surfaces do, and push rainfall downwind (Stone and Rodgers 2001) (Figure 3.7). Asphalt surfaces absorb and release heat throughout the day, increasing daytime temperatures. While concrete surfaces reflect more heat than asphalt, the heat that is absorbed is released more slowly, leading to increased nighttime temperatures. Rooftops that are flat or gently sloped and have a low solar reflectance, or albedo, also contribute to higher urban temperature (US Environmental Protection Agency 2011b). Increases in temperature create increased energy consumption through human efforts to control the comfort of indoor environments. This in turn drives higher levels of air pollutants and greenhouse gas emissions, as fossil fuel power plants work to meet the higher energy demands. Higher temperatures resulting from the urban heat island effect have a direct impact on human comfort and health, and sensitive populations (such as children, the elderly, or those with health conditions) are particularly at risk (US EPA 2011b).

As a major source of thermal heating, large areas of urban impervious surfaces can also threaten the health of cold-water ecosystems. The solar energy

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Average high °F	68.6	69.2	70.5	73.1	75	78.6	83.5	84.8	83.5	78.8	73.1	68	75.56
Daily mean °F	59.2	60.2	61.7	64.3	67	70.3	74.4	75.3	74.1	69.6	63.4	58.6	66.51
Average low °F	49.7	51.1	53	55.4	59	62	65.3	65.8	64.8	60.4	53.6	49.1	57.43
Precipitation inches	3.12	3.8	2.43	0.91	0.26	0.09	0.01	0.04	0.24	0.66	1.04	2.33	14.93
Avg. precipitation days	6.1	6.4	5.5	3.2	1.3	0.6	0.3	0.3	1	2.5	3.3	5.2	35.7
Mean monthly sunshine hours	225.3	222.5	267	303.5	276.2	275.8	364.1	349.5	278.5	255.1	217.3	219.4	3,254.20

FIGURE 3.6
SEASONAL TEMPERATURE AND RAINFALL IN LOS ANGELES (DOWNTOWN) 1981-2010

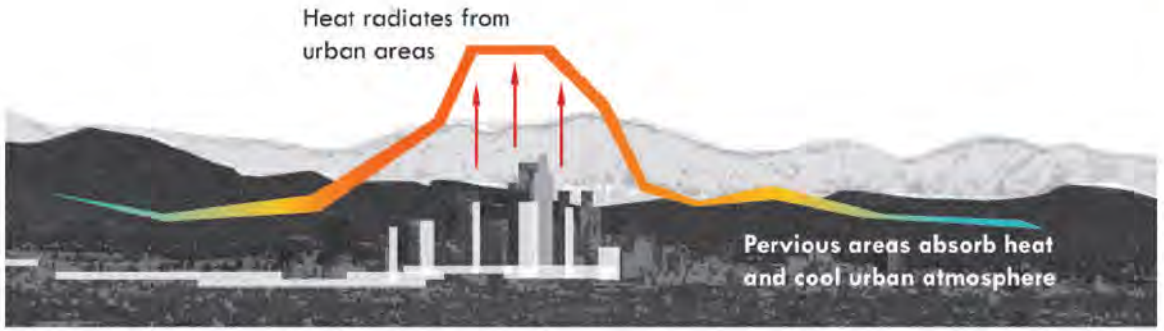


FIGURE 3.7
DIAGRAM OF URBAN HEAT ISLAND EFFECT

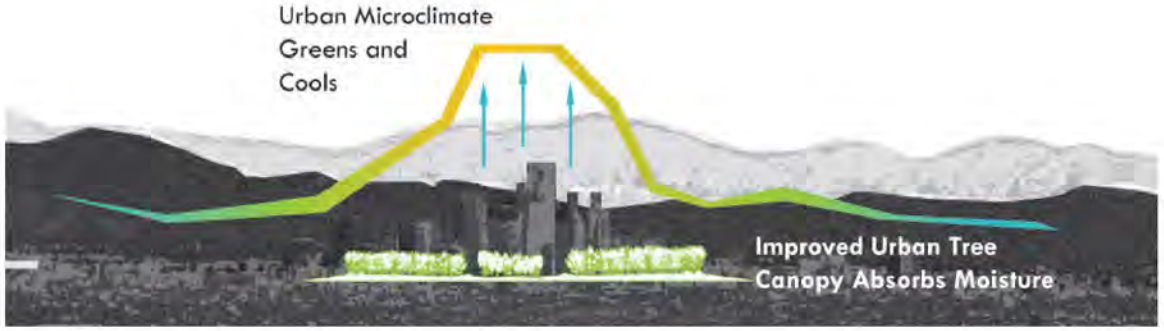
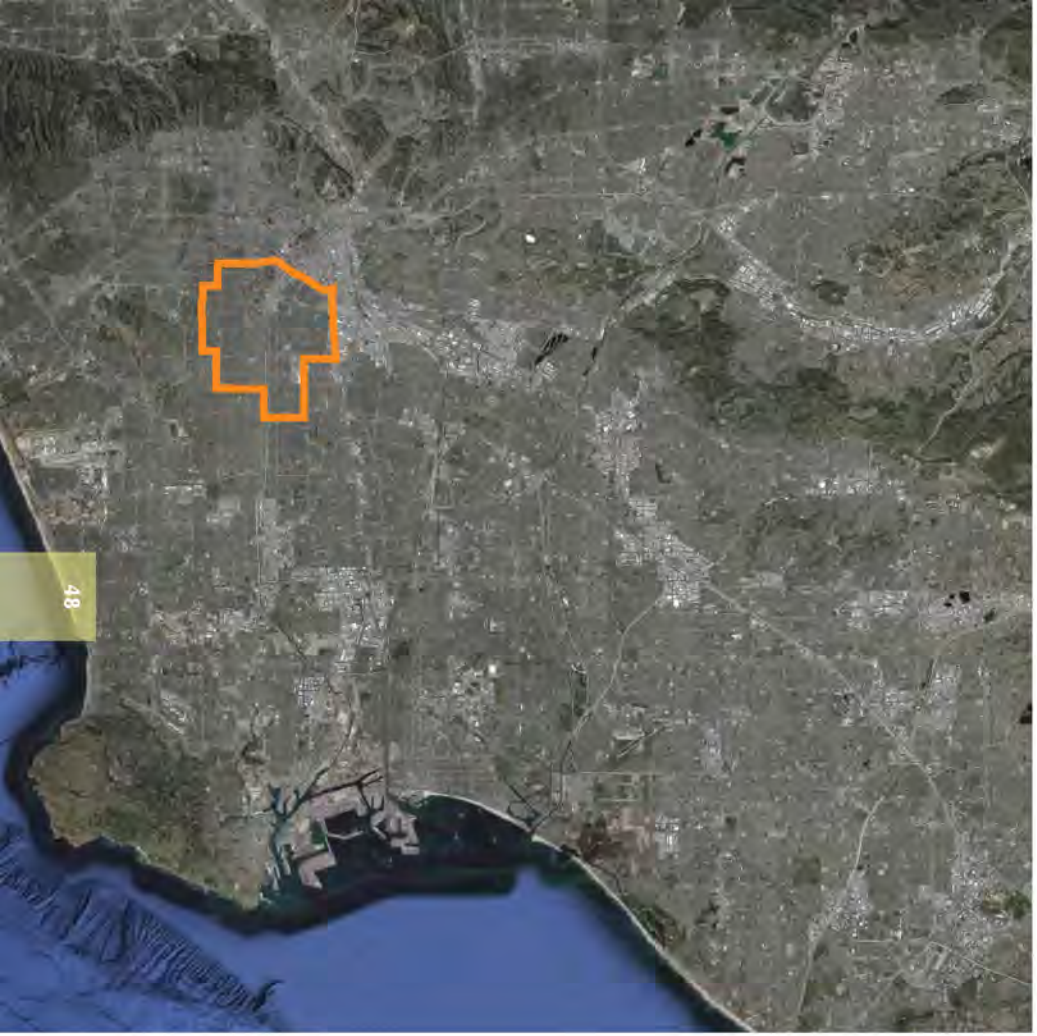
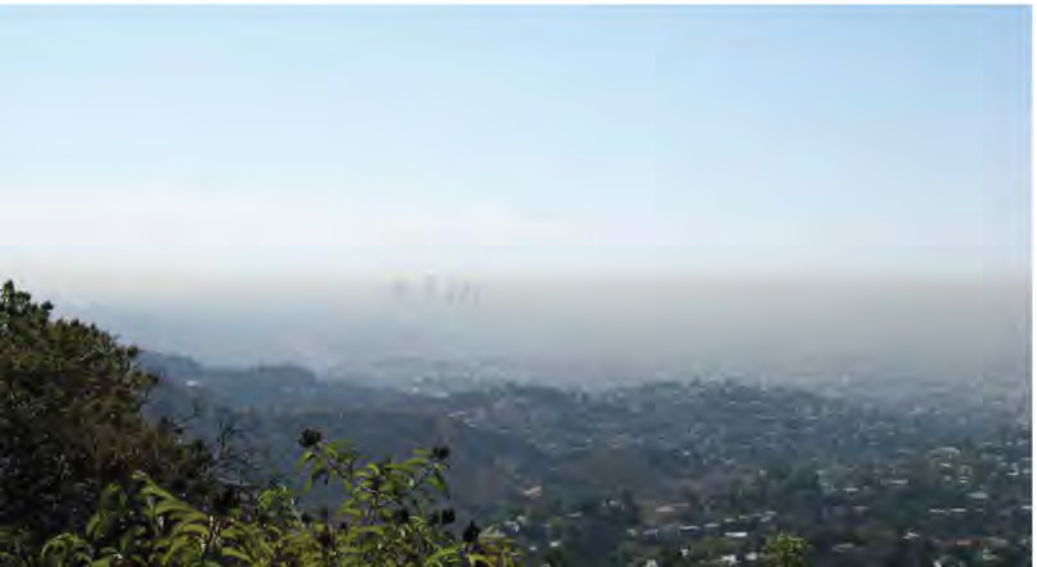


FIGURE 3.8
IMPROVED URBAN HEAT ISLAND CONDITION





absorbed by impervious areas is released as heat into water passing over these paved areas. Excessive heated runoff can permanently harm receiving waterways and can degrade habitat in the headwaters of streams in urban areas. Temperature is a key component of water quality and is instrumental to biochemical activity and habitat quality for every stream biota, from fish to macro invertebrates (Herb, Janke, Mohseni, and Stefan 2008, Jones 2008, Roa-Espinosa, Norman, Wilson, and Johnson 2003). Section 502 (6) of the federal Clean Water Act considers heat to be a water pollutant (University of New Hampshire Stormwater Center 2010). The elevated runoff temperatures resulting from large impervious surface coverage occur in tandem with reduced infiltration, which in turn increases runoff volume, exacerbating temperatures of receiving water bodies.

The combination of seasonal winds and topography in Los Angeles results in increased levels of pollution becoming trapped in the air (Lu and Turco 1995). According to the California Air Resources Board, "in terms of air pollution potential, there are probably few areas less suited for urban development" than the South Coast Air Basin (of which Los Angeles is a part) (Cox, Delao, Kormorniczak, and Weller 2009, p. 4-4). Ozone, or smog, forms easily in warm sunny weather and persistent high-pressure systems, and pollutants are trapped close to the ground by the combined factors of the "surrounding mountains, frequent low inversion heights, and stagnant air conditions" (Cox et al. 2009, p. 4-4) (Figure 3.10). These conditions have resulted in some of the highest pollutant concentrations in the nation in Los Angeles (Cox et al. 2009). Because Los Angeles' poor air quality is due in part to its natural physical conditions, user comfort and remediation of air pollution should be considered at all scales, as well as in all long-term planning efforts.

FIGURE 3.9
IMPERVIOUS DEVELOPMENT OF THE LOS ANGELES REGION

FIGURE 3.10
SMOG OVER LOS ANGELES

CLIMATE DISCUSSION

Climate has an effect not only on the function of ecological systems, but also upon human health and comfort (Corvalan, Hales, and McMichael 2005). The AMP addresses the issues of the urban heat island effect and air pollution through proposed increases in vegetation and permeable surfaces. Such interventions can help mitigate the effects of the urban heat island (McPherson et al. 2011), improve ecosystem functioning (Nowak et al. 2010), reduce air pollution (Nowak, Crane, and Stevens 2006), and provide a more comfortable human environment (McPherson et al. 2011, City of Los Angeles Department of Public Works Bureau of Sanitation 2009, Oleyar et al. 2008, Payton, Lindsey, Wilson, Ottensmann, and Man 2008, Wolf 2005, City of Los Angeles Department of City Planning 2000).

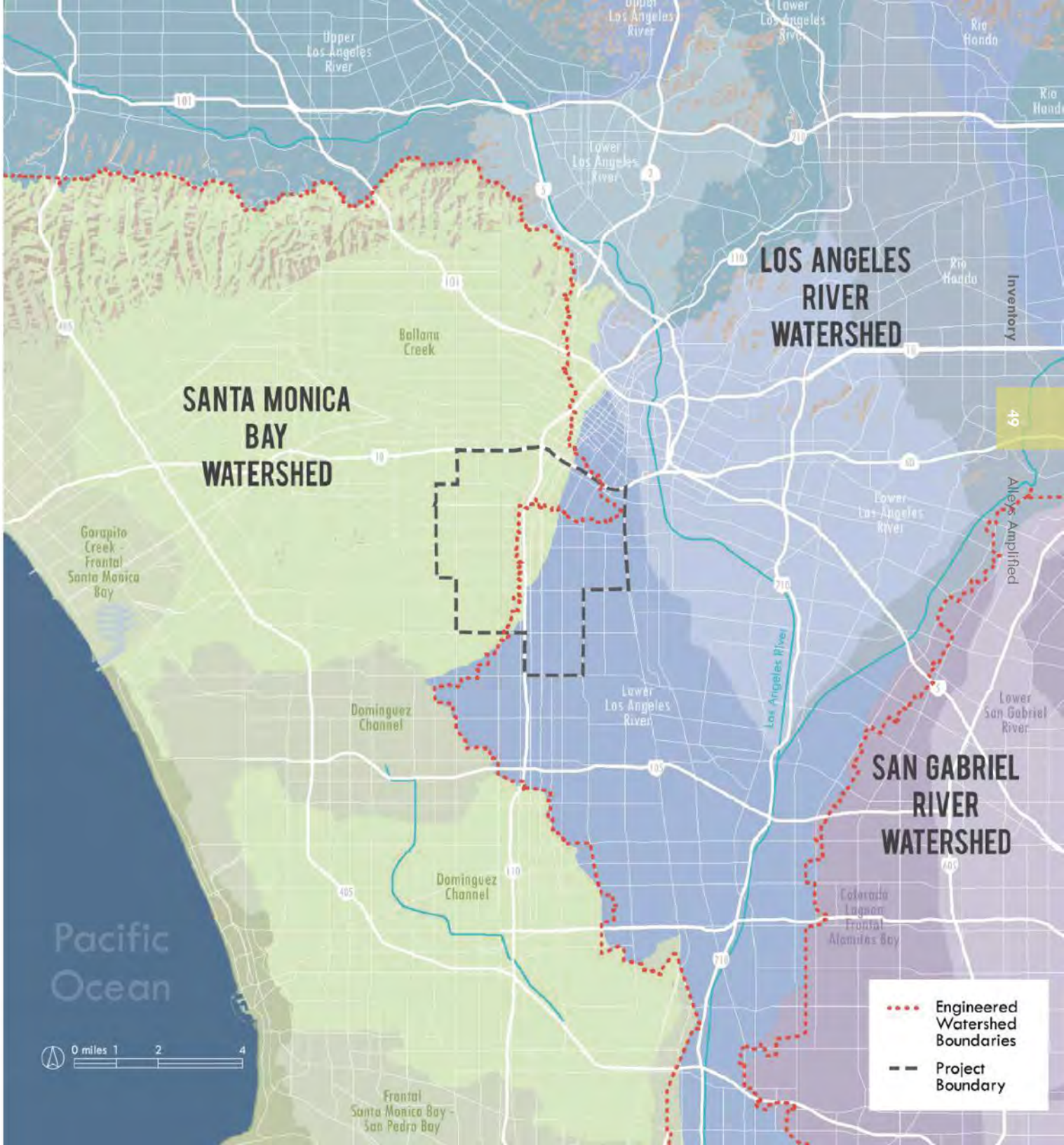
HYDROLOGY

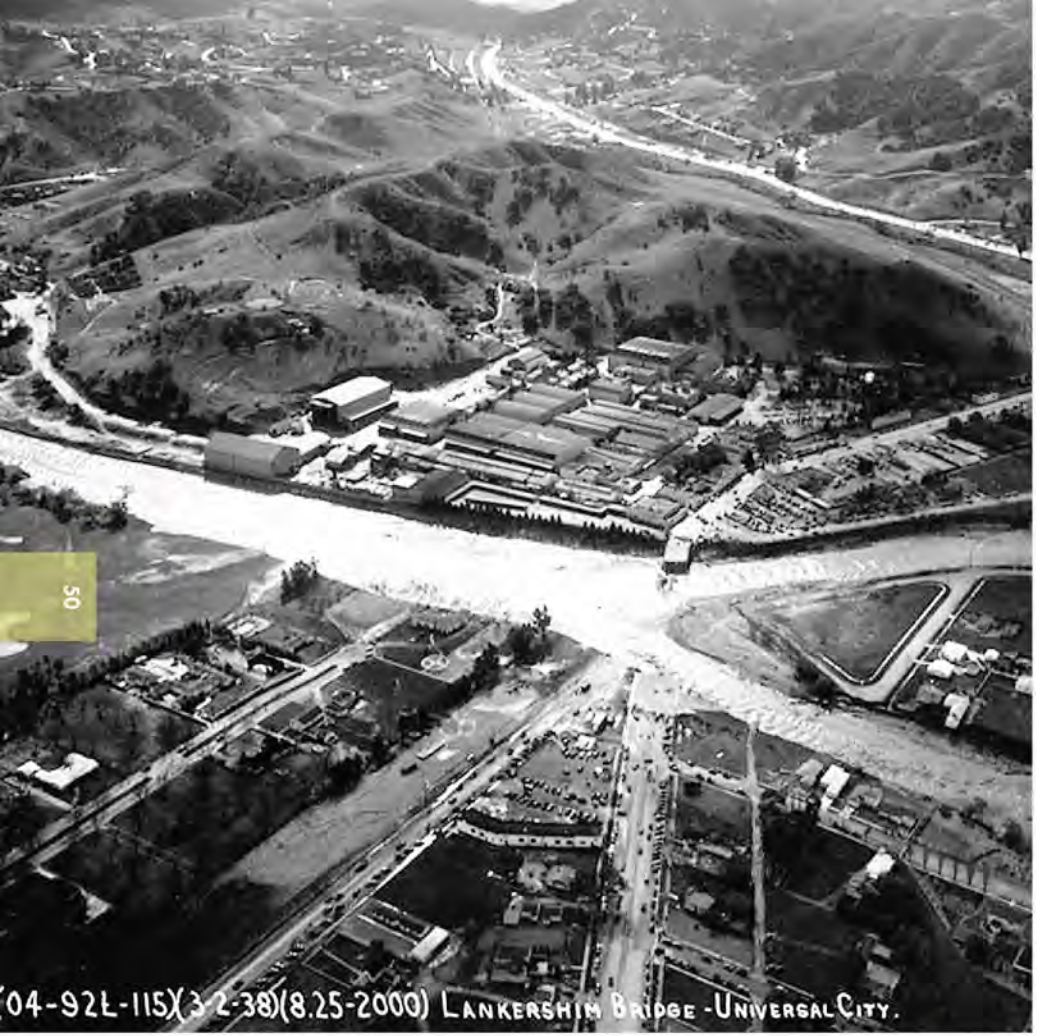
WATERSHEDS

In the Los Angeles Basin, rainwater flows from the San Gabriel Mountains to the Pacific Ocean in three major watersheds (Figure 3.11) – the Los Angeles River, the San Gabriel River, and the Santa Monica Bay Watersheds (LADPW n.d.a). A watershed is typically considered to include the area defined by natural topography that drains to a specific point. An engineered watershed however, is mostly defined by the alterations made to the natural topography (LADPW 2003).

The project area falls on the division between the Ballona Creek Watershed (within the Santa Monica Bay Watershed) and the Compton Creek Subwatershed, which is part of the Lower Los Angeles River Watershed. While water within the project area once naturally drained southward or westward, it now quickly enters the storm drain system and is transported either westward, emptying into Santa Monica Bay at the mouth of Ballona Creek, or southward and eastward emptying into San Pedro Bay at the mouth of the Los Angeles River. The project area's location in the upper portions of both the Ballona Creek Watershed and the Compton Creek Subwatersheds provides potential benefits for downstream water quality through a reduction in peak flows, a reduction in downstream water temperature, and the capture and treatment of pollutants higher in the watershed (Anoka Conservation District 2011, University of New Hampshire Stormwater Center 2010).

FIGURE 3.11
WATERSHEDS IN THE AMP REGION







FLOODING

The Los Angeles River runs 51 miles, from its headwaters in the San Fernando Valley to its outflow into the Pacific Ocean at Long Beach Harbor (City of Los Angeles 2007), capturing water from the 834 square miles of its watershed (LADPW n.d. a). Today, 95% of the river's dry season flow is treated sewage (Davidson 2001).

Historically, parts of the Los Angeles River flowed largely as an underground stream with only trace amounts of surface flow in the summertime, but with regular flood events during the winter. The river could change its course annually, from flowing west into what is now Ballona Creek, then flowing south, approximating its current channelized flow pattern (LADPW n.d.b).

When European explorers first came to Los Angeles, the Los Angeles River was one of the few distinguishable features of the landscape, and soon became the site of the most prominent settlements by both native and settler populations. After the river channel had been designated as a utilitarian shipping connection to the port in San Pedro, industrial uses such as railroad tracks, power lines, and support facilities were constructed along its banks, thereby removing any remnant vegetation (Los Angeles River Revitalization Corporation 2011, Golding 1999). Lack of recognition of the Los Angeles River's seasonal nature and periodic flooding and the threat the river posed resulted in continued development in the flood plain (Golding 1999). Large floods damaged infrastructure, homes, and businesses several times in the first half of the 20th century, especially in 1914, 1934, and 1938 (City of Los Angeles 2007) (Figure 3.12).

FIGURE 3.12 (TOP)
FLOODING IN 1938

FIGURE 3.13 (BOTTOM)
STORM FLOW IN THE LOS ANGELES RIVER, AT FIRESTONE BLVD BRIDGE 1958

Both images: Los Angeles Public Library Photo Collection

As local flooding came to be considered a genuine threat to both local and national economies, planning discussions focused on ways to contain the threat rather than ways to avoid it through development strategies. The repeated devastation instigated construction of concrete channels by the U.S. Army Corps of Engineers and the Los Angeles County Flood Control District. These channels, which straightened and deepened the river's banks, were completed over decades of infrastructure work, mostly between the late 1930s and the late 1950s (LADPW n.d.b). The Los Angeles River as well as most other large rivers in the metropolitan region are now channelized (Los Angeles River Revitalization Corporation 2011, Gumprecht 2001).

Within Los Angeles County, 571 miles of waterways have been channelized (SWA 2012). The Los Angeles River's banks are lined with concrete along nearly its entire length, and in only three areas is the channel's bottom not paved: the Sepulveda Flood Control Basin in the San Fernando Valley, near Griffith Park through the Elysian Valley, and at the estuary in Long Beach, where the river empties into the Pacific (LADPWb n.d.).

The river's underground sources were diverted into wells, several of which are

now EPA Superfund sites (Davidson 2001). By the mid-twentieth century, the Los Angeles River had become one of the least noticeable features of the landscape.

The paved channels present negative effects for hydrologic and ecosystem function, and for human health, safety, and well-being. Channels alone cannot prevent flooding, although, under certain conditions, they may reduce upstream flooding and property damage (Shankman 1996, Shankman and Samson 1991). Paved channel surfaces increase floodwater velocities, which may result in increased flood damage in downstream unchannelized sections or should floodwaters breach the channels (Shankman 1996, Shankman and Samson 1991, Ritter 1979). The channels' heat-absorbing concrete, together with the associated reductions in vegetation and tree canopy, increase urban heat island effect, while removing and preventing both aquatic and riparian habitat (Shankman 1996, Brooker 1985). The loss of habitat, in turn, means a reduction in access to open space for local citizens (Brooker 1985). The amount of urban impermeable surfaces plays a large role in both the dangers of flooding and the ecological effects of concentrated stormwater (Konrad 2003).

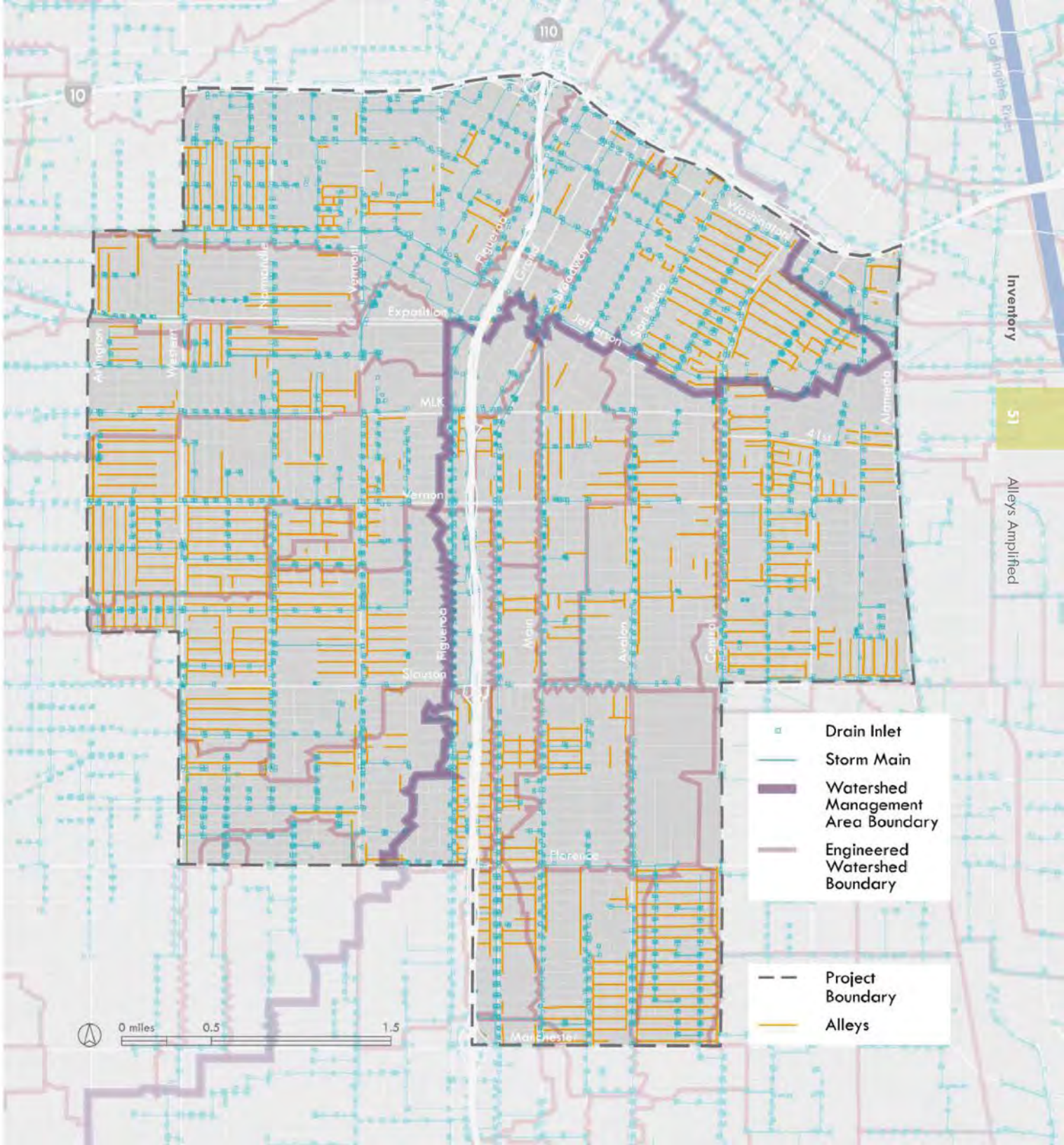


FIGURE 3.14
STORM DRAIN SYSTEM
IN THE AMP PROJECT AREA





FIGURE 3.15
EXISTING DRAINAGE CONDITIONS IN ALLEYS

STORMWATER INFRASTRUCTURE

Records from the City of Los Angeles Department of Public Works show that the project area is served by storm drain infrastructure owned by at least three agencies: the City of Los Angeles, the County of Los Angeles, and the State of California (City of Los Angeles Department of Public Works Bureau of Engineering 2009). Los Angeles County GIS staff confirms that multiple agencies historically have constructed overlapping infrastructure throughout the County, and that this can be an issue for inventory and record-keeping (Browne 2012). This multi-agency arrangement also presents a challenge to the goal of efficient and comprehensive system maintenance.

Most arterial streets and thoroughfares within the project area are served by storm drains and drain inlets. Some residential blocks within the project area do not have drain inlets, but rather drain to inlets located in nearby arterial streets (Figure 3.14). New low impact development (LID) stormwater infrastructure has the potential to capture and reduce runoff in these neighborhoods, and can provide a relatively high benefit to investment ratio. However, all infiltration BMPs need an overflow to the existing stormwater infrastructure.

Compared with the level of detail available on stormwater flow direction in city streets, the City has comparatively little information about alley drainage patterns (City of Los Angeles Green Streets Committee 2012). No available information was found to determine the number of existing drain inlets that are located entirely within alleys, or that serve only alleys. A thorough inventory process, including site visits to hundreds of alleys, found very few drain inlets in alleys in the project area.

Because of the generally flat condition of most project area alleys, site drainage patterns are not always evident through site visits alone. Drainage conditions vary across the site as much as paving conditions do. Some alleys are asphalt with center concrete swales, others drain along their centerline without a swale, and some are so flat they appear to drain to either side into residential yard space. The condition of many alleys is such that water does not drain from the pavement surface, but rather pools, while still other alleys remain completely unpaved (Figure 3.15). Some adjacent parking areas appear to drain into the alleys, but many alleys have portions that drain onto private property. By visiting and assessing the conditions of approximately 80% of the project area alleys, it is estimated that 25% of project area alleys are currently in need of significant paving repair.

While Figure 3.14 shows the boundaries of macro-engineered subwatersheds, City records detail the boundaries of sub-units of each of those subwatersheds. These boundaries have been designed to minimize flooding during storm events large enough to create significant surface flow. As such, major stormwater flow modifications should avoid directing stormwater across existing subwatershed boundaries when feasible (City of Los Angeles Green Streets Committee 2012). Because infiltration techniques can remove stormwater from the storm drain system, such concerns will not be significant in every situation, and will need to be assessed during site-scale analysis and design.

GROUNDWATER RECHARGE

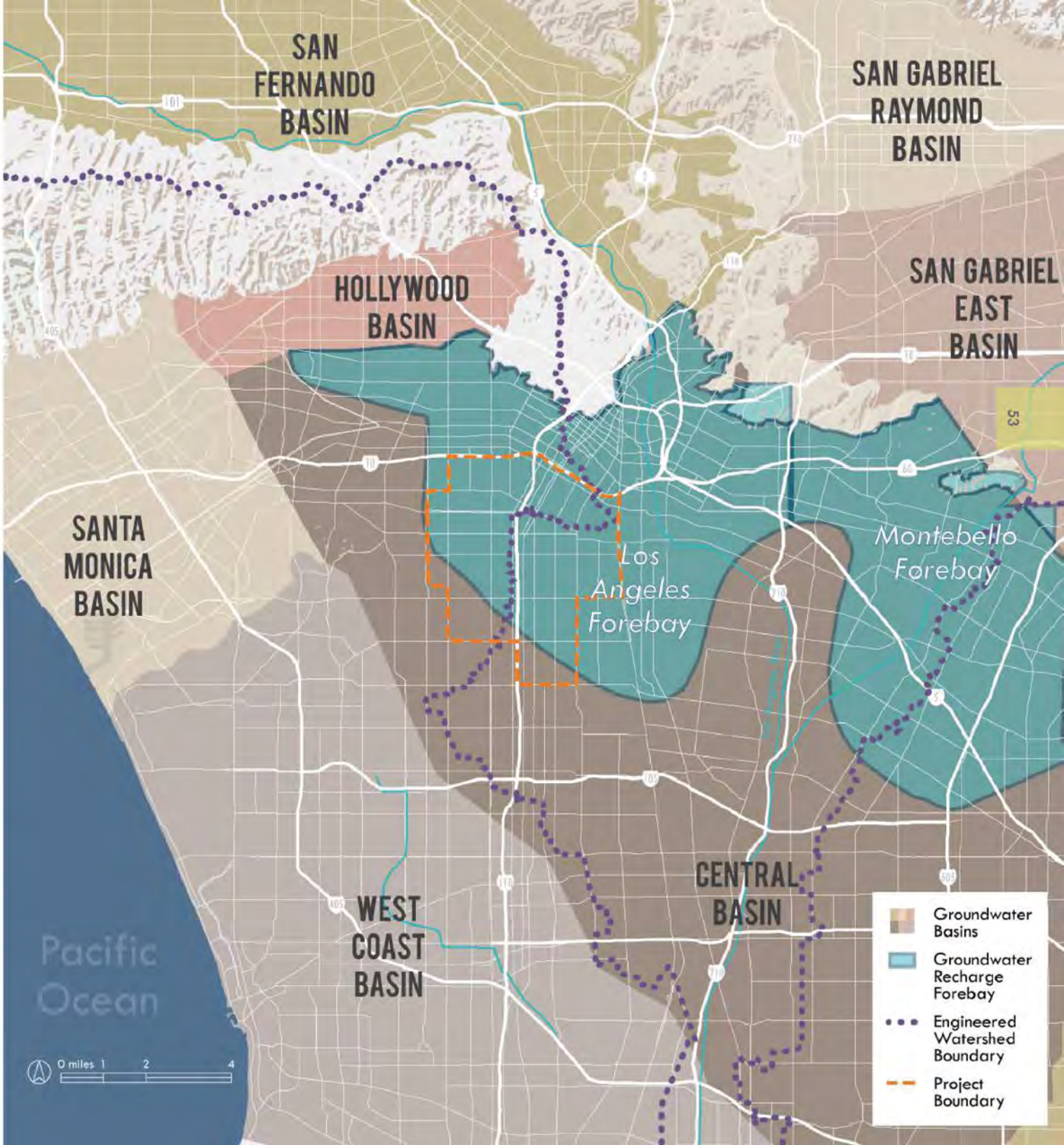
The project site is situated within the Central Sub-basin of the Coastal Plain of the Los Angeles Groundwater Basin, commonly referred to as the Central Basin (California Department of Water Resources 2004). The Central Basin is composed of several forebay areas and pressure areas. Approximately 85% of the project area is situated over the Los Angeles Forebay in the northwestern part of the Basin (Figure 3.16). This is an area with unconfined aquifers, also known as water table aquifers, which typically exist close to the ground surface, are capable of storing and releasing larger quantities of groundwater, and allow percolation into deeper aquifers which replenish the Basin (City of Los Angeles Department of City Planning 2010a, Brutsaert 2005, California Department of Water Resources 2004, Johnson 2004). The Los Angeles forebay's aquifers extend as much as 1,600 feet deep (California Department of Water Resources 1961 cited in City of Los Angeles Department of City Planning 2010a).

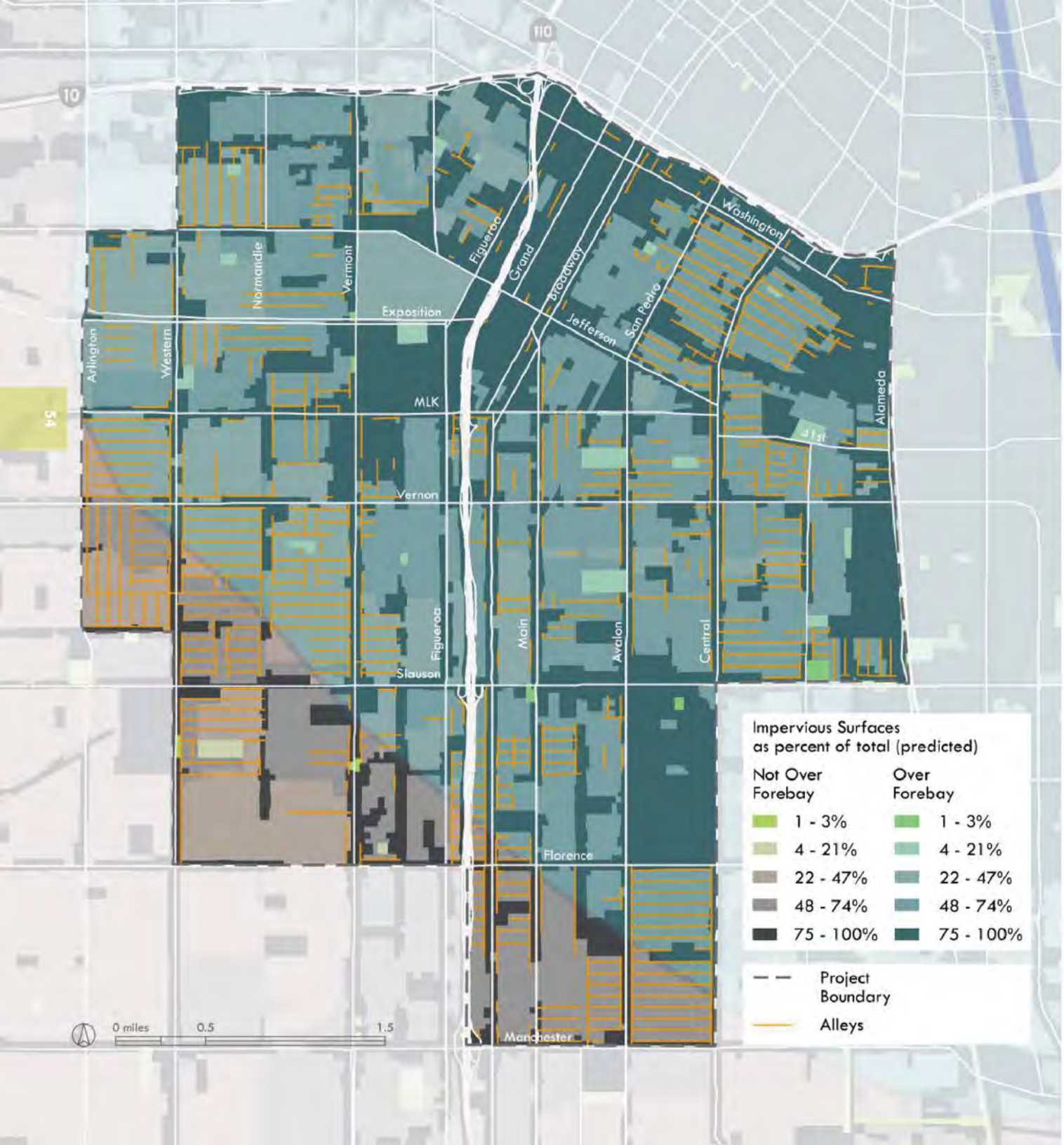
The southwest portion of the project area, approximately 15% of its total area, is over the Central Basin pressure area (Figure 3.16). Groundwater enters the Central Basin through

surface flow, subsurface flow, and through infiltration of all types of surface water, including imported water such as residential irrigation. Surface water typically replenishes aquifers in forebay areas (California Department of Water Resources 1961 cited in City of Los Angeles Department of City Planning 2010a). Infiltration into the Los Angeles forebay is mostly inhibited by the large amount of impermeable surface cover. In such situations, imported water is often used for artificial recharge (City of Los Angeles Department of City Planning 2010a) (Figure 3.17). Historically, low aquifer levels have contributed to Southern California's need to construct enormous water importation infrastructure (LADPW 2003). Although little stormwater currently recharges the groundwater, impermeable surfaces may act to prevent polluted stormwater runoff from contaminating groundwater supply under certain conditions (Aida, Zhou, Zhou, and Dong 2009).

The City of Los Angeles' standard practices restrict stormwater infiltration BMPs to areas with a groundwater depth of at least ten feet. Groundwater depth and soil type are key determinants of types of BMPs available, BMP design, and potential infiltration rates (City of Los Angeles Green Streets Committee 2012). Groundwater levels vary across the project area, and are in a constant state of change. A review of groundwater levels for the most recent five years of available data showed few portions of the project area as having less than ten feet predicted groundwater depth. However,

FIGURE 3.16
FOREBAY IN THE AMP REGION





the 2010-2011 study suggests that the northwestern portion of the project area had some locations with groundwater within ten feet of ground surface (Water Replacement District of Southern California 2012, 2011, 2010, 2009, 2008). Depth tests should be conducted to determine the proximity of the water table prior to the design of specific infiltration BMPs.

WATER POLLUTION

Precipitation in the project area falls upon a site which is largely flat and nearly entirely developed. Most precipitation falls in areas without enough slope to provide a natural flow, which can lead to water stagnation and flooding. The current storm drain system is designed to quickly and effectively remove water from city surfaces, but leaves pollutants in the flow. Pollutants from every land use in Los Angeles make their way to the Los Angeles River, Ballona Creek, and the Pacific Ocean (LADPW 2003).

State and federal laws determine water pollutants by which substances can render water harmful to people or wildlife, or can impair specified beneficial uses of water. The quality of water is measured in many ways including temperature, clarity, the presence of chemicals, and the presence of harmful bacteria (Kocher and Harris 2007). A common division of water pollutants is between point source pollutants and nonpoint source pollutants. Point source pollution generally refers to non-moving sources,

FIGURE 3.17
COMPARISON OF FOREBAY LOCATION AND PERCENT IMPERMEABLE LAND COVER

those which are discernible, confined, and discrete. Nonpoint source pollution are all other types of pollution and come from many diffuse sources, including but not limited to runoff, drainage, or seepage (US EPA 2012a). Impervious surfaces commonly increase sediment, nutrients, and pollution in receiving waters (Roa-Espinosa, Norman, Wilson, and Johnson 2003), thereby leading to contributions from polluted urban stormwater runoff to all of the most common categories of nonpoint source water pollution (Harper 2005, US EPA 1983). These include:

- Oils and greases,
- Heavy metals (e.g. lead, copper, zinc),
- Suspended solids and sediment,
- Oxygen-demanding substances,
- Nutrients, and
- Bacteria and pathogens.

Typical industrial point sources of water pollution include: gas stations; car washes; automobile repair shops; automobile salvage operations; garbage collection and landfill operations; exterior storage operations; industrial pumping; industrial storage; industrial cleaning; welding; and miscellaneous industrial activities (Oregon Department of Environmental Quality 2001) (Figure 3.18).

The Los Angeles County Department of Public Works provides data covering cumulative event mean concentrations of stormwater pollutants during the 1994-2000 storm seasons (LADPW n.d.c) (see Chapter 4 Network Selection). Low impact development (LID) stormwater best management practices (BMPs) are highly varied in their capabilities to remediate or remove particular types of stormwater pollutants. Therefore on-site soil and stormwater testing should be performed prior to site-scale design in order to determine the most effective BMP implementation.

HYDROLOGY DISCUSSION

The AMP project area is almost entirely impermeable and its original hydrological function has been distorted. The AMP identifies opportunities to improve the hydrological function of two watersheds and to recharge the groundwater forebay.

Figure 3.14 shows that areas up to 100 acres in size lack drain inlets and are underserved by the current storm drain infrastructure. Similarly, the drainage of most alleys has been given few resources, as evidenced by residents' complaints of seasonal flooding. Commonly accepted LID BMPs, including infiltration, can have significantly lower lifetime costs than the expansion of the existing storm drain infrastructure. Conditions for many sites are appropriate for a combination of both types of stormwater infrastructure.

The AMP can reduce the future demand for the type of heavily engineered hydrological systems in use today. Through careful analysis and selective use of infiltration BMPs, LID strategies can also help recharge groundwater aquifers, while helping to remove multiple types of water pollutants found in runoff.

Today, city planners and citizens alike are aware of the ecological damage of previous infrastructure strategies, and are looking for opportunities to restore natural hydrological regimes to their city, regardless of the scale of the proposed project. This is evidenced by both the political will and the closely associated community design processes that guided the successful Augustus Hawkins Nature Center and the South Los Angeles Wetland Park. The AMP aims for tangible benefits by means of a series of smaller, coordinated planning efforts.

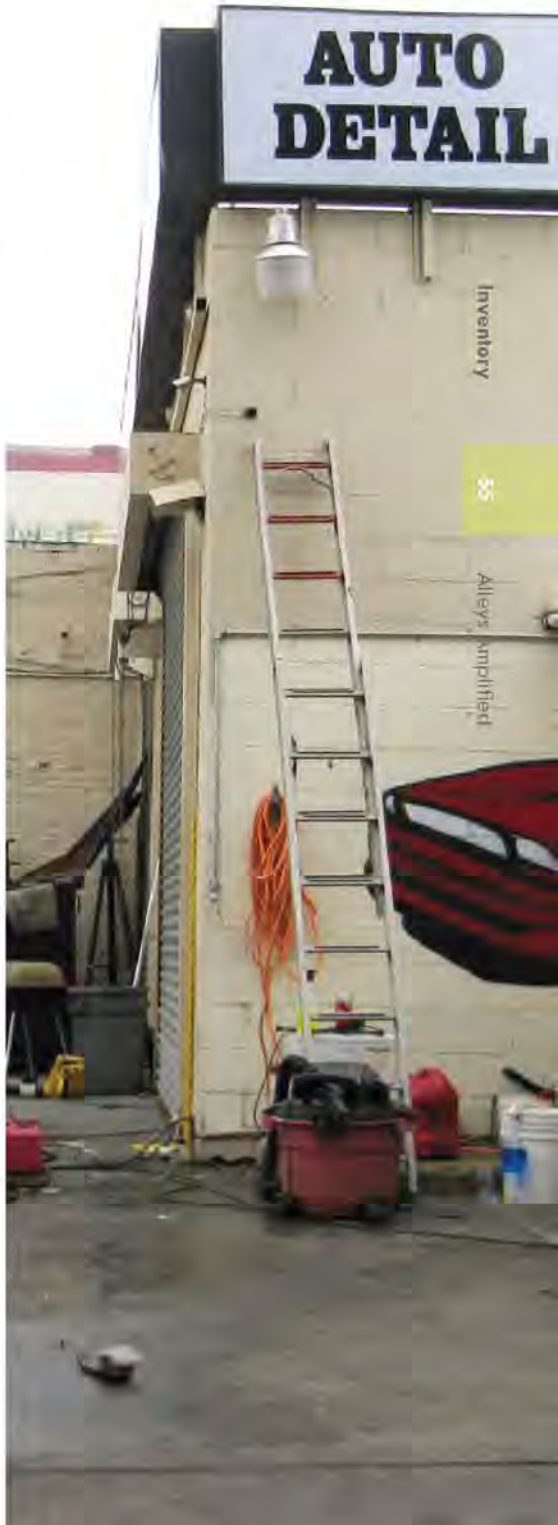


FIGURE 3.18
POINT SOURCE POLLUTION



NATIVE WILDLIFE

Reptiles	
Uta stansburiana	Side-blotched Lizard
Sceloporus occidentalis	Western Fence Lizard
Cnemidophorus tigris	Western Whiptail
Cnemidophorus hyperythrus	Orange-throated Whiptail
Phrynosoma coronatum	Coast Horned Lizard
Xantusia vigilis	Desert Night Lizard
Lampropeltis getulus	Common Kingsnake
Masticophus lateralis	Striped Racer
Thamnophis spp.	Garter Snakes
Salvadora hexalepis	Western Patch-nosed Snake
Pituophis melanoleucus	Gopher Snake
Arizona elegans	Glossy Snake
Lichanura trivirgata	Rosy Boa
Crotalus viridis	Western Rattlesnake
Crotalus mitchelli	Speckled Rattlesnake
Birds	
Aphelocoma californica	Western Scrub Jay
Toxostoma redivivum	California Thrasher
Chamaea fasciata	Wrentit
Pipilo erythrophthalmus	Rufous-sided Towhee
Pipilo crissalis	California Towhee
Callipepla californica	California Quail
Melanerpes formicivorus	Acorn Woodpecker
Zenaida macroura	Mourning Dove
Colaptes auratus	Northern Flicker
Camphlorhynchus brunneicapillus	Cactus Wren
Bubo virginianus	Great Horned Owl
Buteo jamaicensis	Red-tailed Hawk
Buteo lineatu	Red-shouldered Hawk
Mammals	
Peromyscus spp	Deer Mouse
Neotoma Lepida	Desert Woodrat
Notiosorex crawfordi	Desert Shrew
Dipodomys spp.	Kangaroo Rats
Perognathus spp.	Pocket Mice
Peromyscus spp.	White-Footed Mice
Odocoileus hemionous	Mule deer
Canis latrans	Coyote
Urocyon cinereoargenteus	Gray Fox
Lynx rufus	Bobcat
Bassoriscus astutus	Ringtail
Ursus arctos	Grizzly Bear





TABLE 3.19
COASTAL SAGE
SCRUB WILDLIFE

VEGETATION AND WILDLIFE

PRE-HUMAN DEVELOPMENT

The vegetation of the Los Angeles Basin, along with much of the rest of coastal Southern California, was characterized by dense stands of brush known as chaparral (Schoenherr 1992). In particular, the lower elevations and alluvial soils of the Los Angeles basin supported the Coastal Sage Scrub, or soft chaparral, plant community (Las Pilitas n.d., Schoenherr 1992). Plants of this community are drought-adapted (many are drought-deciduous), relying on the fog, high humidity, and moderate temperatures of the maritime environment (Schoenherr 1992). *Artemisia californica* (California sagebrush) is just one of the indicator species of Coastal Sage Scrub (Schoenherr 1992). Refer to Table 3.20 for other plants commonly found in this community.

California's Coastal Sage Scrub provides ample food and shelter for a variety of wildlife. Birds of the chaparral are typically omnivorous, eating berries and acorns when they are in season, as well as insects. During droughts they rely on these foods for water (Schoenherr 1992). Coastal Sage Scrub is also home to a greater variety of small rodents than any of the other scrub communities in California (Schoenherr 1992). However large mammals, particularly predators, are rare because there is simply not enough live animal biomass to support large populations (Schoenherr 1992). Refer to Table 3.19 for some of the wildlife native to California's Coastal Sage Scrub.

HUMAN IMPACT

Many Coastal Sage Scrub animal populations face the threat of habitat destruction from development, pastures, and agriculture, as well as the transformation of habitat through fire suppression practices (Schoenherr 1992). Furthermore, many stream courses that once supported wildlife have been channelized in order to control flooding (Schoenherr 1992). Therefore, vegetation in the Los Angeles Basin has changed dramatically in response to human development. Grasslands are expanding and Coastal Sage Scrub is decreasing (Schoenherr 1992). Coastal Sage Scrub is a threatened plant community, with thirteen plant species listed as rare, endangered, or threatened (Schoenherr 1992). While this plant community has been replaced by grazing, agriculture, and development in most areas, some isolated pockets remain. The Santa Monica Mountains, Camp Pendleton Marine Corps base, and the San Joaquin Hills still contain large areas of Coastal Sage Scrub (Schoenherr 1992).

In the 1970s, the County of Los Angeles developed the concept of Significant Ecological Areas (SEAs); "SEAs are ecologically important land and water systems that support valuable habitat for plants and animals, often integral to the preservation of rare, threatened or endangered species and the conservation of biological diversity in the County" (Los Angeles County Department of Regional Planning 2009a, n.p.). The aim is to "facilitate a balance between development and resource conservation" (Los Angeles

County Department of Regional Planning 2009a, n.p.). There are no SEAs within the project area, but a number of SEAs ring the area within ten to twenty miles. The nearest are the Ballona Wetlands SEA and the El Segundo Dunes SEA, each lying about seven miles from the southwest corner of the project area (Los Angeles County Department of Regional Planning 2009b).

Today, the most notable vegetation throughout the majority of the Los Angeles Basin, which is now dominated by urban and suburban development, are exotic species and introduced California natives (those native to California, but not native to the Coastal Sage Scrub community). Examples of introduced natives include California Fan Palm (*Washingtonia filifera)* and Western Sycamore (*Platanus racemosa*). Introduced exotics are numerous and include a variety of other palm species, *Eucalyptus* species, California Pepper (*Schinus molle*), *Ficus* species, and Oleander (*Nerium oleander*).

Wildlife still exists within the greater Los Angeles region, but many of the native fauna are confined to the small pockets of native vegetation found mostly in the foothills (Seymour 2005). Exotic species are more often found in developed areas as they are better adapted to co-exist with humans. Both native and exotic wildlife that live within or near human settlements are often regarded as nuisances (Seymour 2005). Some of the nuisance species that may be found within the project area include: Common Raccoon (*Procyon lotor*), Virginia Opossum (*Didelphis virginiana*), and Squirrels (*Sciurus niger* and *Sciurus griseus*) (Seymour 2005).

Domestic animals are also present throughout the project area. Stray and feral dogs and cats, or pets that owners leave outside unsupervised, roam the streets and alleys. As alleys run behind residential backyards, it is not uncommon to encounter dogs in fenced yards. Chickens, roosters, and rabbits have also been observed in backyards and alleys.

REMEDIATION EFFORTS AND INITIATIVES

The project area is currently characterized by dense residential developments with commercial corridors and areas of industrial use. Most of the vegetation exists as street trees, yard plantings, and primarily turf and trees in parks. Most of the vegetation is not native. There have been some efforts to bring native vegetation back into the project area at some parks, such as the Augustus Hawkins Nature Park and the new South Los Angeles Wetland Park in the South Park neighborhood (Cameron 2012, Jenkins/ Gales & Martinez, Inc. 2006) (Figure 3.23).

While restoring native vegetation can provide habitat for some insect and bird species (Lowry 2007), a study mapping target species habitat in the Los Angeles area deemed urban developed areas (commercial, industrial, high density residential) as unsuitable habitat for many target species (Rubin, Rustigian,

NATIVE VEGETATION

Latin Name	Common Name
Artemisia californica	California Sagebrush
Encelia californica	California Encelia
Salvia mellifera	Black Sage
Salvia leucophylla	Purple Sage
Salvia clevelandii	Fragrant Sage
Salvia apiana	White Sage
Mimulus aurantiacus	Sticky Monkeyflower
Eriogonum fasciculatum	California Buckwheat
Heteromeles arbutifolia	Toyon or Christmas Berry
Malosma laurina	Laurel Sumac
Rhus integrifolia	Lemonadeberry
Rhus ovata	Sugar Bush
Toxicodendron diversilobum	Poison Oak
Baccharis pilularis	Coyote Brush
Hesperoyucca whipplei	Chaparral Yucca

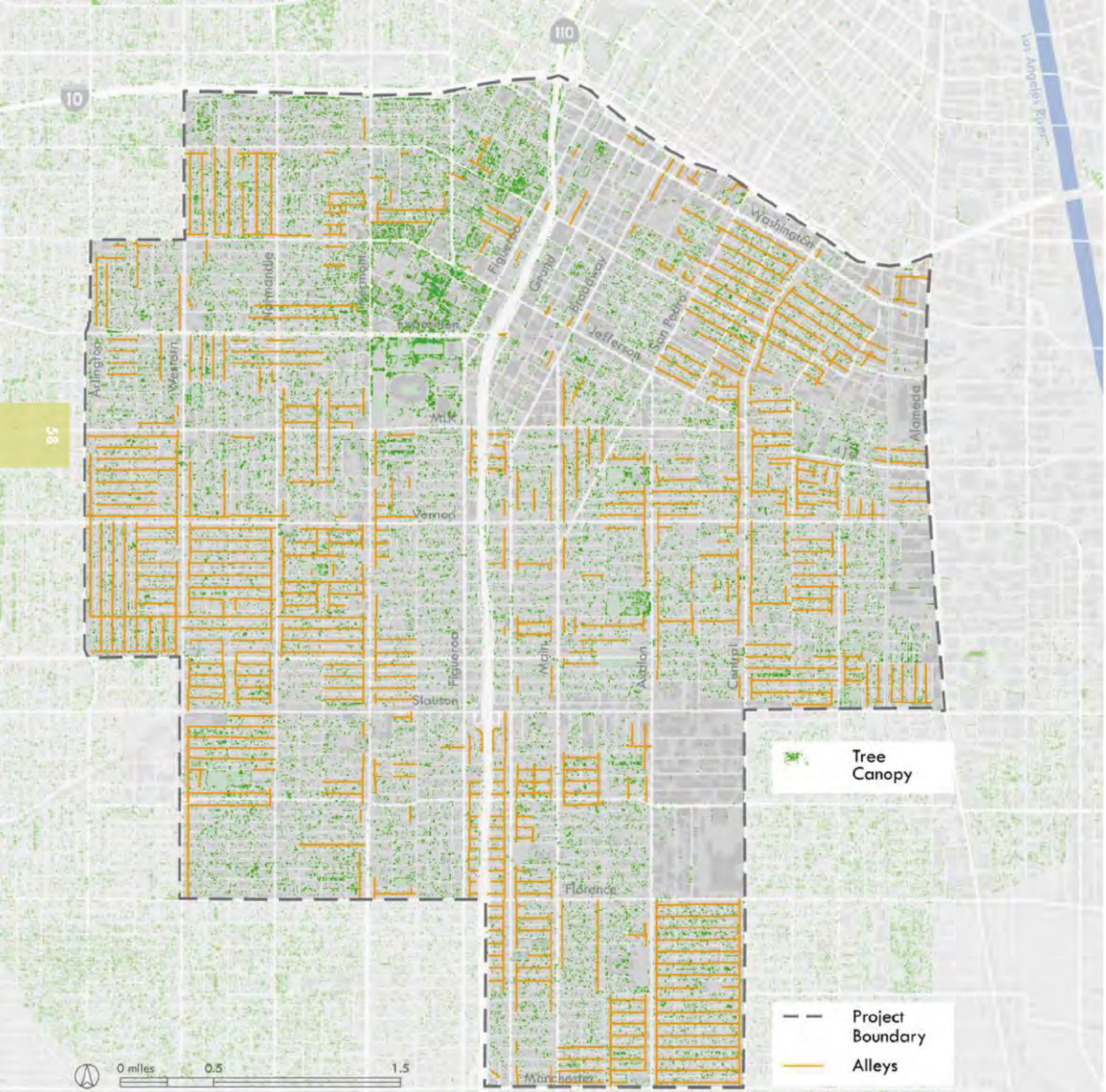
TABLE 3.20
COASTAL SAGE SCRUB VEGETATION



POTENTIAL TARGET SPECIES

Latin Name	Common Name
Lanius ludovicianus	Loggerhead Shrike
Epitesicus fuscus	Big Brown Bat
Apodemia virgulti	Behr's Metalmark

TABLE 3.21
POTENTIAL TARGET SPECIES FOR HABITAT CREATION



and White 2006). However, vacant lots and green space may provide habitat for some particular species, especially birds (Rubin et al. 2006). Refer to Table 3.21 for target species that could potentially thrive in urban green spaces; specific conditions and the species' food source and range may preclude them from the urban environment, especially within the densely developed environment of the AMP project area.

Prior to development, the Coastal Sage Scrub of the Los Angeles Basin typically had a low profile, consisting of mostly shrubs with few large trees. Human preference today, however, values large canopy trees for the benefits they provide, including shade and cooling, air quality improvement, rainfall capture, and visual character (McPherson et al. 2011). In September 2006, Mayor Antonio Villaraigosa initiated the Million Trees Los Angeles Initiative to plant one million trees in the city over the following years (McPherson et al. 2007). At the beginning of the initiative, Los Angeles' tree canopy cover was 21%, similar to Baltimore with 20% and New York City with 23% (McPherson et al. 2007). Tree canopy is not evenly distributed, however. Tree canopy cover varies between a low of 7% to 9% in Council Districts 9 and 15, and a high of 37% in Council District 5 (McPherson et al. 2007). Coverage is related to land use since areas of low density residential use have the highest percentage of tree canopy coverage

FIGURE 3.22
TREE CANOPY IN THE AMP PROJECT AREA

(31%), and industrial and commercial areas have the lowest (3-6%) (McPherson et al. 2007). Figure 3.22 demonstrates the scarcity of tree canopy coverage for the AMP project area, which includes part of Council District 9.

A study conducted at the onset of the Million Trees Los Angeles Initiative determined that Los Angeles had the potential to add 2.5 million more trees, or an increase in tree canopy cover of 12.4% (McPherson et al. 2007). The study suggests a target of planting 50% of the potential trees, resulting in 1.3 million more trees (McPherson et al. 2007). The authors used models to calculate the expected benefits of the additional trees and found "81% of total benefits are aesthetic/other, 8% are stormwater runoff reduction, 6% energy savings, 4% air quality improvement, and less than 1% atmospheric carbon reduction" (McPherson et al. 2007, p. 46).

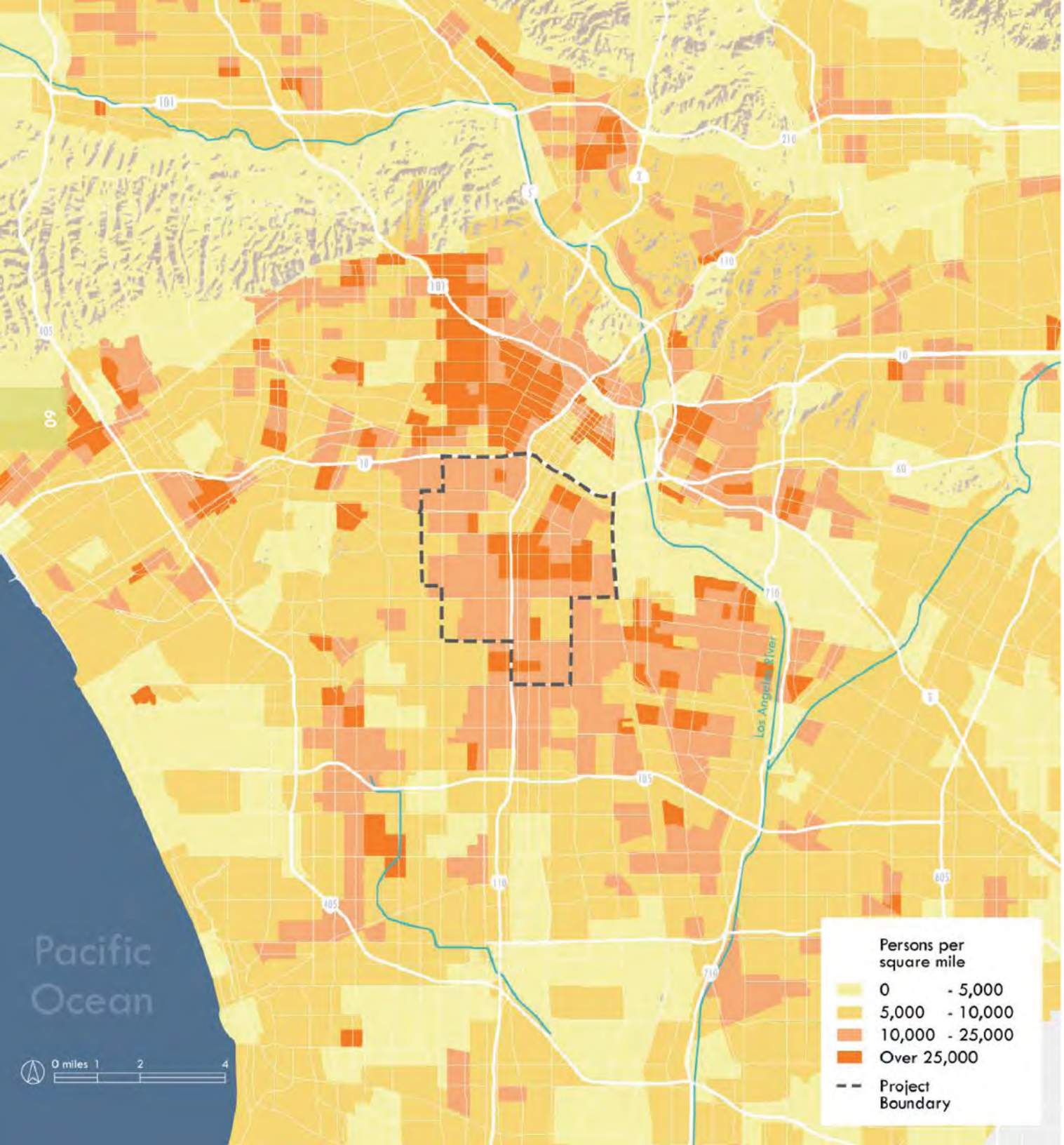
VEGETATION AND WILDLIFE DISCUSSION

Based on the inventory of existing vegetation and wildlife, the AMP recommends utilizing green alley network design to address issues associated with nuisance species of vegetation and wildlife, as well as the shared responsibility of alley maintenance between public agencies and private property owners. Illegal dumping in the alleys exacerbates problems with nuisance wildlife, providing them with food and shelter. Aggressive, invasive plant species are often present in unmaintained alleys. While some alleys themselves may not be able to accommodate significant native plant or wildlife habitat, they may serve as corridors connecting habitat patches within neighboring parks, vacant lots, and yards.

The AMP supports the Million Trees Los Angeles Initiative by recommending additional street trees throughout green alley networks, which will provide benefits for air and water quality, urban heat island, stormwater runoff reduction, and aesthetics (McPherson et al. 2011, City of Los Angeles 2006). Use of productive plant species where appropriate, such as fruit trees, or community gardens, has the added benefit of attracting pollinators and providing fresh food for the community.



FIGURE 3.23
NATIVE VEGETATION AT
AUGUSTUS HAWKINS NATURE PARK



3-B. SOCIOCULTURAL INVENTORY

Green alley networks should provide social benefits as well as environmental benefits. Therefore, the sociocultural inventory informs the AMP in terms of the project area's human context. By considering and understanding relevant demographics, land use patterns, transportation, community destinations, and crime and safety, the AMP can recommend the most appropriate solutions for the communities of South Los Angeles. The sociocultural inventory also helps the project team understand the resources and approaches needed to successfully collaborate with residents during the development and implementation of the AMP. For additional sociocultural inventory topics, please refer to Appendix F, Supplemental Inventory.

DEMOGRAPHICS

Understanding the demographic intricacies of an area proactively aids in the planning and design of community projects. By comprehending the social components of the community, identifying population-specific strategies, addressing cultural relevance and age appropriateness, and identifying methods for supporting public health, planning and design recommendations in the AMP will be based in the community context. Community input provided in later stages of the AMP (Chapter 5 and Chapter 7) complements this demographic research and the community-grounded approach of the AMP.

FIGURE 3.24
POPULATION DENSITY IN THE AMP REGION

POPULATION DENSITY

The project area has a total population of just over 338,000 persons in 18 square miles (US Census 2010). As a comparison, the City of Oakland has a slightly larger population but is 63% less dense with approximately 390,700 persons in 56 square miles (US Census 2010). The population within the project area represents 8.9% of the City of Los Angeles' total population (US Census 2010). The average density of the City of Los Angeles is just over 8,000 persons per square mile, whereas the average density for the project area is more than twice as dense, with nearly 19,000 persons per square mile (US Census 2010). In comparison to the surrounding region, the project area is considered a high-density community (Figure 3.24).

Census blocks with high to very high population density are evenly distributed throughout the project area with a few low-density census blocks corresponding with the University of Southern California campus, Exposition Park, and industrial areas. The east side of the project area contains a cluster of medium- to high-density census blocks (Figure 3.25).

High-density areas demonstrate vast and diverse population needs and preferences. For the project area, community needs and preferences are further compounded as housing stock is mostly comprised of single-family homes and a few multi-story apartment buildings of no more than six stories. As the entire project area is very dense, the AMP focuses on recommending appropriate multi-benefit solutions for alley network redevelopment to reach the greatest number of users and, in turn, meet the greatest number of needs.

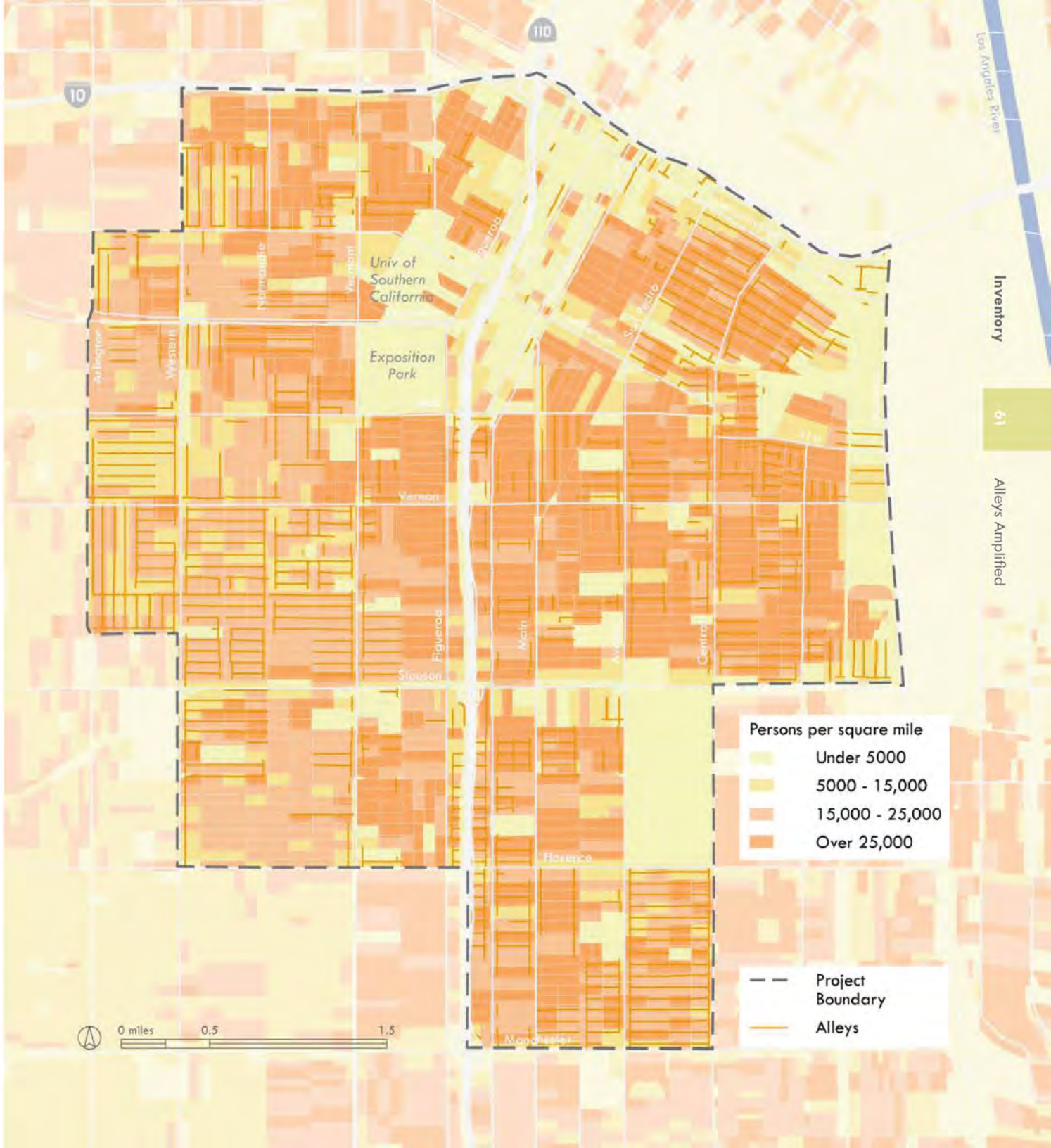


FIGURE 3.25
POPULATION DENSITY IN THE AMP PROJECT AREA

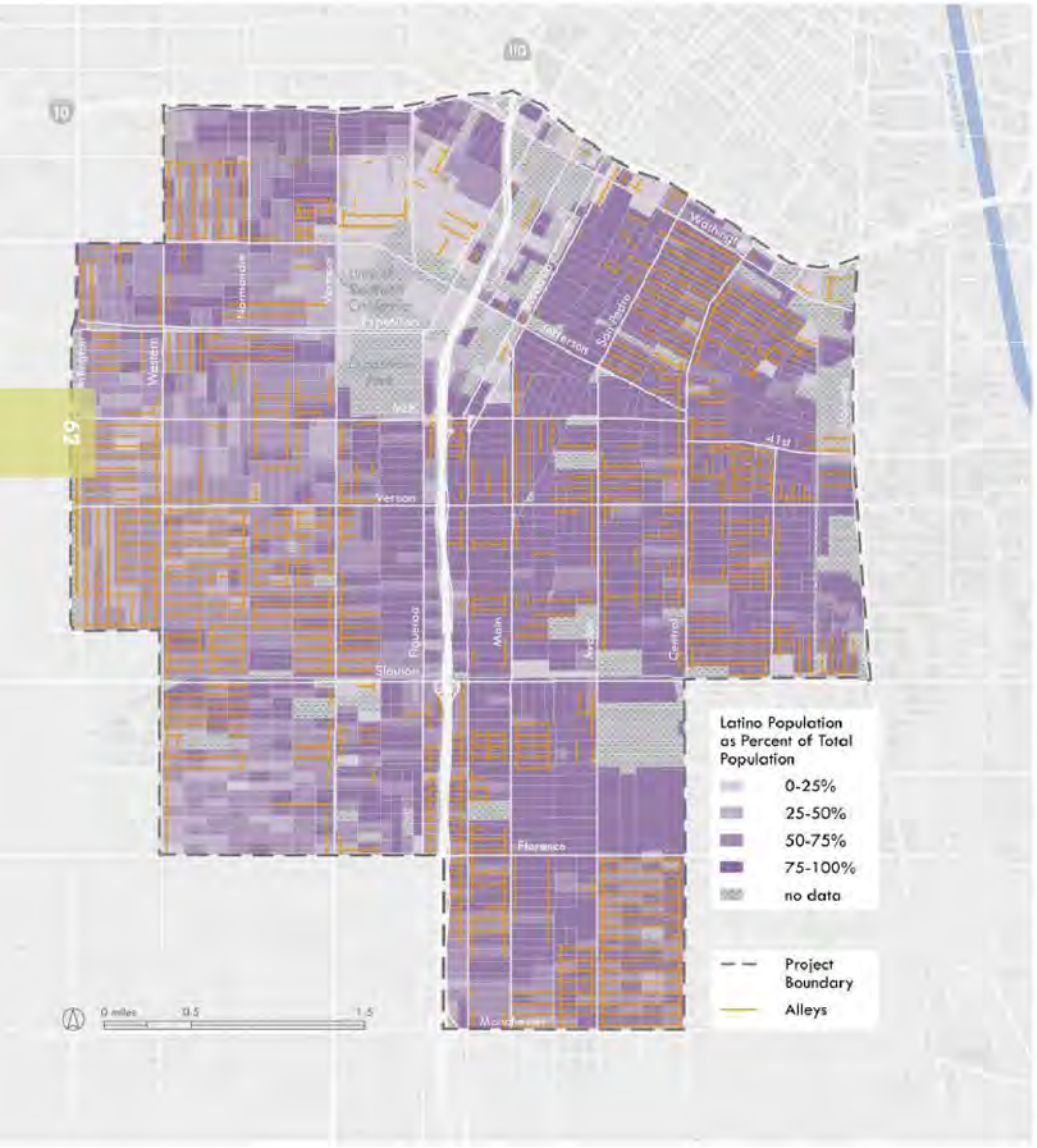


FIGURE 3.26
RACE/ETHNICITY IN THE AMP PROJECT AREA, LATINO

RACE AND ETHNICITY

The US Census Bureau (2010) reports the AMP project population is racially composed of 30.6% Caucasian, 18.8% African American, 3.0% Asian, 1.0% American Indian and Alaska Native, and 0.1% Native Hawaiian and other Pacific Islander. Residents classified in the Latino ethnic group comprise 74.5% of the project area, a percentage that is significantly higher than both the City (48.5%) and County (47.7%) (US Census 2010). While the Latino population has grown over the past 30 years to become the majority, the African American population in the area is significant. At 18.8%, it is almost twice the City's African American population percentage of 9.6%, and significantly higher than the County population of 8.7% (US Census 2010). This is evidence of the community's influential African American history.

Figure 3.27 shows higher densities of African American residents in the western portion of the project area, with lower population densities compared with the rest of the project area. Figure 3.26 reveals that densities of Latino residents are much higher east of Interstate 110.

The Asian population in the AMP region is concentrated around the University of Southern California campus (Figure 3.29) and the population that is Caucasian alone is fairly evenly distributed, with lower densities in the western portion (Figure 3.30). Both the percentages of Caucasian and Asian populations in the project area (30.6% Caucasian, 3.0% Asian) are lower than those found in both the City (49.8% Caucasian, 11.3% Asian) and County (50.3% Caucasian, 13.7% Asian).

The racial and ethnic composition of the project area is potentially linked to the quantity and quality of resources available in the community. Paul Sherer (2005) notes that "low-income neighborhoods populated by minorities and recent immigrants are especially short of park space" (Sherer 2005, p. 6). Throughout history, minority and low income populations have been relegated "to live on the wrong side of the tracks, in paved-over, industrialized areas with few public amenities. From an equity standpoint, there is a strong need to redress this imbalance" (Sherer 2005, p. 6). Recognizing the project area's history of disenfranchisement and marginalization, the AMP takes care in its selection and redevelopment of alley networks to increase equitable access to open space.

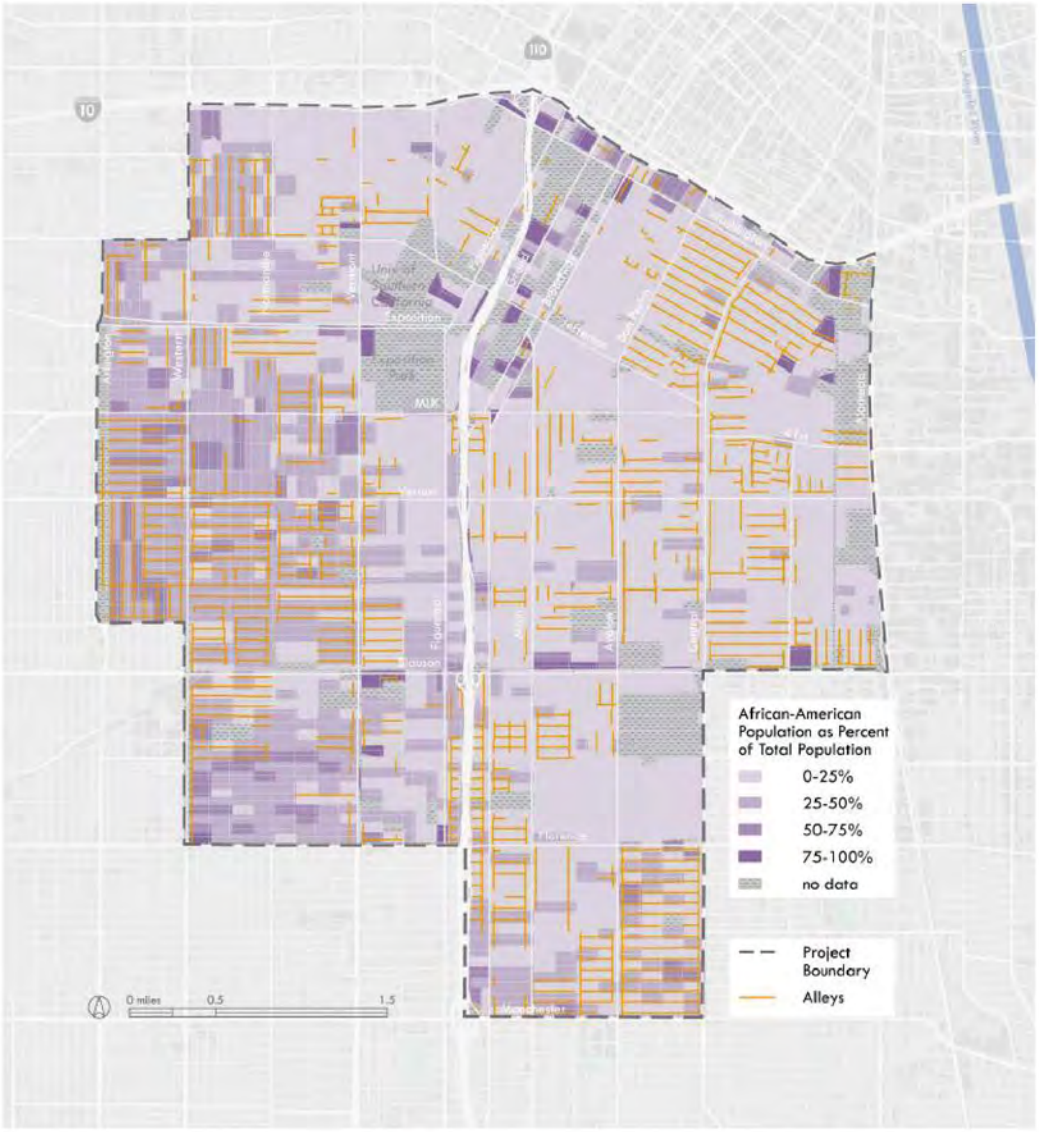


FIGURE 3.27
RACE/ETHNICITY IN THE AMP PROJECT AREA, AFRICAN AMERICAN

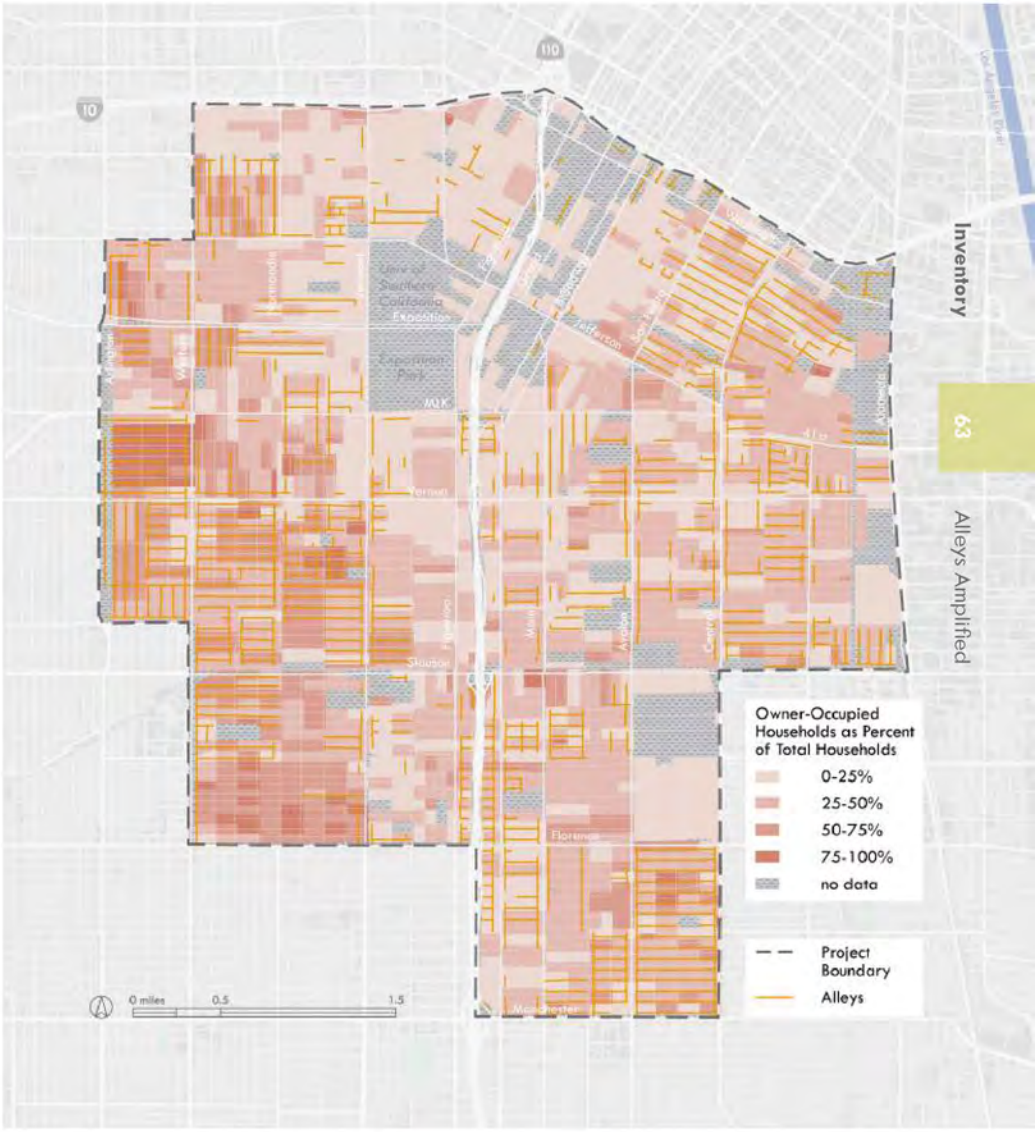


FIGURE 3.28
OWNER-OCCUPIED HOUSING IN THE AMP PROJECT AREA

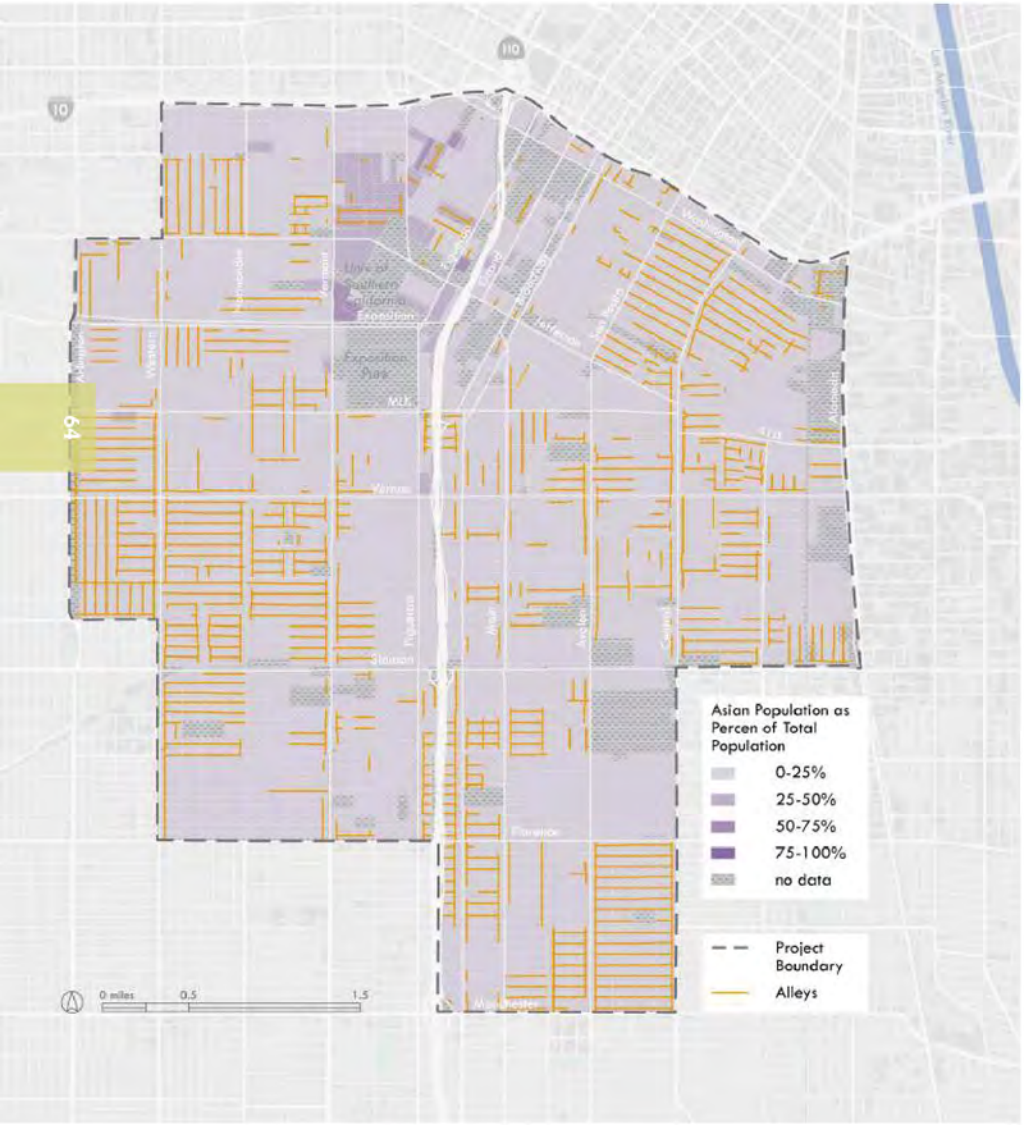


FIGURE 3.29
RACE/ETHNICITY IN THE AMP PROJECT AREA, ASIAN

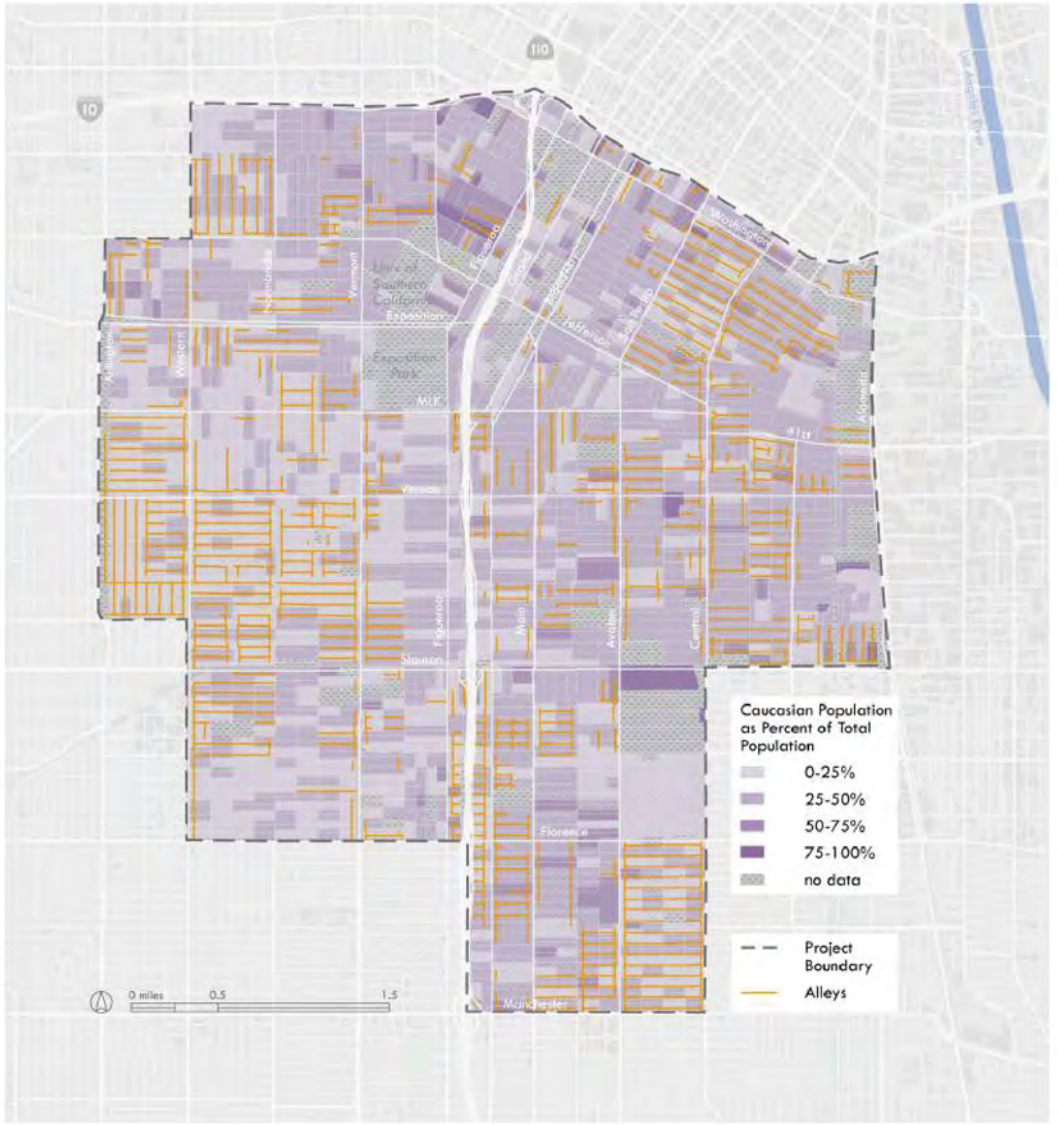


FIGURE 3.30
RACE/ETHNICITY IN THE AMP PROJECT AREA, CAUCASIAN

LANGUAGE

Language is an important consideration for projects that depend on community involvement, whether through participatory design, education, or stewardship. Research reveals that when resources are not provided in one's own language, it inhibits the person's economic mobility and access to resources (The USC Center for Economic Development 2001). Similarly, when working to improve environmental literacy and educating the public about how their daily lives are connected to and can affect watershed health, it is important to utilize the language with which the community is most comfortable.

Census data shows a high percentage of Spanish-speaking households within the project area (Appendix F Supplemental Inventory). Figure 3.31 shows linguistically-isolated households, or those homes where no English is spoken. Given the ethnic composition of the project area, Spanish is likely the language spoken in the majority of these households. In order to reach the maximum percentage of the project area population, it is important for AMP outreach and education strategies to be conducted in Spanish and English.

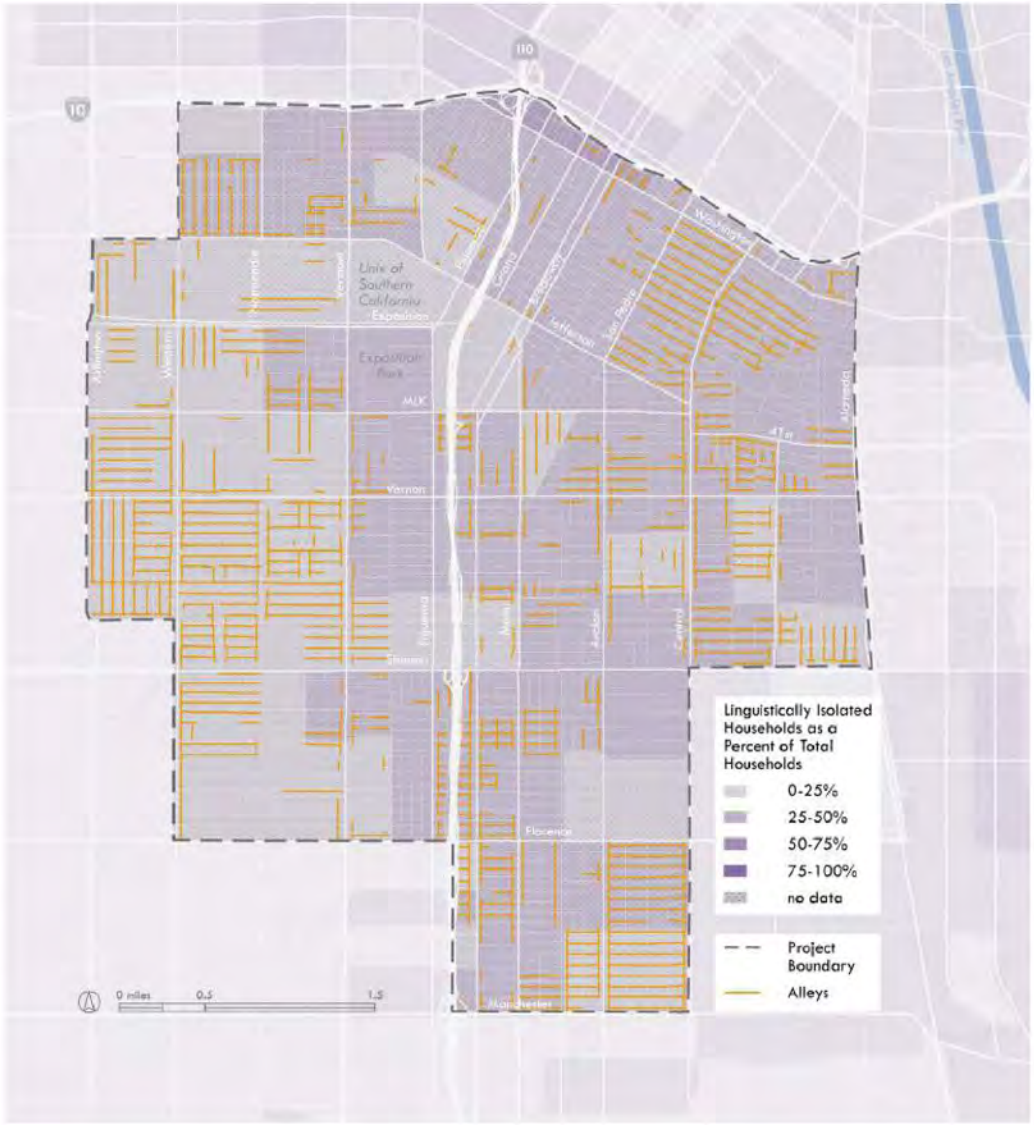


FIGURE 3.31(ABOVE)
LINGUISTICALLY ISOLATED HOUSEHOLDS IN THE AMP PROJECT AREA

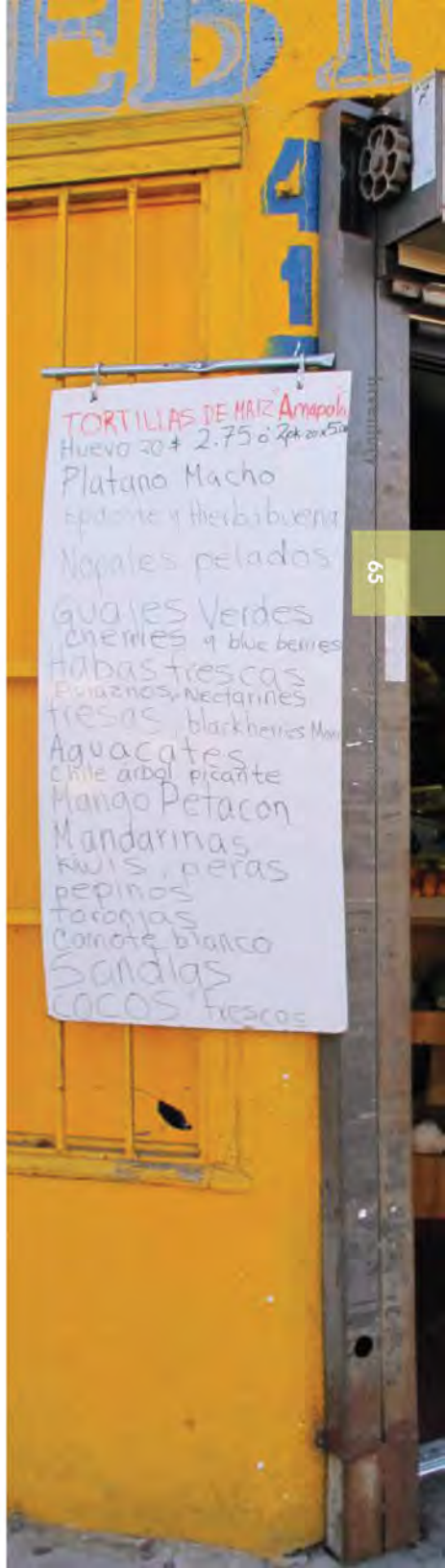


FIGURE 3.32
PRODUCE SIGN IN SPANISH ON CENTRAL AVENUE



FIGURE 3.33
FOUR-YEAR DEGREE HOLDERS IN THE AMP PROJECT AREA

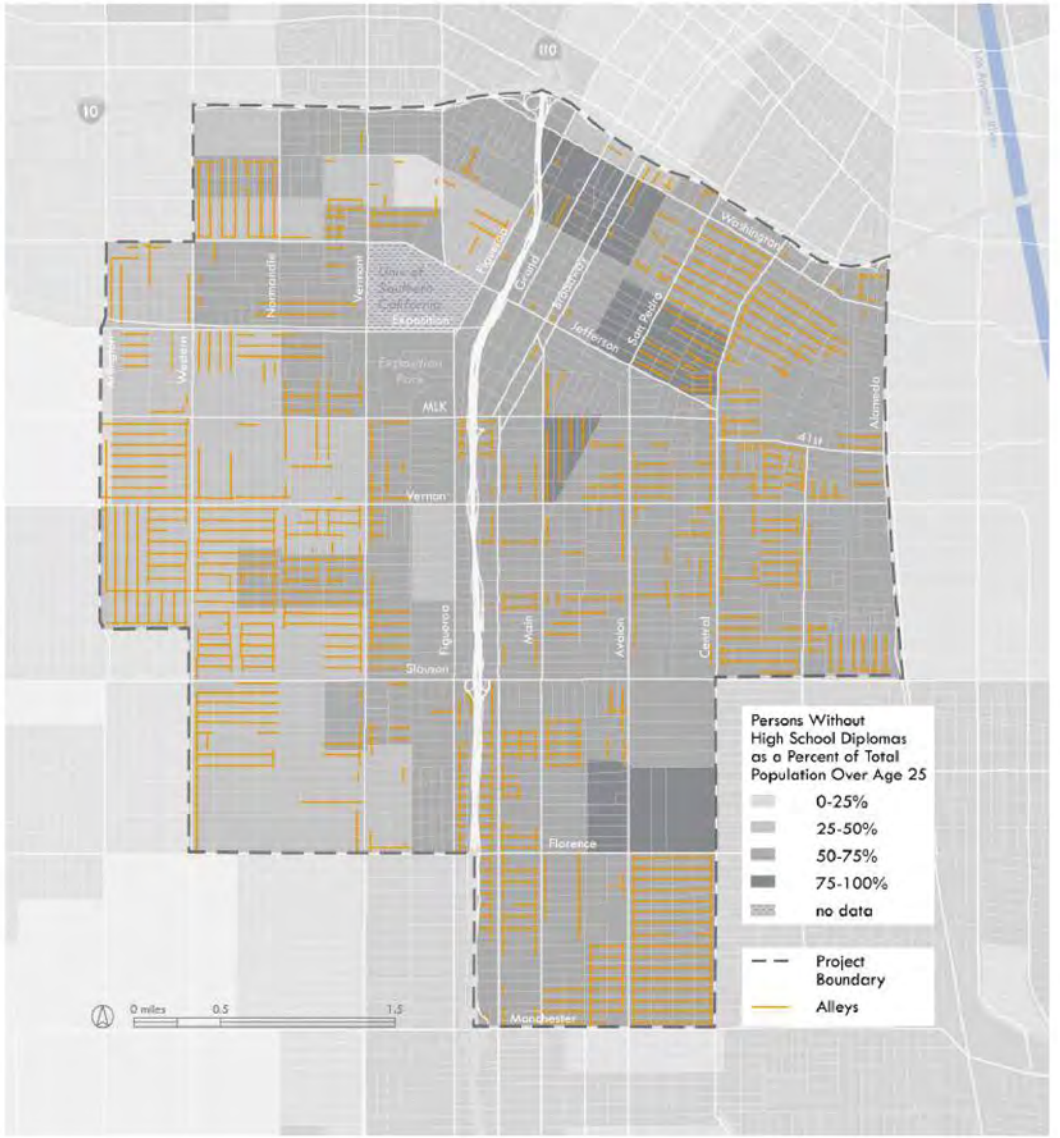


FIGURE 3.34
PERSONS WITH NO HIGH SCHOOL DIPLOMA IN THE AMP PROJECT AREA

EDUCATIONAL ATTAINMENT AND INCOME

Compared to the surrounding area of the County, only a small portion of the project area's population holds higher education degrees (Figure 3.33). The majority of these residents live near the University of Southern California. Moreover, 55% of persons over the age of 25 living in the project area do not have a high school diploma. This disparity is especially visible east of Interstate 110 (Figure 3.34).

Challenges associated with low levels of educational attainment are similar to the challenges linked with linguistic isolation. Low educational attainment in the project area threatens social progress and economic growth according to a 1992 survey studying literacy administered by the U.S. Department of Education (Kodrzycki 2002). This study found income and employment to be strongly and positively correlated with literacy, where average proficiency was found to increase with years of education (Kodrzycki 2002). The project area's median household income is just $28,844 compared to $48,746 for the City and $54,878 for the County, and is one of the lowest figures in the region (US Census 2010). Additionally, Figure 3.36 shows that a significant number of people in the project area live below the poverty line (US Census 2010). The findings of the U.S. Department of Education's survey and figures from the 2010 Census direct the AMP to include strategies for increased education opportunities in outreach and implementation efforts.



FIGURE 3.35
SCHOOL SIGN IN THE AMP PROJECT AREA

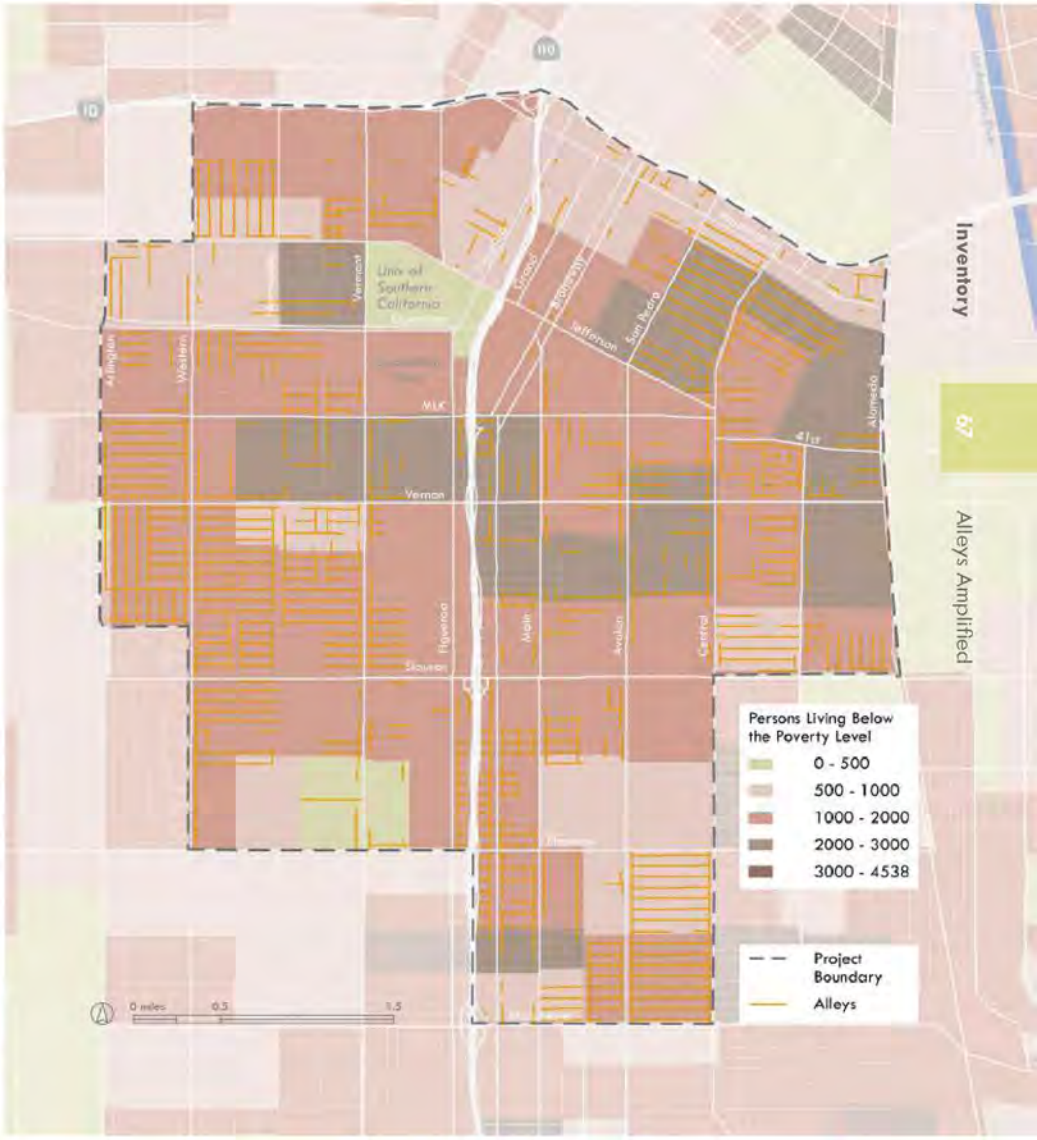


FIGURE 3.36
HOUSEHOLDS BELOW THE POVERTY LEVEL IN THE AMP PROJECT AREA



HEALTH INDICATORS

A 2008 study conducted by Community Health Councils, Inc. examined 50 socioeconomic and environmental factors that influence health behavior. Outcomes found that "more than any other region of the county, South Los Angeles is disproportionately disadvantaged and harmed by inequities in healthcare and physical resource environments" (Park, Watson, and Galloway-Gilliam 2008, p. 3). Important health issues of the area relate to coronary heart disease, diabetes, lung cancer, stroke, and obesity (Park et al. 2008).

In Los Angeles County, adult obesity increased from 13.6% in 1997 to 22.2% in 2007 and obesity rates among children increased from 18.9% in 1999 to 23.0% in 2008 (Los Angeles County Department of Public Health 2011). Inequities in obesity rates are observed throughout the County, in which "both adults and school-aged children from socioeconomically disadvantaged communities [have] significantly higher obesity rates than counterparts living in more affluent communities" (Los Angeles County Department of Public Health 2011, p. 2). This is evidenced by percentages of obesity prevalence in Council Districts 8 and 9, which include the project area, that are higher than the County average. Council District 8 had 35.1% and Council District 9 had 36.7% adult obesity prevalence in 2007, and child obesity prevalence was 30.1% and 29.5% respectively in 2008.

FIGURE 3.37
UNPERMITTED SNACK VENDOR AT ROSS SNYDER RECREATION CENTER

A study in Baltimore examined the relationship between physical activity and the urban environment. Residents in walkable neighborhoods reported walking to nearby destinations more than residents in less walkable neighborhoods (King et al. 2011). This finding remained true regardless of neighborhood income levels and suggests that improved pedestrian infrastructure can benefit residents across the income spectrum (King et al. 2011). Increasing physical activity can help to alleviate symptoms and risks associated with heart disease, obesity, and diabetes.

The AMP includes recommendations that have the potential to reverse the trend of poor health within the project area through upgrades to the built environment. Improving connectivity between residents and health facilities, increasing safety infrastructure for pedestrians and bicyclists, providing usable open spaces, improving access to fresh foods, and including recreational opportunities in green alley retrofits can all contribute to improved health in the community.

AGE DISTRIBUTION

Sixty-four percent of the project area's population is between the ages of 18 and 64 (Figure 3.40), 30.5% is under 18 years (Figure 3.39), and 6% is above 65 (Figure 3.41) (US Census 2010). The relatively high percentage of youth in the project area compared to that of the City of Los Angeles signifies the AMP's

unique opportunity to benefit a large portion of the project area population by redeveloping alleys to be attractive to, and meet the needs of, those under the age of 18. For example, the AMP provides strong linkages between parks and schools to encourage walking, bicycling, and recreation among the project area's youth.



FIGURE 3.38
YOUTH IN THE AMP PROJECT AREA, 55TH STREET AND LONG BEACH AVENUE

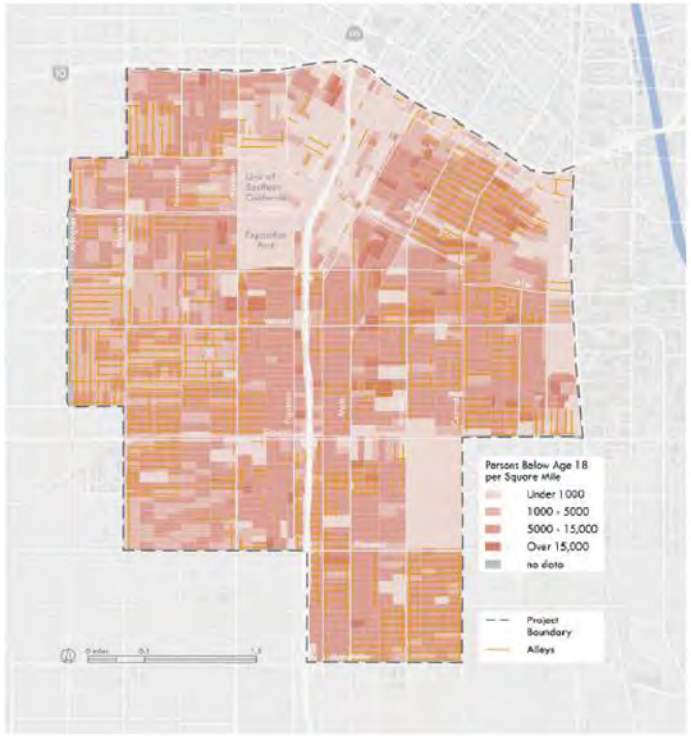


FIGURE 3.39
PERSONS BELOW AGE 18
IN THE AMP PROJECT AREA

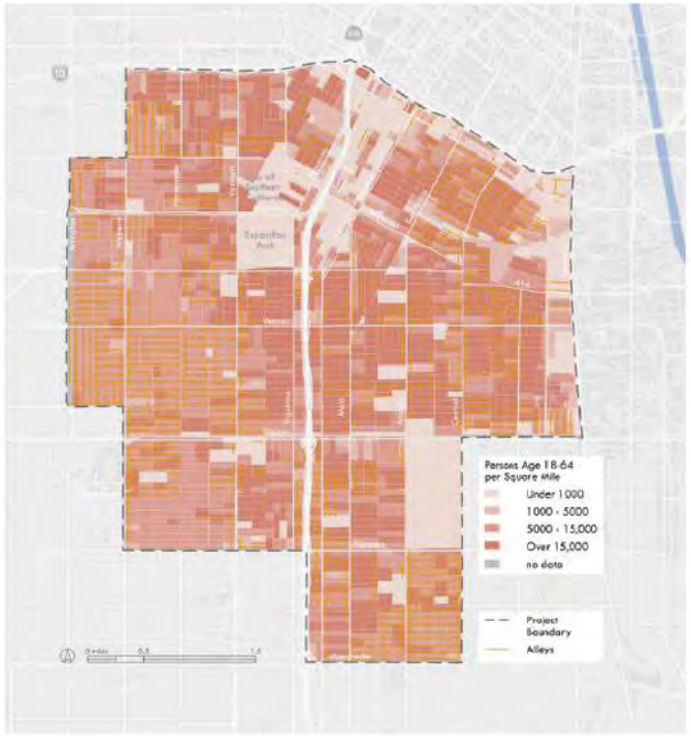


FIGURE 3.40
PERSONS AGE 18-64
IN THE AMP PROJECT AREA

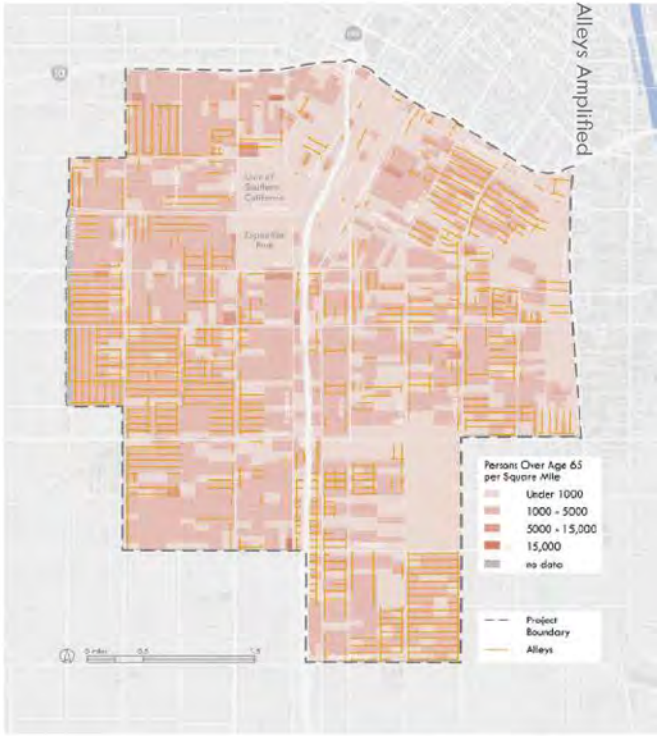
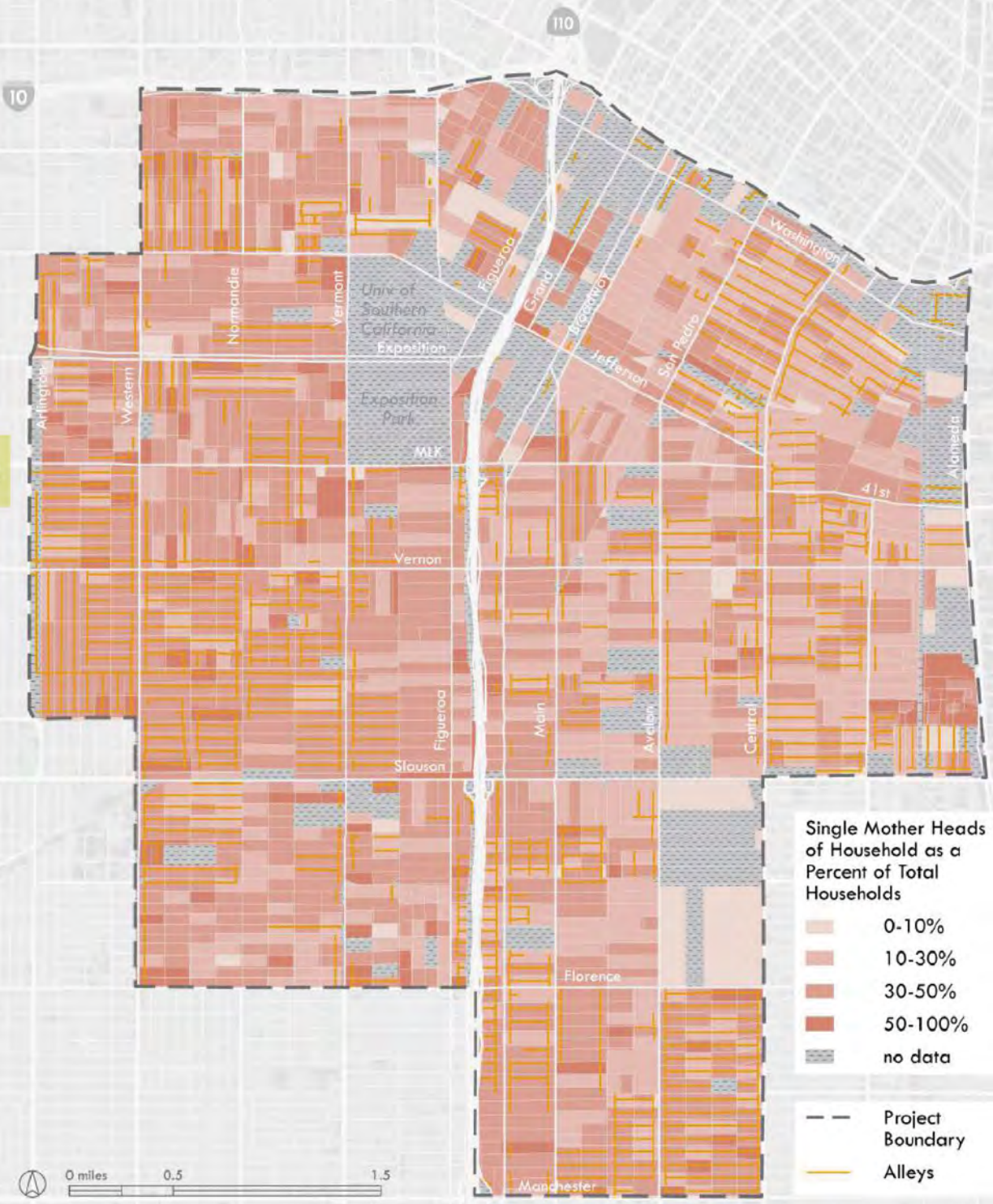


FIGURE 3.41
PERSONS OVER AGE 65
IN THE AMP PROJECT AREA



GENDER DISTRIBUTION

Consistent with demographics for both the City and the County, the project area is evenly divided between the male population, 49.9%, and the female population, 50.1%. There is, however, a slight imbalance in the distribution, with slightly higher densities of women to the west of Interstate 110, and higher densities of men to the east.

Further investigation reveals that higher densities of women to the west of Interstate 110 coincide with higher densities of single mothers in that area (Figure 3.42). This correlation is another opportunity for the AMP to thoroughly understand the intricacy of the project area so that recommendations made are truly site and community specific.

FIGURE 3.42
SINGLE MOTHER HEADS OF HOUSEHOLD IN THE AMP PROJECT AREA

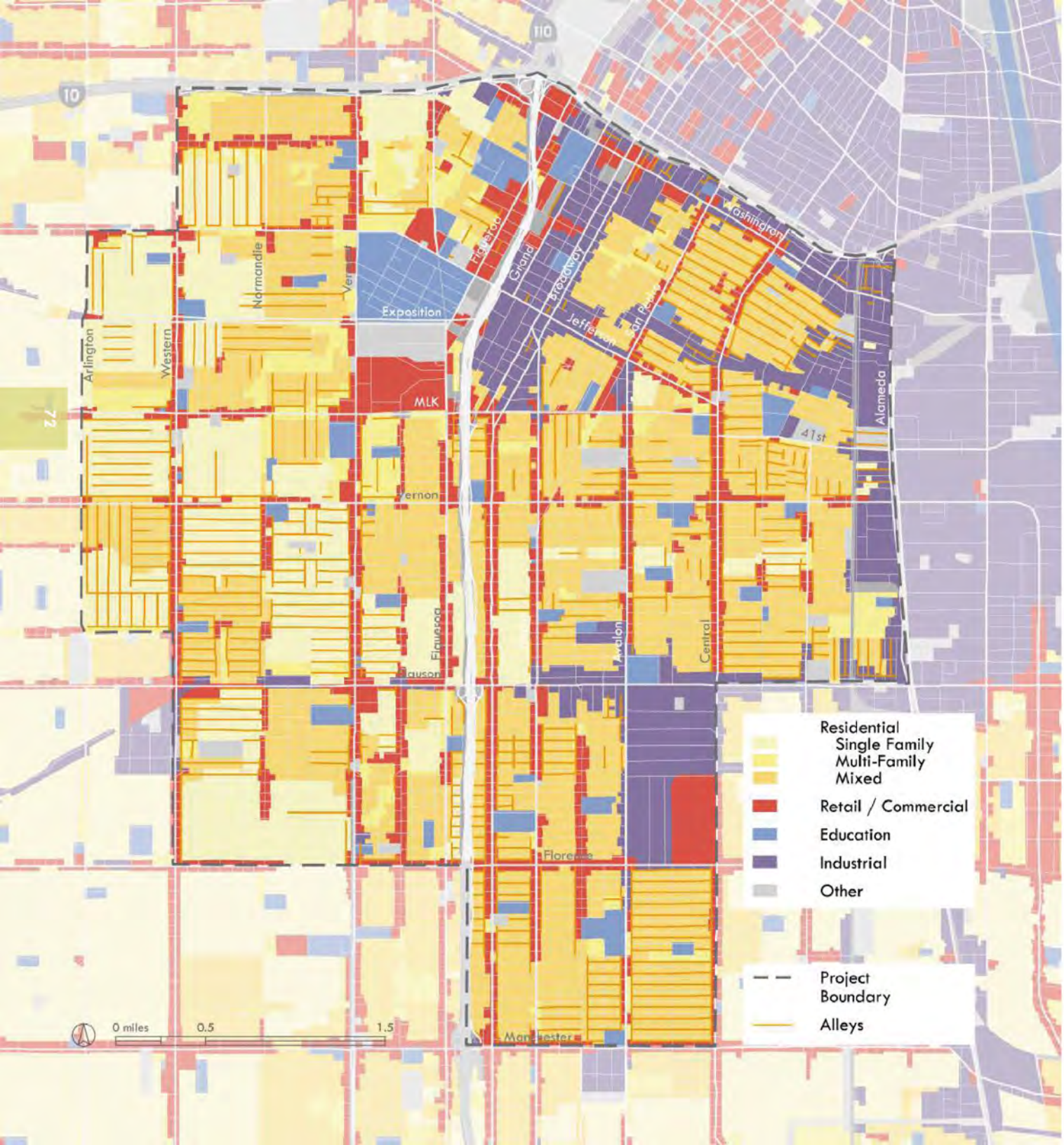
DEMOGRAPHICS DISCUSSION

The project area is highly dense, with large Latino and African American populations. While alley networks appear to be small spaces, the streets and alleys of South Los Angeles weave throughout highly populated neighborhoods, and therefore can positively impact a large proportion of the population and their quality of life. The AMP development and implementation must be sensitive to the needs of this population. Materials need to be provided in English and Spanish, and should appeal to youth as well as adults. Limited economic resources suggest that individuals have limited ability to pay for infrastructure improvements, but health indicators point to the communities' acute need for a physical environment that supports healthier lifestyles. This sociocultural context strongly supports the communities' need for the AMP as a solution for improving quality of life, now and for future generations.

TABLE 3.43
DEMOGRAPHIC SUMMARY FOR
THE AMP PROJECT AREA

DEMOGRAPHIC SUMMARY		Project Area	City of Los Angeles	Los Angeles County	
Area (Square Miles)		18	502.693	4752.32	
Population					
	Size	338,174	3,792,621	9,818,605	*
	Male	49.90%	49.80%	49.30%	*
	Female	50.10%	50.20%	50.70%	*
Race/Ethnicity					
	African American	18.80%	9.60%	8.70%	*
	Caucasian	30.60%	49.80%	50.30%	*
	American Indian and Alaska Native	1.00%	0.70%	0.70%	*
	Asian/Pacific Islander	3.00%	11.30%	13.70%	*
	Native Hawaiian and other Pacific Islander	0.10%	0.10%	0.30%	*
	Latino	74.50%	48.50%	47.70%	*
	Bilingual Households	38.90%	60.20%	56.80%	**
Age					
	<18 yrs	30.50%	23.10%	24.50%	*
	65+	6.00%	10.50%	10.90%	*
Households					
	Total	108,212	1,318,168	3,241,204	**
	with individuals <18	51.20%	33.90%	37.60%	**
	with individuals 65+	17.80%	22.60%	24.40%	**
Educational Attainment					
	25+, No HS Diploma	55.30%	26.20%	24.50%	**
	25+, College Degree	11.10%	30.40%	29.10%	**
Economics					
	Median HH Income	$28,844	$48,746	$54,878	**
	Median Gross Rent	ND	$1,104.00	$1,141.00	**
Employment Status					
	Employed	ND	60.80%	60.10%	**
	Unemployed	ND	5.40%	5.00%	**
	Armed Forces	ND	0.10%	0.10%	**
	Not in labor force	ND	33.70%	34.80%	**
Commuting to Work, 16+					
	Total	158,075	1,749,799	4,392,995	**
	Car, drove alone	56.30%	67.40%	72.20%	**
	Car, carpooled	13.00%	11.10%	11.60%	**
	Public Transportation	19.40%	10.90%	7.00%	**
	Walked	4.10%	3.50%	2.80%	**
	Other Means	2.40%	2.20%	2.10%	**
	Worked at home	2.60%	4.90%	4.30%	**
	Average Aggregate travel time/ Workers 16+ in HH not work from home	39.72	28.07	27.96	**
Vehicles Available Occupied Units					
	Total Workers 16+ in households	154,487.00	1,735,070.00	4,366,117.00	**
	No vehicles available	12.20%	7.40%	4.80%	**
	1 vehicle available	30.80%	28.40%	23.10%	**
	2 vehicles available	29.40%	38.00%	38.60%	**
	3 ore more vehicles available	27.50%	26.30%	33.40%	**
Land Ownership					
	Owner-Occupied Housing	28.40%	38.20%	47.70%	*
	Renter-Occupied Housing	71.60%	61.80%	52.30%	*

ND No data
* 2010 Census: Census blocks within project area
** 2005-2009 American Community Survey 5-year estimates: Census tracts within project area



LAND USE PATTERNS

The project area has a mix of land uses. The primary land use is residential, interspersed with a grid of commercial corridors. Significant industrial areas are found to the east (Alameda), with the University of Southern California campus and Exposition Park standing out as notable landmarks (Figure 3.44).

LAND USE PATTERNS DISCUSSION

As the AMP project area is mostly built out, there are limited opportunities for creating new public open spaces. Existing infrastructure, including alleys, streets, sidewalks, public right-of-ways, and vacant lots have the potential to function as open spaces that provide multiple, much-needed benefits to South Los Angeles. Open spaces have been proven to bring:

- Economic benefits, such as increased property values, economic revitalization, and greater rates of tourism;
- Environmental benefits, such as pollution abatement, cooling of microclimates, and controlling stormwater runoff; and
- Community benefits, such as reducing crime, providing recreational opportunities, and creating stable neighborhoods with strong communities (Sherer 2005).

One of the primary goals of the AMP is to identify existing spaces that possess the unique potential to support urban green space expansion and to transform them into assets that benefit the community.

FIGURE 3.44
LAND USE IN THE AMP PROJECT AREA



FIGURE 3.45
COMMERCIAL CORRIDOR,
MAIN STREET



FIGURE 3.46
VACANT LOT NEXT TO
RESIDENTIAL BUILDINGS, CENTRAL
AVENUE AND E 21ST STREET





HOMELESSNESS

South Los Angeles has a very large homeless population. Council District 9 has the greatest number of homeless persons of all City Council Districts, with 5,810 homeless counted in 2011. Council District 8 has the second greatest homeless population with 2,362. Combined, these two council districts contain nearly 35% of the estimated 23,539 total homeless people in the City of Los Angeles (Los Angeles Homeless Services Authority 2011). Small encampments have been observed in a number of alleys throughout the project area. It is clear that these alleys, when not utilized by the surrounding residents, have the potential to serve as places for the homeless to live (Figures 3.47 and 3.48).

HOMELESSNESS DISCUSSION

The AMP recognizes that amplifying alleys – making them spaces that serve multiple functions and are highly utilized by the community – will likely have the effect of displacing the homeless who live in alleys. Homelessness is a complex issue and the AMP does not intend to displace or disadvantage any of the residents of South Los Angeles. Therefore this project does not propose a solution or strategy for alleys with homeless populations. Instead it recommends that while determining particular alleys to amplify and the design responses to implement, local organizations with expertise in the issue of homelessness, such as the Los Angeles Homeless Services Authority, should be consulted.

FIGURES 3.47 AND 3.48
HOMELESS ENCAMPMENTS IN ALLEYS

TRANSPORTATION

REGIONAL CONNECTIONS

The project area is well connected to the larger region by a number of freeways. The area is bisected by Interstate 110 (Harbor Freeway), which runs north-south, and is bounded to its north by the east-west oriented Interstate 10 (Santa Monica Freeway). Within just a few miles of the project boundaries lie six more freeways:

- Interstate 5 (Santa Ana Freeway),
- State Route 60 (Pomona Freeway),
- US Highway 101 (Hollywood Freeway),
- Interstate 105 (Century Freeway),
- Interstate 405 (San Diego Freeway), and
- Interstate 710 (Long Beach Freeway).

Los Angeles Union Station, located just two miles from the northeast corner of the project area, offers commuter and long distance rail connections, and links to the project area via the Metro light rail system. Los Angeles International Airport, just over five miles from the project boundary, offers connections to national and international destinations, and can be accessed from the site by a combination of light rail, bus, and shuttle service (Figure 3.49).

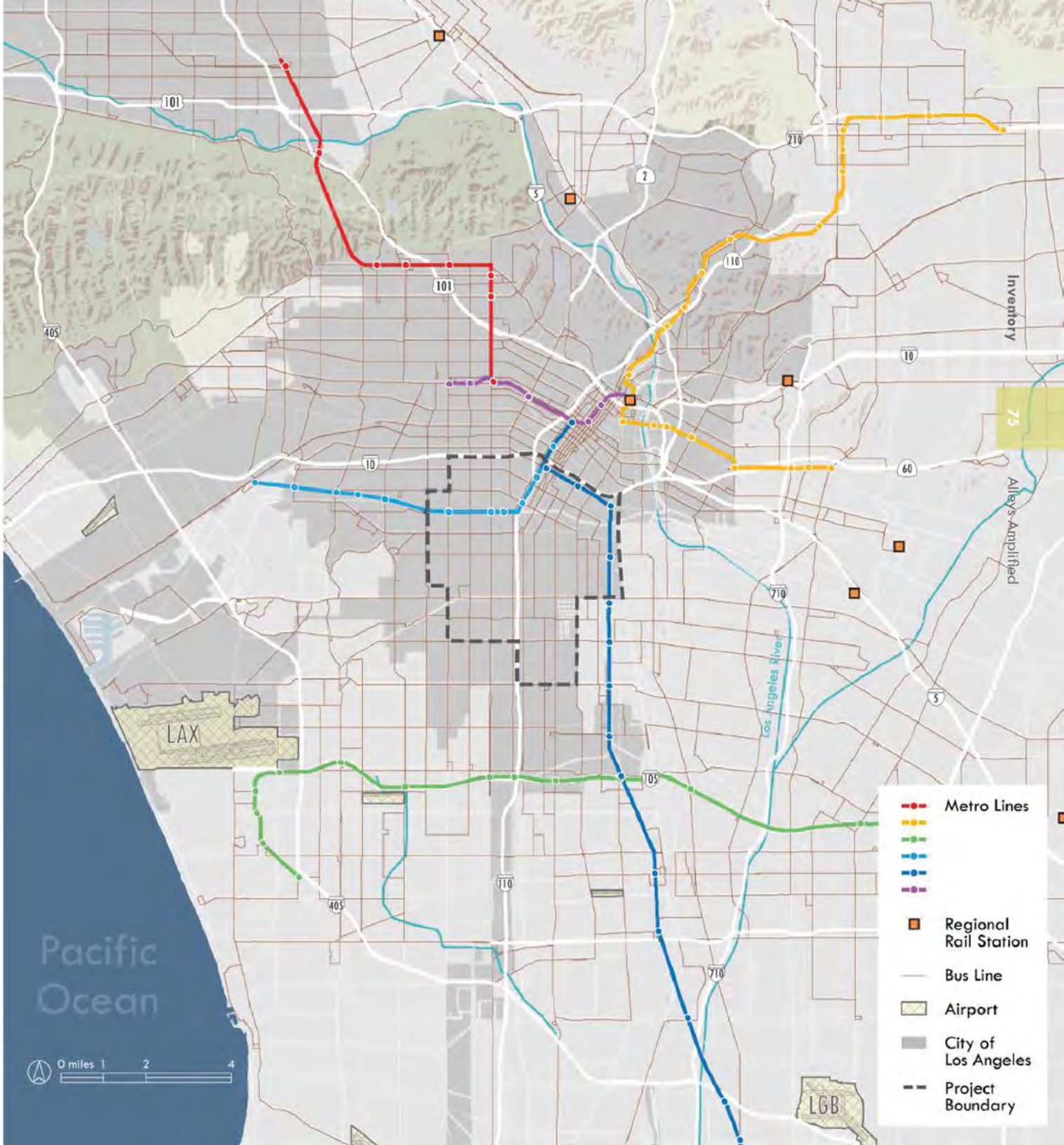
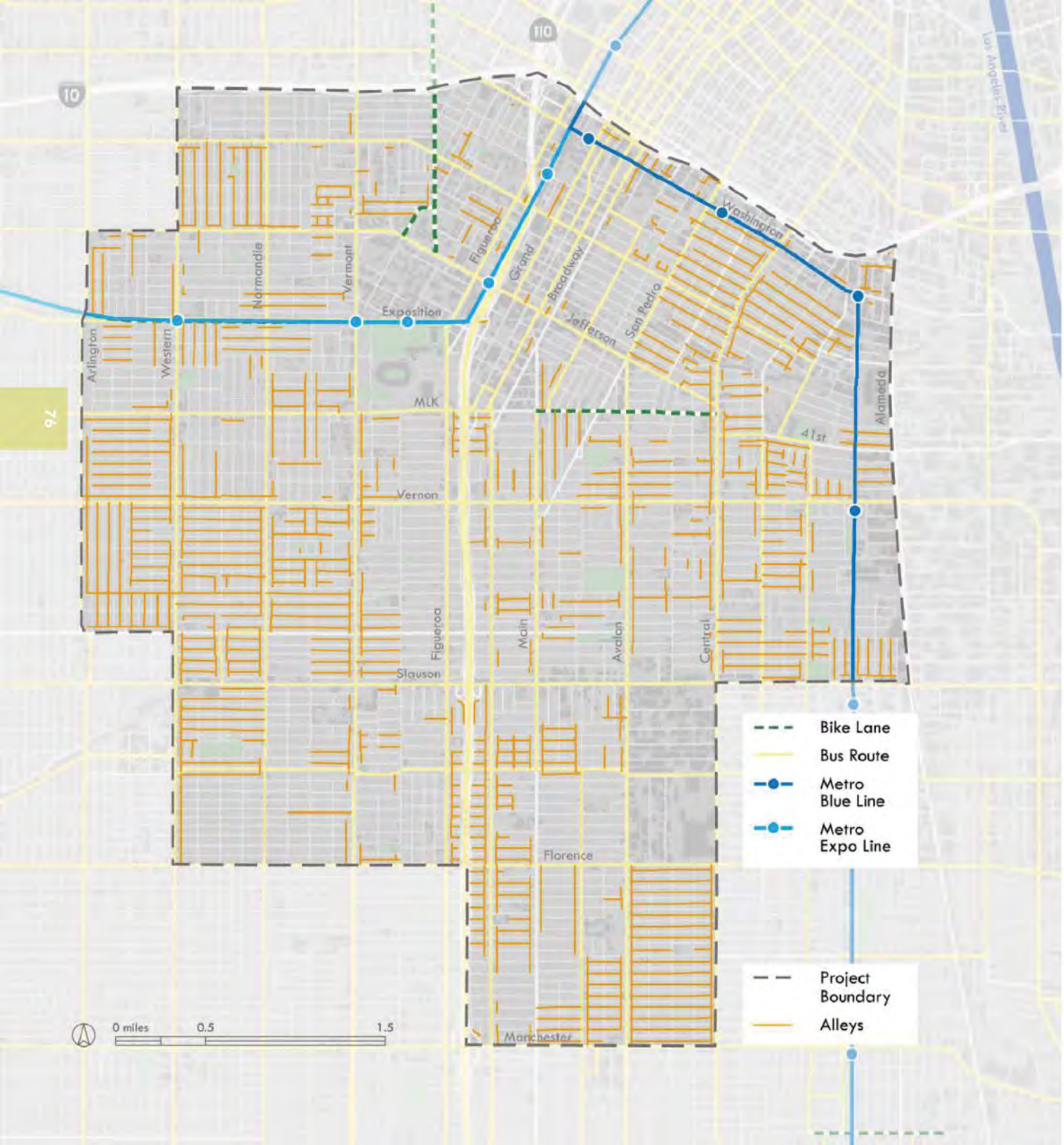


FIGURE 3.49
TRANSPORTATION CONNECTIONS IN THE AMP REGION



LOCAL CONNECTIONS

Nearly every major street is serviced by a bus line, and the Metro Blue Line light rail, with service between downtown Los Angeles and Long Beach, passes through the eastern half of the project area. The new Metro Expo Line light rail (opened April 2012) currently connects downtown Los Angeles and Culver City, running along Exposition Boulevard in the northern half of the project area (Figures 3.49 and 3.50), with plans to connect to Santa Monica in 2015.

Figure 3.50 shows the existing bike lanes in the project area. Bicycle travel areas are designated as Class I, II, or III. Following are descriptions of each class:

- Class I Bicycle Paths are car-free areas completely separate from traffic,
- Class II Bicycle Lanes are set aside in city streets exclusively for bikes and are identified by a striped lane separating bicycles from vehicles, and
- Class III Bicycle Routes are in-road bikeways where bicycles and vehicles share the road (City of Los Angeles Department of City Planning 2010b).

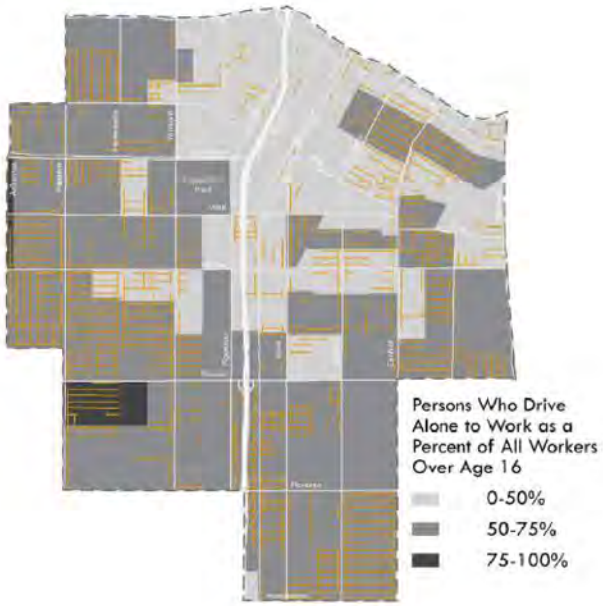
While the City has extensive plans for a bicycle network, only three Class II bike lanes exist in the project area, all serving the area adjacent to the University of Southern California. No Class I bike paths lie within the project area. Several Class III bike routes do exist, but as they do not provide a separate designated space for cyclists they have not been included in this inventory.

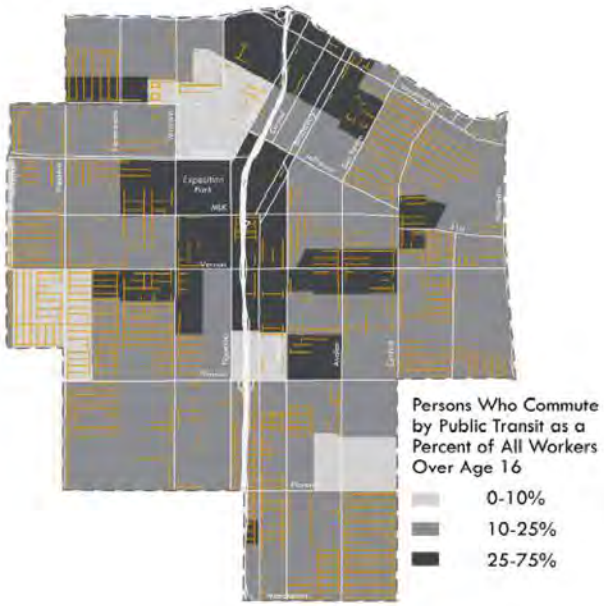
FIGURE 3.50
PUBLIC TRANSPORTATION AND BIKE LANES IN THE AMP PROJECT AREA

The 2010 Bicycle Plan, a component of the City of Los Angeles Transportation Element, introduced three new bikeway networks: the Backbone Bikeway Network, the Neighborhood Bikeway Network, and the Green Bikeway Network (City of Los Angeles Department of City Planning 2010b). Of the three networks introduced, the Backbone and Neighborhood Bikeway Networks were identified for selected street segments within the project area. Bikeways within the Backbone Network are comprised primarily of bicycle lanes on streets with moderate to heavy traffic and are intended for use by experienced riders (City of Los Angeles Department of City Planning 2010b). Bikeways within the Neighborhood Network are comprised primarily of Bicycle-Friendly Streets characterized by low traffic volumes and slower speeds and are intended for cyclists of all experience levels (City of Los Angeles Department of City Planning 2010b).

The AMP strongly considers actual and perceived pedestrian and cyclist safety as these issues are closely related to whether or not people will walk or bicycle within their community. The locations of recurring collisions involving pedestrians or cyclists help to identify areas that may need improved safety infrastructure. Collision hotspots are identified in the alley network profiles and analyses (Chapter 6).

FIGURE 3.51
BIKE RIDERS IN THE AMP PROJECT AREA









MODE OF TRANSIT

Despite an extensive bus network and access to light rail, the majority of residents in the South Los Angeles project area drive alone to work (Figure 3.52). Public transportation is, however, the second most used mode for commuting to work (Figure 3.53), followed by carpooling (Figure 3.55). Only a small percentage of the population either bicycle or walk to work; the majority of this percentage lives near the University of Southern California campus (Figure 3.54 and 3.56). Despite these statistics (US Census), there is a strong presence of bicycles and pedestrians in some neighborhoods. These numbers are focused on commuting methods to work, and do not indicate how many people walk or bike for other non-commute trips. Initial outreach (Appendix G) indicated that nearly 74% of individuals surveyed walk on a regular basis (multiple times per week to multiple times per day) to local destinations. While some responded that they walk to work, the most common destinations included schools, stores, and parks. A number of residents, including a large percentage of teenagers who must walk to school, have no access to a vehicle, particularly in the northern portion of the project area (Figure 3.57).

CLOCKWISE FROM TOP LEFT:

FIGURE 3.52
PERSONS WHO DROVE ALONE TO WORK

FIGURE 3.53
PERSONS WHO RODE PUBLIC TRANSIT TO WORK

FIGURE 3.54
PERSONS WHO BICYCLE TO WORK

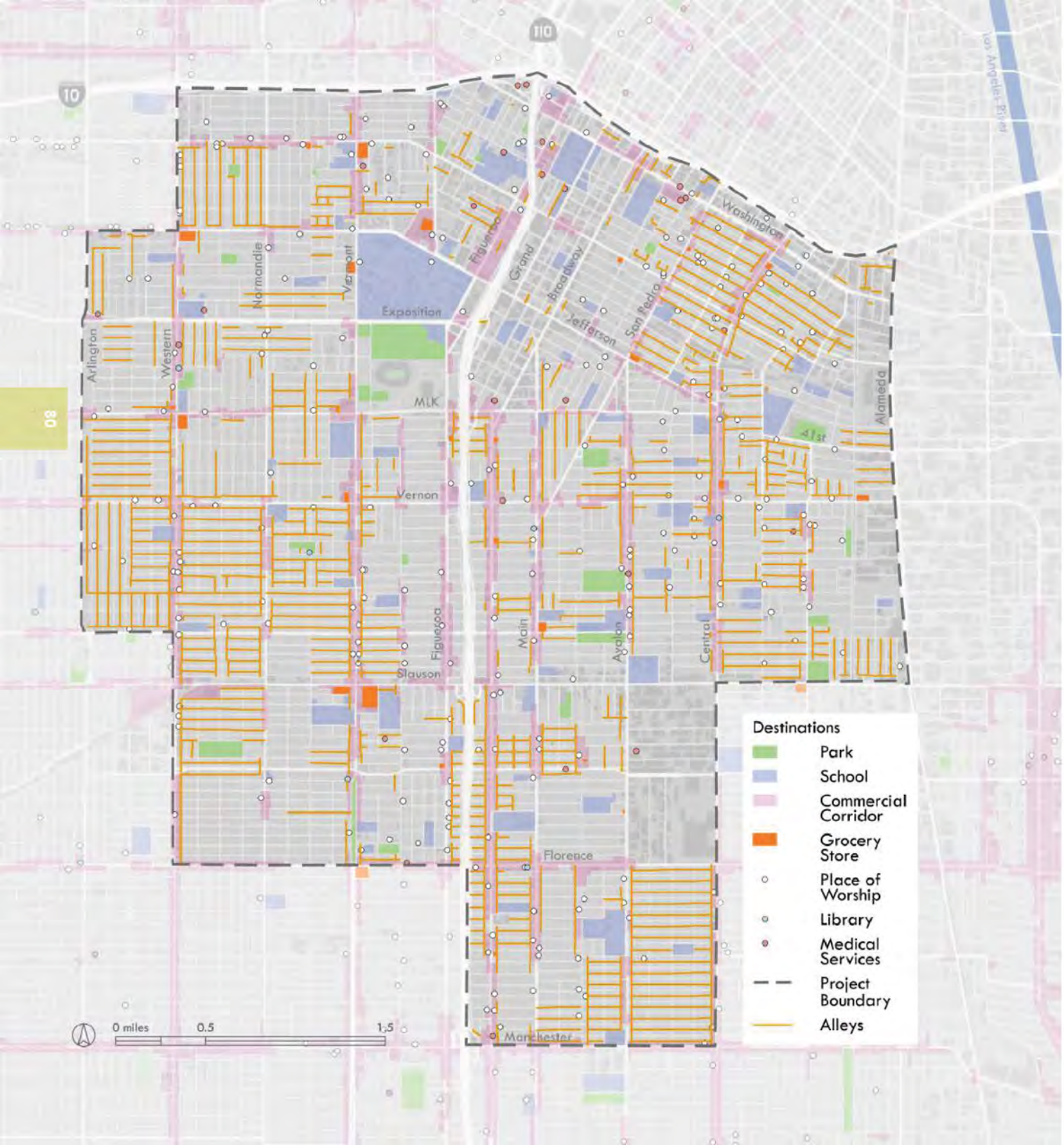
FIGURE 3.55
PERSONS WHO CARPOOL TO WORK



FIGURE 3.56
PERSONS WHO WALK TO WORK IN THE AMP PROJECT AREA



FIGURE 3.57
WORKERS WITH NO VEHICLE AVAILABLE IN THE AMP PROJECT AREA



COMMUNITY DESTINATIONS

Community destinations are the places where people regularly go to in their neighborhood. They act as hubs of activity, generating pedestrian, bicyclist, and vehicle trips. Understanding community destinations, and their relationships and proximity to access routes, is key in determining circulation and connectivity, as well as enabling the AMP to recommend infrastructure that will encourage residents to walk or bicycle more and drive less. In order to determine where to best support pedestrian and bicycle linkages, the following potential community destinations were considered: schools; parks and recreation centers (Figure 3.59); public libraries; healthcare centers, sources of fresh foods (Figure 3.60); and places of worship. These destinations, in addition to being places people are likely to congregate or frequently visit, are places that also provide services or may act as catalysts for positive change within the community. Refer to Figure 3.58 to see the distribution of these resources in the project area.

FIGURE 3.58
COMMUNITY DESTINATIONS
IN THE AMP PROJECT AREA

ALLEY CONNECTIONS

Fourteen percent of Los Angeles' alleys are located within the AMP project area (Figures 3.61 and 3.62). In their current conditions, their functions range from providing access to parking, allowing back-of-house deliveries, serving as garbage collection routes, providing shortcuts for pedestrians and bicyclists, or inhibiting access due to gates or lack of maintenance. Their conditions range in terms of paving (overgrown, unpaved, broken pavement, concrete, asphalt), width, length, and presence of gates (see also the *Los Angeles Alleys Past and Present* section in Chapter 2).

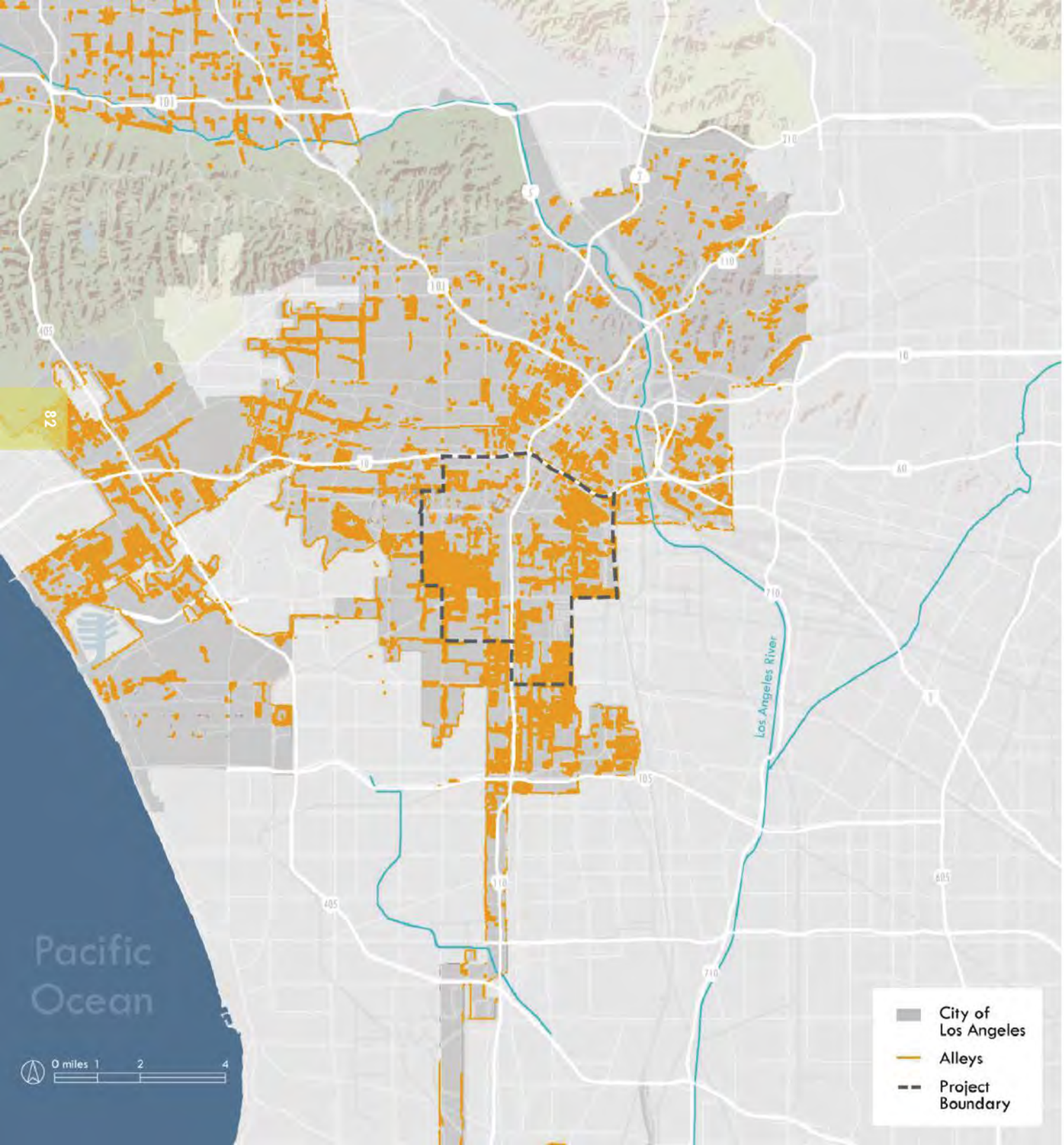
Alleys were extensively gated during the Nuisance Alley Abatement Program starting in 1993 (see also the *Los Angeles Alleys Past and Present* section in Chapter 2). Although these gates have since been ruled illegal many still remain. While official counts of gated alleys are not available, gated alleys in the project area were recorded and mapped (Figure 3.63). Some of these alley gates are locked and never opened, others are always left open, and still others are regularly opened and



FIGURE 3.59 (ABOVE)
YOUTH PLAY SOCCER AT CENTRAL RECREATION CENTER



FIGURE 3.60
PEDESTRIANS IN THE AMP PROJECT AREA, SAN PEDRO STREET AND 23RD STREET



closed by the residents (Figure 3.64). Cues signaling whether or not gates appear to be in use include the condition of the:

- Locks (rusted, cobwebs, missing, etc.),
- Gates (dented, newly painted, etc.), and
- Alleys (paved, unpaved, overgrown with vegetation, etc.).

Gated alleys within the project area impact accessibility and circulation both positively and negatively. For gates that make alleys accessible only to those residents adjacent to them, a rare sense of security is achieved for a community with high levels of crime. The benefit of gates then is their ability to impart a sense of ownership over alleys, better ensuring their maintenance and upkeep. On the other hand, those same gates also act as barriers to alley connections, disrupting grids of alley networks and in some cases, inhibiting the use of alleys entirely, leaving them neglected, overgrown with vegetation, and vulnerable as dumping grounds.

FIGURE 3.61
LOS ANGELES ALLEYS

TRANSPORTATION DISCUSSION

The project area has extensive infrastructure to support personal vehicle travel and public transportation, and these means of transportation are well used. Freeways provide regional connections, but also act as strong barriers between local communities, particularly inhibiting safe pedestrian and bicycle travel. Throughout the project area there is a clear gap in bicycle infrastructure. The smaller scale and lighter vehicular traffic within alleys makes them, with the appropriate infrastructure improvements, a suitable alternate route for pedestrians and bicyclists. Small numbers of residents currently walk or ride their bikes to work, yet many walk or ride to local destinations in their neighborhoods.

The project area contains numerous community destinations, such as schools, places of worship, parks, and grocery stores. The routes between these destinations have the potential to be strong pedestrian and bicyclist linkages within alley networks. Space syntax theory suggests that people will travel along the most direct route, with the least number of turns – even if that route is longer (Stonor and Parham 2011). In some cases, alleys provide the most direct route and these alleys will likely be most used for shortcuts to destinations.

The potential for pedestrian and bicyclist linkages alone does not encourage walking and bicycling; the necessary

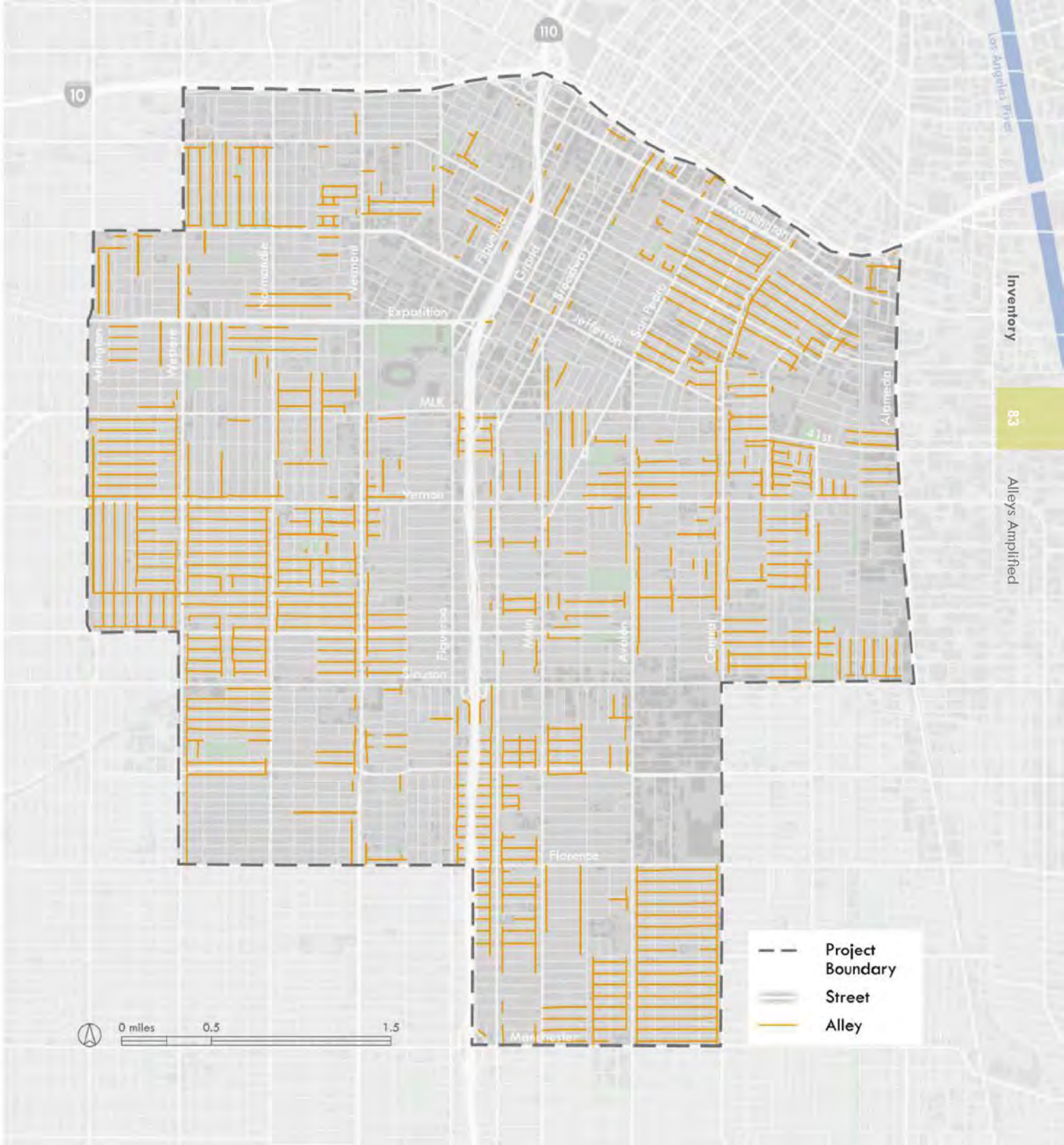
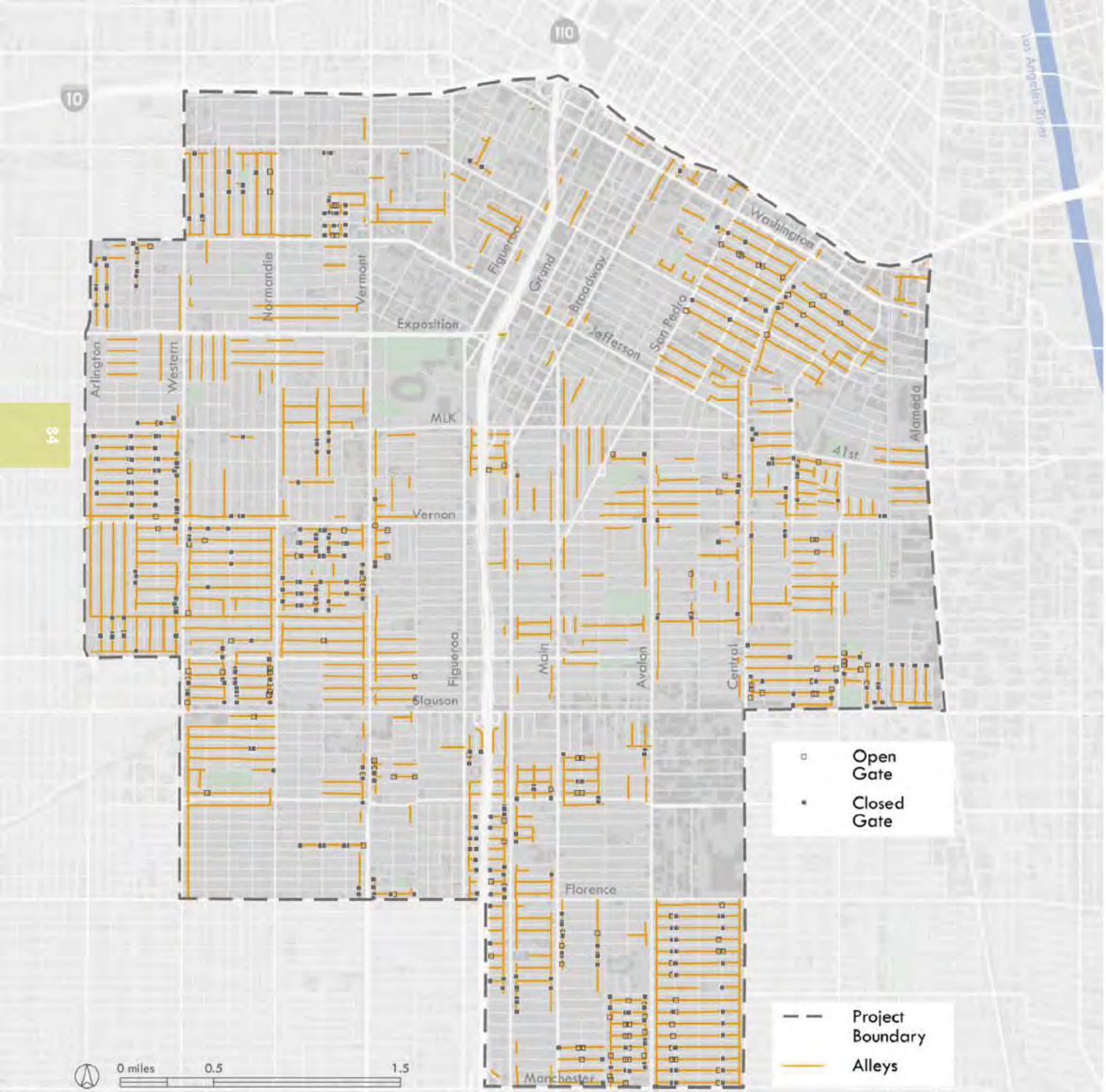


FIGURE 3.62
STREETS AND ALLEYS
IN THE AMP PROJECT AREA



infrastructure and programs for accommodating user comfort and safety must also be in place. The AMP will serve the maximum number of pedestrians and bicyclists by identifying the alleys and streets best able to link to community destinations, redesigning them with safety and comfort elements as well as infrastructure, and creating programs based on community input received through outreach efforts.

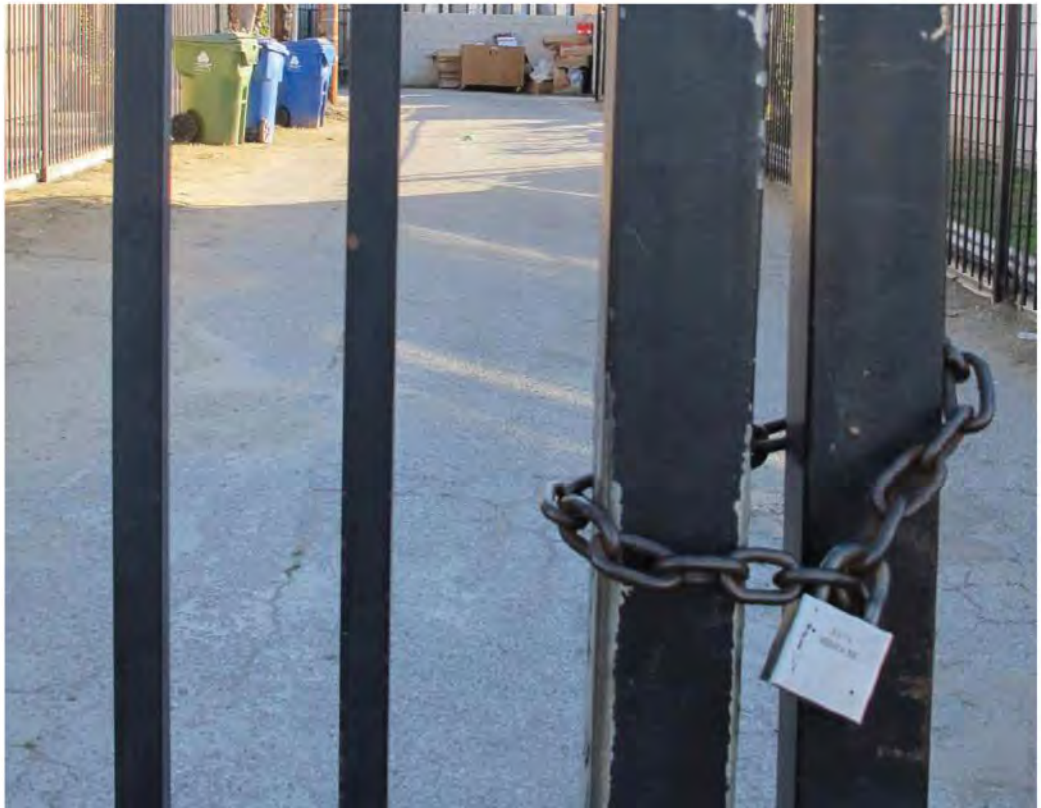
Alleys already provide direct connections between community resources, and are used to some extent as shortcuts. Safety and comfort enhancements to alleys, streets, and sidewalks will make these spaces more usable, and encourage more walking and bicycling in place of short vehicle trips. The AMP supports and encourages pedestrian and bicyclist activities by improving infrastructure and implementing shared-use strategies for streets and alleys, for local neighborhood travel, and for providing connections to transit for regional travel.

FIGURE 3.63
ALLEY GATES IN THE AMP PROJECT AREA

FIGURE 3.64 (OPPOSITE)
ALLEY GATE CONDITIONS
IN THE AMP PROJECT AREA




NOTICE
PROHIBITED
IMPORTANTE







CRIME AND SAFETY

CRIME RATES

Many of the alleys within the project area have a history of crime – burglary, assault, dumping, graffiti – and many of the residents who live alongside them are afraid to go into the alleys because of safety concerns. Residents share stories of gang members hanging out and of burglars accessing their homes through the alleys (Seymour, Bradbury, Wolch, and Reynolds 2008). The Los Angeles Times ranks all neighborhoods in Los Angeles County by per capita violent and property crime rates. Table 3.66 shows that neighborhoods within the project area have high levels of property crimes and some of the highest rates of violent crimes in the County (Los Angeles Times 2011b, 2011c, 2011d).

For each neighborhood in the project area, Figures 3.67 and 3.68 show the number of property and violent crimes per 1,000 people during the six months from March to September of 2011. The side-by-side comparison shows that property crime rates are not associated geographically with high violent crime, and vice versa.

PROPERTY CRIME

Rank	Neighborhood
16	University Park
22	Harvard Park
27	Florence
31	Vermont-Slauson
33	Vermont Square
34	Exposition Park
57	Historic South Central
61	South Park
69	Central-Alameda
100	Adams-Normandie

Los Angeles County

VIOLENT CRIME

Neighborhood	Rank
Harvard Park	2
Vermont-Slauson	10
Vermont Square	11
Florence	12
South Park	13
Exposition Park	15
Central-Alameda	17
Historic South-Central	20
Adams-Normandie	25
University Park	51

Los Angeles County

FIGURE 3.65
SECURITY CAMERAS AND EVIDENCE OF CRIME IN THE AMP PROJECT AREA

TABLE 3.66
NEIGHBORHOODS RANKED BY CRIME, PROPERTY CRIME AND VIOLENT CRIME

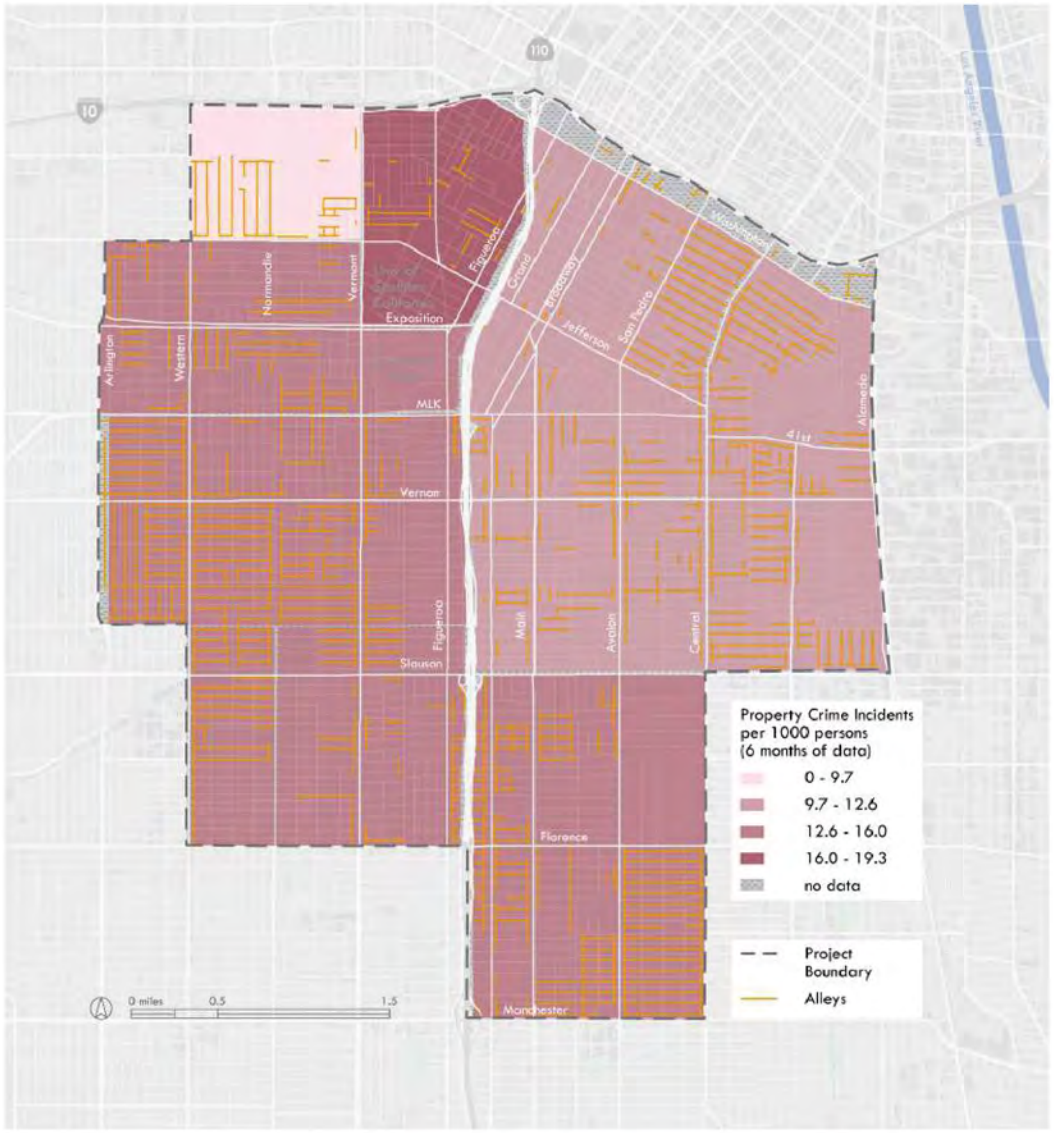


FIGURE 3.67
PROPERTY CRIME RATE IN THE AMP PROJECT AREA

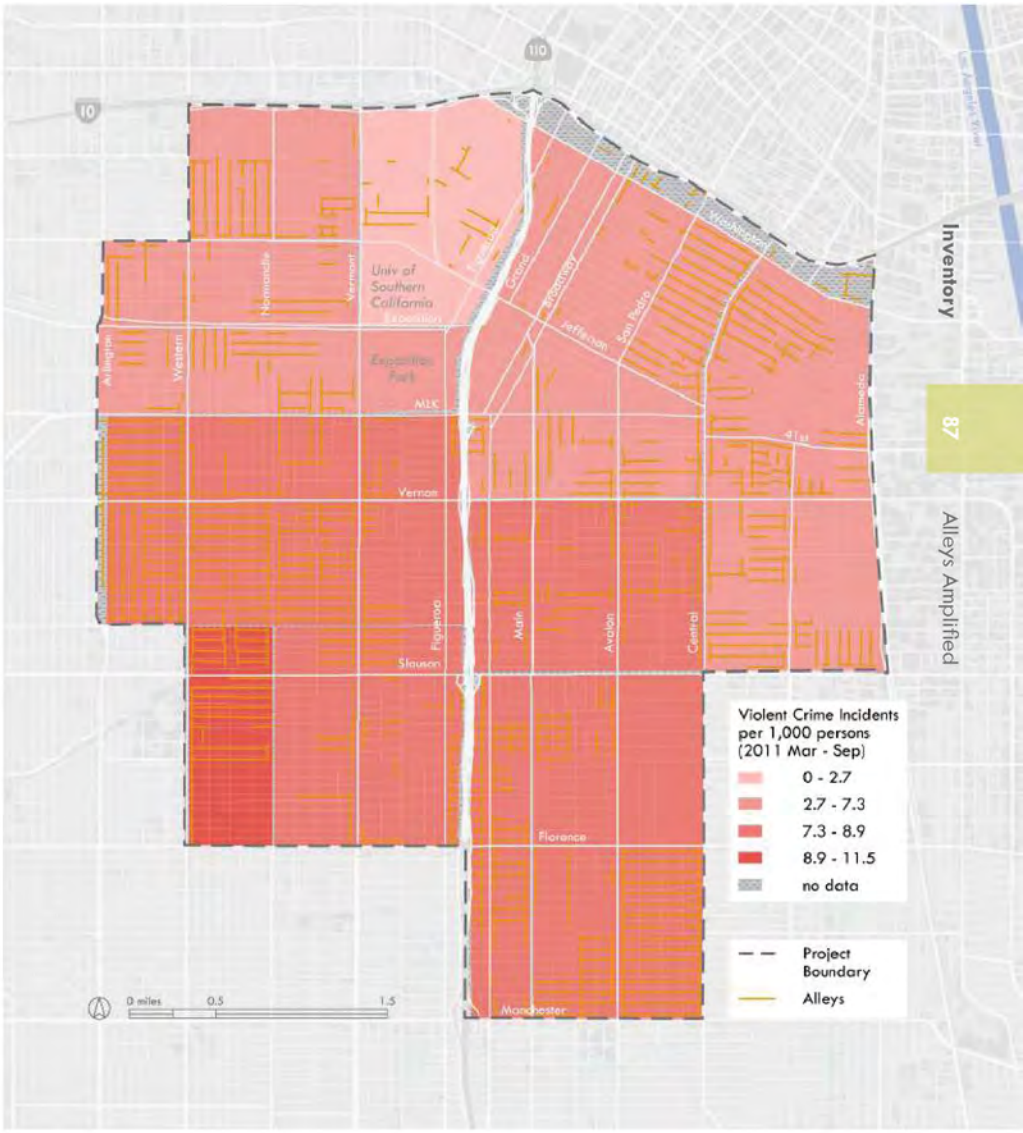


FIGURE 3.68
VIOLENT CRIME RATE IN THE AMP PROJECT AREA





FIGURE 3.69
TAGGING IN AN AMP PROJECT AREA ALLEY

FIGURE 3.70
GARBAGE ILLEGALLY DUMPED IN AN ALLEY

GANGS

The Los Angeles Police Department issues gang injunction maps, which can serve as a resource for identifying where gang activity occurs within Los Angeles. There are currently 37 active gang injunctions in Los Angeles, involving 57 gangs; six of these injunctions are within the project area (Los Angeles Police Department 2011a). High school students who attended a focus group session conducted during phase one of the outreach process mentioned avoiding particular parks, alleys, and streets because of consistent gang activity in those places (Appendix G), and tagging is prevalent throughout alleys (Figure 3.69). Gang activity is a persistent concern in the neighborhoods of South Los Angeles and it is important to be aware of the issue, particularly that the presence of gangs can create barriers to movement throughout communities.

ILLEGAL DUMPING

Illegal dumping is a recurring and widespread problem in alleys throughout the project area. Residents express both concern over the danger of having large quantities of waste behind their homes, and frustration that outsiders often have unrestricted access to illegally dispose of their trash in the alleys after dark. The City conducts alley clean-ups, but they often cannot keep up with the pace of dumping (Figure 3.70).

Alleys with evidence of illegal dumping were mapped (Figure 3.71) during groundtruthing of the project area.

CRIME AND SAFETY DISCUSSION

An overwhelming 73% of all residents surveyed listed maintenance concerns, including illegal dumping which results in unsafe conditions, as reasons for not using local alleyways. In addition, safety concerns were listed by 9% of respondents as a barrier to alley use. Specific illicit activities such as drug use or gangs were often cited as the reason for the perceived safety concerns in the alleys.

Crime and safety within the project area are complex issues and green alley network development can play a role in increasing the actual and perceived safety of alleys and streets through improved local infrastructure. By redeveloping alleys and streets to be safe and usable spaces for social interaction, the AMP will increase "eyes on the street", promote cues to care, and encourage community participation, thereby fostering community ownership and safer neighborhoods (McKay 2004, Painter and Farrington 2001, Jacobs 1961).

INVENTORY SUMMARY

The inventory of the AMP project area reveals a range of existing conditions that support the need for green alley networks in South Los Angeles. Current conditions of site geomorphology, climate, hydrology, vegetation, and wildlife indicate that watershed function and health can be improved, the urban heat island can be reduced, and the urban forest and native vegetation can be increased through green alley design best practices. Similarly, a study of the project area's demographics, land use patterns, transportation infrastructure, community destinations, and crime rates reveal the need for additional open space and recreation opportunities, increased safety, improved infrastructure for walking and bicycling, and opportunities to increase the quality of life for residents of South Los Angeles. AMPlified networks of alleys, streets, and vacant lots hold the potential to address all of these issues.

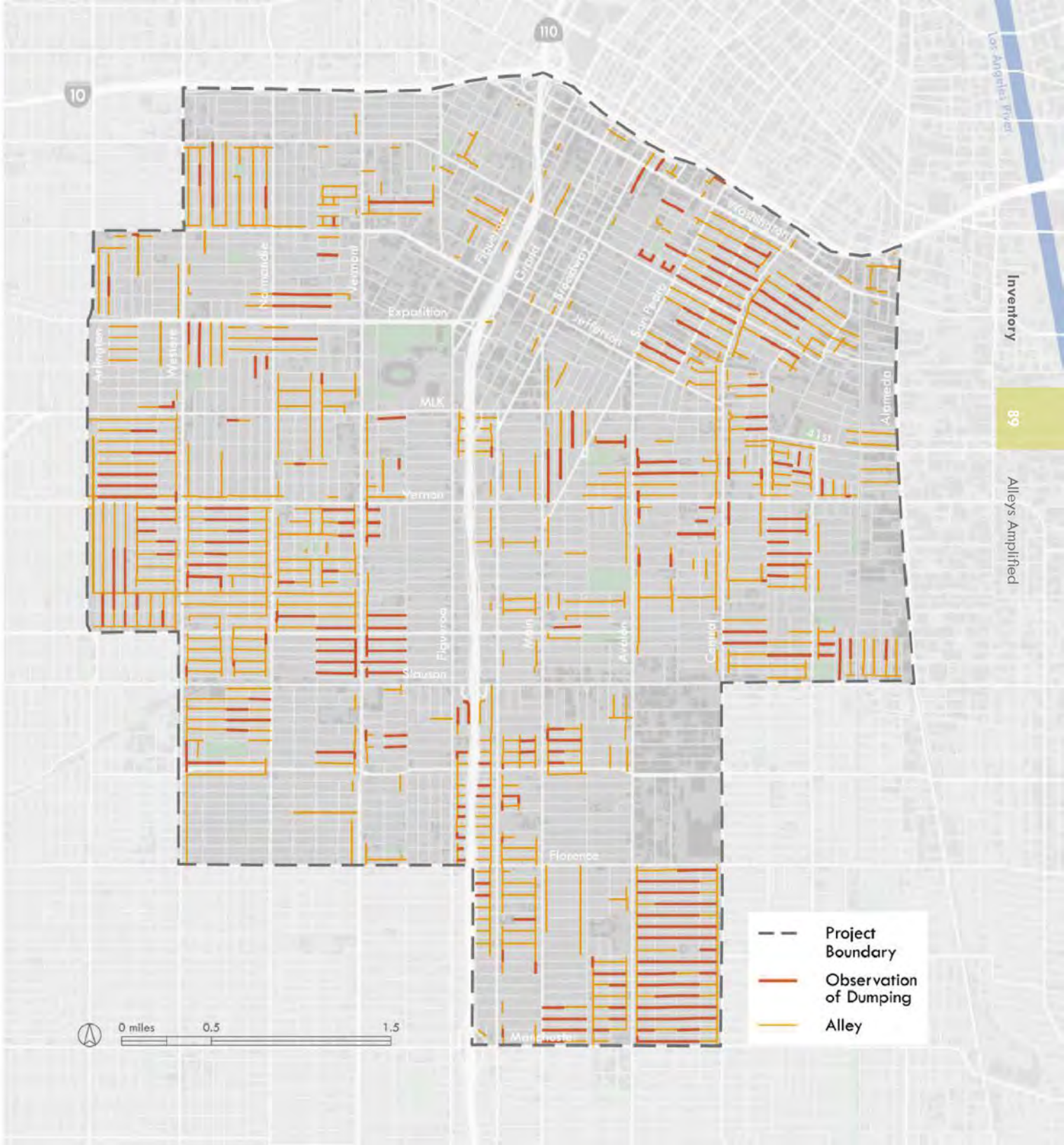


FIGURE 3.71
ALLEYS WITH OBSERVATIONS OF ILLEGALLY DUMPED GARBAGE IN THE AMP PROJECT AREA



GREEN ALLEY NETWORK



SELECTION

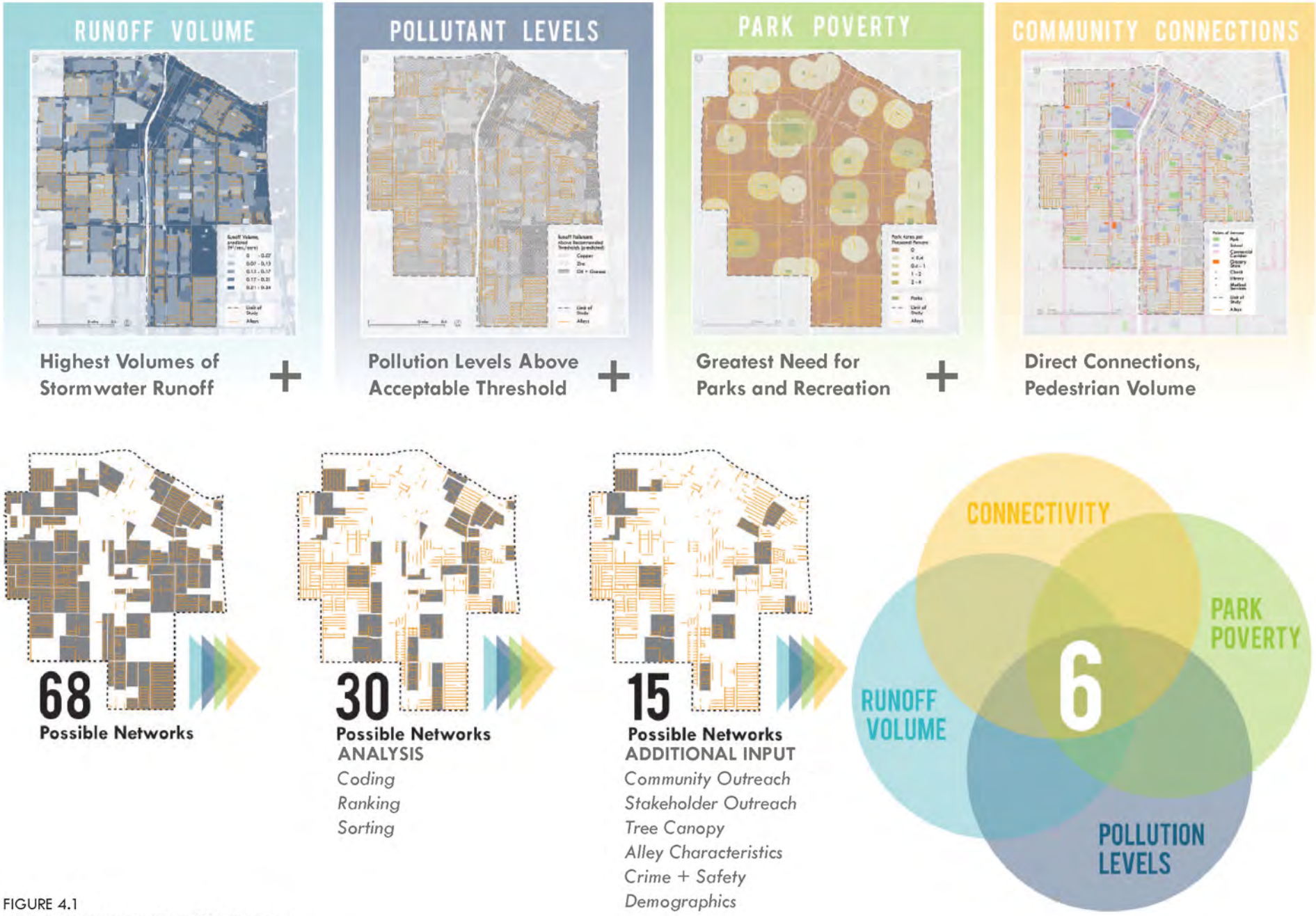


FIGURE 4.1
NETWORK SELECTION PROCESS DIAGRAM

4. GREEN ALLEY NETWORK SELECTION

The network selection analysis reveals the alley networks that are the most suitable for redevelopment and will result in the greatest benefits for:

- Reducing impermeable surfaces and decreasing stormwater runoff by using a wide range of green street and alley design responses,
- Capturing and infiltrating or filtering urban runoff from alleys and streets to reduce pollutants,
- Developing safe, accessible, and comfortable open green spaces, and
- Increasing connectivity and encouraging residents to walk or bike.

The models developed for network selection utilized criteria that varied in distribution and composition throughout the project area (i.e. percent of impermeable surfaces, pollutant levels, locations of community destinations, access to open space, etc.) so that highest priority areas for implementing green alley networks could be identified. Criteria that were consistent throughout the entire project area, for example tree canopy coverage, or that were better suited to analysis at a finer scale, such as crime or collision hot spots, are addressed at the individual network scale in Chapter 6. Therefore all objectives are addressed by the later stages of the AMP development process.

In order to focus the project to key specific networks, models were developed to answer four specific questions relevant to the AMP goal and objectives. Two models are related to hydrologic function and stormwater quality, one to park poverty, and one to community connections. After the models were developed, they were used to analyze all of the 68 possible alley networks within the project area. This involved scoring, ranking, and sorting the networks to select those that exhibited the greatest potential to create positive impacts.

Once the 68 possible alley networks were scored down to the top 15 networks identified with the highest priority, subjective analysis was conducted through the study of aerial imagery, data maps, and site visits. Land uses such as vacant lots, parking lots and large roofs adjacent to alleys were identified for their ability to increase the benefits of a green alley within a given network. Stormwater infrastructure maps were consulted to identify drain inlets, the direction of stormwater flow, and the location the network within the engineered watershed.

Additional information was analyzed, including location of crosswalks, the occurrence of road fatalities, and tree canopy coverage. Through site visits data was collected on alley widths, lighting, perceived safety and visibility with the alleys, pedestrian and cyclist activity, general characters of the neighborhood, and alley connectivity. Refer to Table 4.2 for the significance of these factors in selecting alley networks.

Groundtruthing 15 high-scoring networks from the selection results and reviewing them with project stakeholders, a confirmed a final selection of six high priority networks was identified. These are the first networks within which the AMP recommends implementing green alley infrastructure. Figure 4.1 illustrates the process followed during the network selection stage and details of the full process are explained in the following sections.

ALLEY WIDTHS	Wider alleys provide more space for design elements.
LIGHTING	Increased safety and perception of safety.
VISIBILITY	A clear view through an alley to its exit increases safety and the perception of safety.
STREET ACTIVITY	Alleys in areas that already have pedestrian and cycling activity may experience greater use.
NEIGHBORHOOD CHARACTERISTICS	Evidence of home property care may indicate levels of community cohesiveness, stewardship, and perceptions of safety (Brown, Perkins, and Brown 2004).
ALLEY CONNECTIVITY	Alleys that provide connectivity with destinations through their orientation and visibility.

TABLE 4.2
SITE VISIT INFORMATION TO GUIDE ALLEY NETWORK SELECTION

$$Q = C\,i\,A$$

Where:

Q = Peak discharge in cubic feet per second

C = Runoff coefficient

i = Rainfall intensity

A = Area in acres

FIGURE 4.3
MODIFIED RATIONAL METHOD FOR STORMWATER RUNOFF

$$Cd = (0.9 * IMP) + (1 - IMP) * Cu$$

Where:

Cd = Developed area runoff coefficient

IMP = Percent impervious

Cu = Undeveloped area runoff coefficient

FIGURE 4.4
DEVELOPED AREA RUNOFF COEFFICIENT

HYDROLOGIC FUNCTION: RUNOFF VOLUME

In order to select the networks that would perform the highest in terms of the quantity of stormwater runoff treatment, an initial analysis followed the question: Where are the alley networks with the highest volumes of runoff that can be treated by green alleys and streets?

The basis for the runoff volume model that would answer that question was the modified rational method (MODRAT). The modified rational method uses the equation in Figure 4.3. This equation is a simplified method for determining runoff volume, and is described in the Los Angeles County Department of Public Works *Hydrology Manual* (Conkle, Moyer, Willardson, Walden, and Nasseri 2006). The runoff coefficient was also calculated according to the method described in the *Hydrology Manual*, using the equation in Figure 4.4.

Figure 4.5 illustrates the project area percent impervious data used to calculate IMP, and Figure 4.6 shows the present soil types, where for each of the soil types in the project area, Cu = 0.1 (Conkle et al. 2006). The value used for rainfall intensity ("i" in Q = C i A) was based on a 15 minute duration event, i = 0.267 (Conkle et al. 2006). Runoff volume was calculated for the areas of each of the engineered subwatersheds within the project area (Figure 4.7), and by acre (Figure 4.8). The runoff volume by acre provides finer detail, greater accuracy, and is the model used later in the selection process.

As soils and rainfall were fairly uniform throughout the entire project area, the results of the model revealed that the areas with the highest predicted stormwater runoff volume by acre (0.21-0.24 feet^3/second/acre) were those areas zoned commercial and industrial due to their high percentages of impermeable surfaces. Because of this, alleys and streets located within or adjacent to commercial and industrial zones are best situated to capture and treat stormwater runoff. Areas zoned residential and parks have greater permeability and consequently exhibited lower predicted stormwater volume runoff per acre.

This model has some inherent limitations. The percent impermeability data factored into the calculation of stormwater runoff volume is based on characteristics of land use types in general, not on the actual site-specific conditions within the AMP project area. Impermeability may in reality be higher or lower than the model specifies, but the generalized land use approach provides an efficient means for calculating an estimate at the larger project scale. Additionally, the equation Q = C i A does not result in accurate runoff volumes for calculations involving areas greater than 20 acres (State of New Jersey Department of Environmental Protection 2004). Therefore, it is suitable for calculating stormwater runoff volumes by acre, but accuracy is compromised for the engineered subwatersheds, which are significantly greater than 20 acres in area. An examination of actual conditions at the network scale, focusing on large areas of impermeable surfaces (paved lots and rooftops in particular), will reveal areas with higher volumes of stormwater runoff.

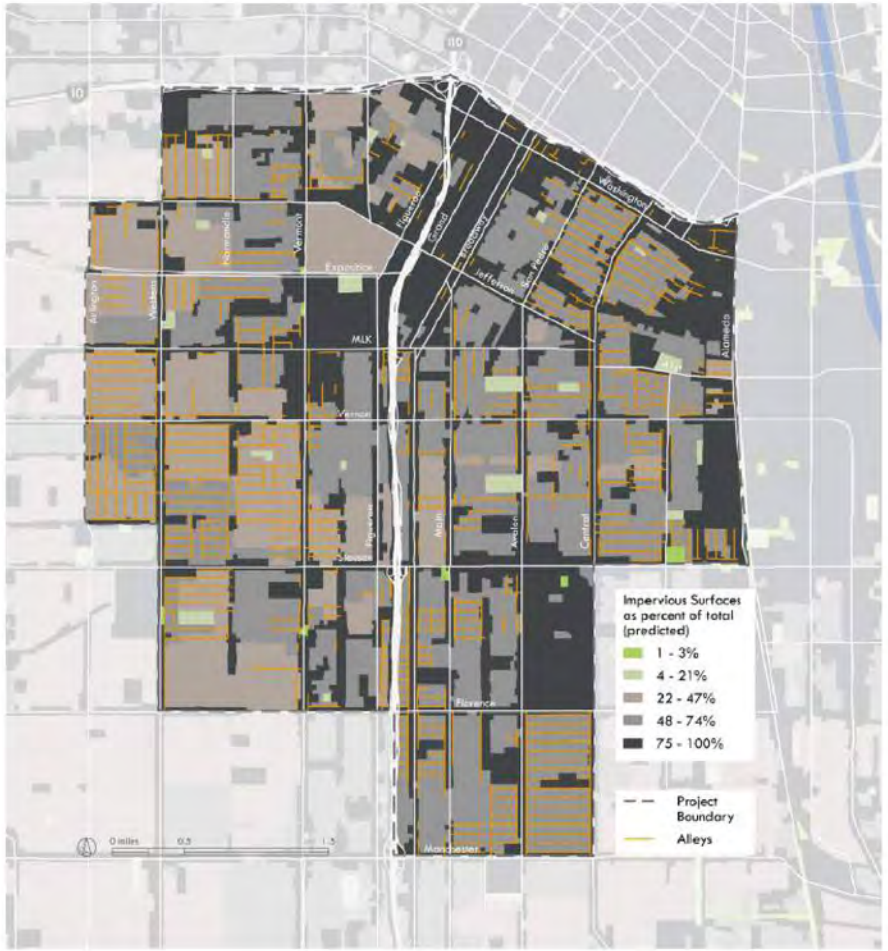


FIGURE 4.5
PERCENT IMPERVIOUSNESS IN THE AMP PROJECT AREA

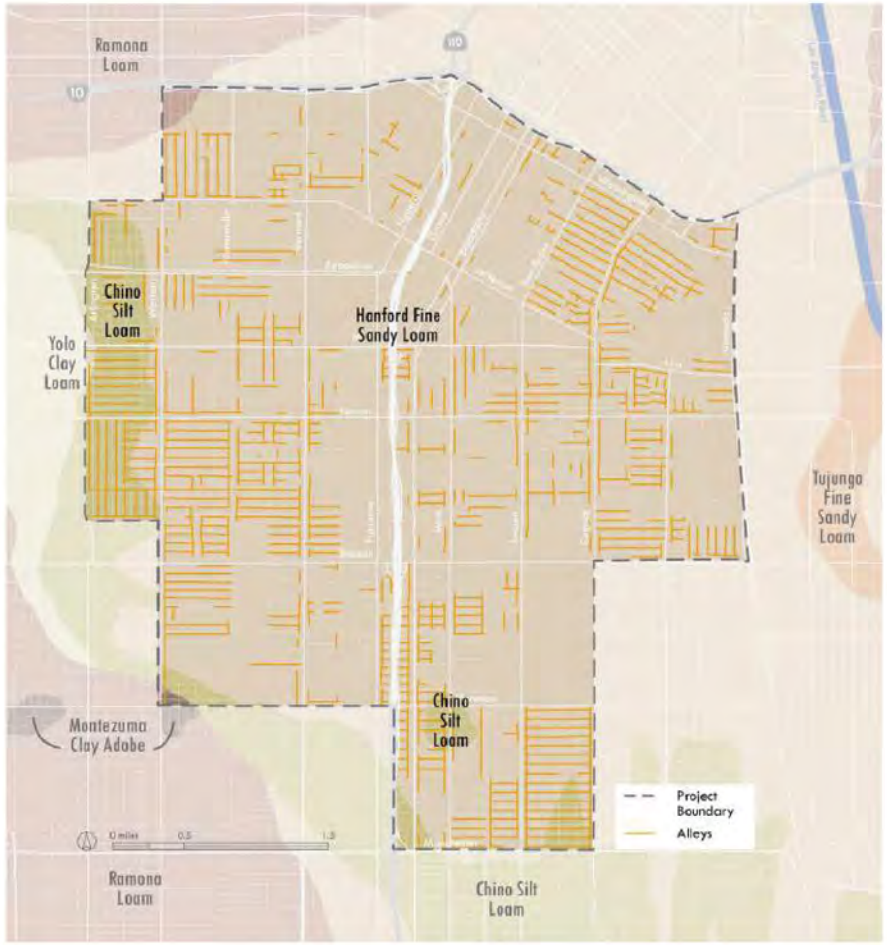


FIGURE 4.6
SOIL CLASSES IN THE AMP PROJECT AREA

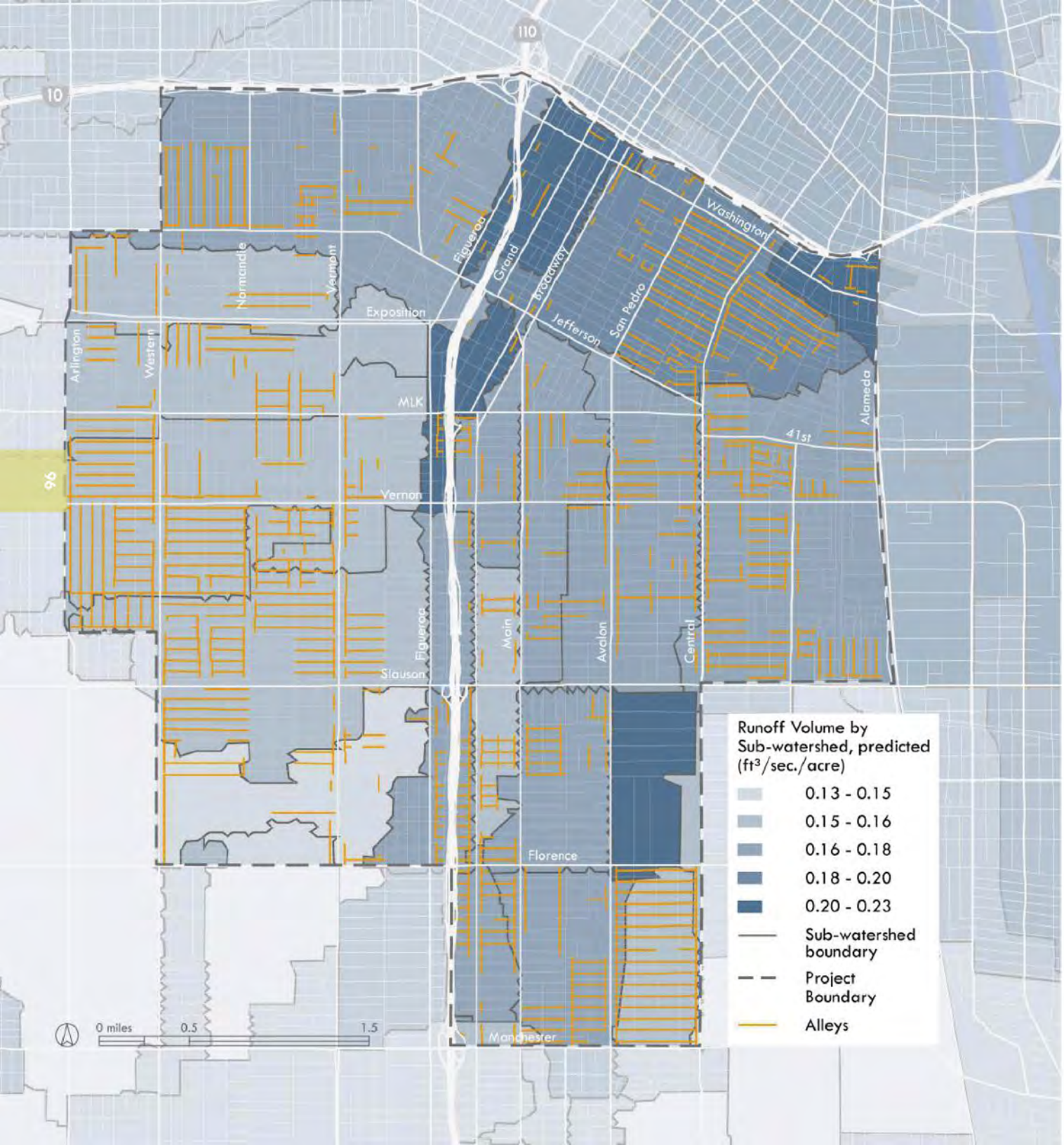


FIGURE 4.7
RUNOFF VOLUME BY ENGINEERED WATERSHED IN THE AMP PROJECT AREA

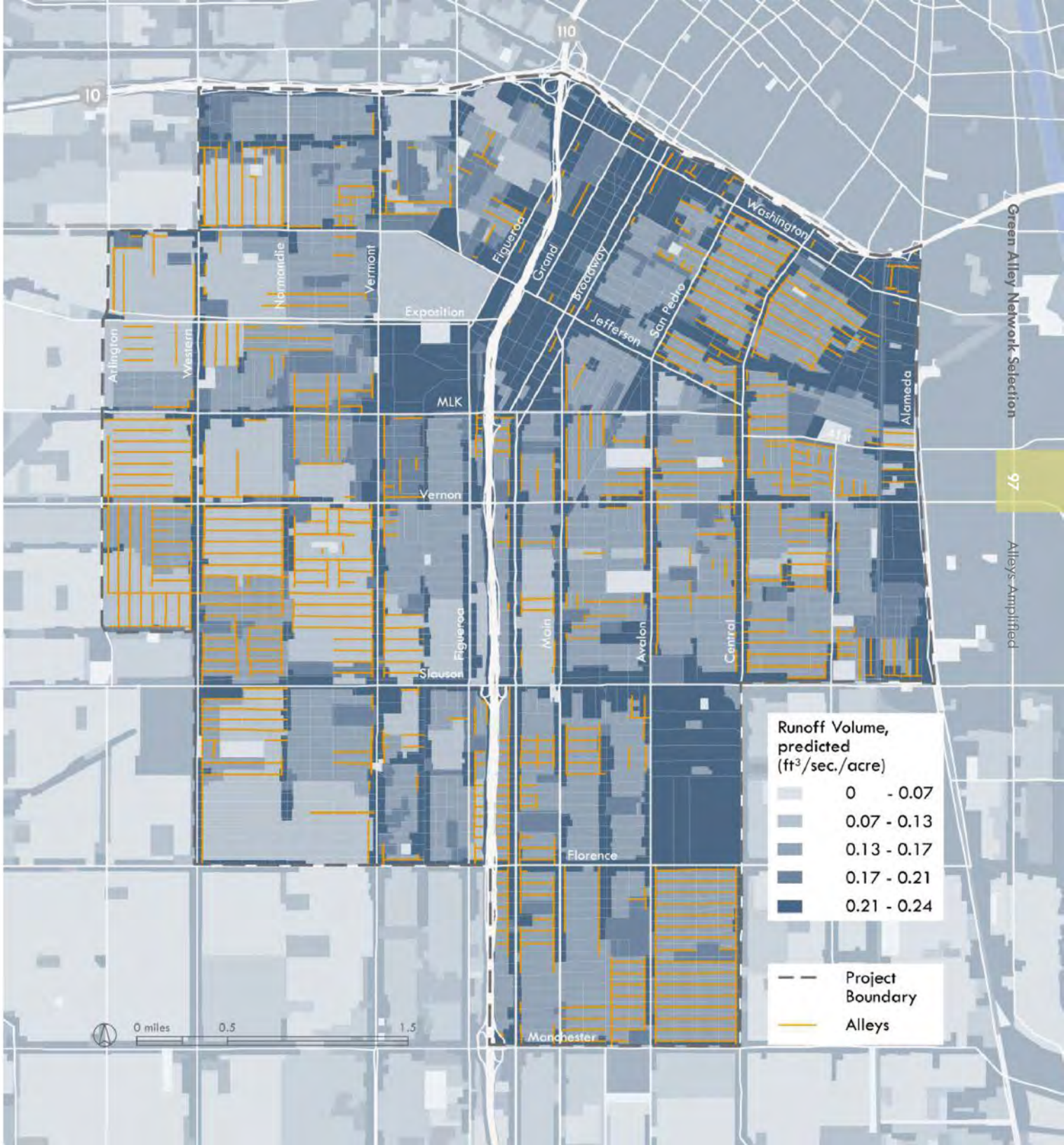


FIGURE 4.8
RUNOFF VOLUME PER ACRE
IN THE AMP PROJECT AREA



FIGURE 4.9 (ABOVE)
POORLY DRAINED ALLEY
IN THE AMP PROJECT AREA

FIGURE 4.10 (RIGHT)
STORMWATER POLLUTANTS

STORMWATER QUALITY: POLLUTION LEVELS

To address the AMP objective to improve the quality of stormwater runoff, analysis efforts followed this question: Where are the alley networks with the highest levels of stormwater pollutants that can be treated by green alleys and streets? This question guided the analysis of networks that, if modified to include stormwater best management practices (BMPs), would result in the greatest improvements in stormwater quality.

The Los Angeles County Department of Public Works provides cumulative event mean concentrations of stormwater pollutants for the 1994-2000 storm seasons, throughout Los Angeles County based on the land use of the drainage area (LADPW n.d.c). Pollutants that were present in detectable concentrations were examined by AMP authors. The focus then turned to only those that could reasonably be treated by green alley network BMPs: copper, zinc, and oil and grease (Figure 4.10).

A pollutant concentration model was developed that identified those areas where copper, zinc, and oil and grease were above the acceptable threshold as determined by the Los Angeles Region Basin Plan or the Environmental Protection Agency (US EPA 2012b, Smith, Phillips, Corado, Trim, Venkatanarayana, Hubner, Moore, and Hicks 1994) (Figure 4.11). The pollutant concentration model allowed the identification of the alley networks with the potentially highest levels of treatable stormwater pollutants, based on land use.

This model, when analyzed side by side with land use mapping (Figure 3.44), revealed that copper was predicted to be above the recommended threshold primarily in the industrial areas, and zinc was predicted to be above the recommended threshold throughout the entire project area except for a few sections of residential zones, as was oil and grease, although not as heavily as zinc.

The utility of the pollution levels model may be limited because the data is based on detected concentrations from throughout the Los Angeles region that have been averaged and generalized by

STORMWATER POLLUTANTS

Copper occurs naturally in rock, soil, plants, animals, and water; is commonly used to make electrical wiring or household plumbing materials; and is generally found at very low levels in surface and groundwater with high levels often resulting from mining, farming, manufacturing operations, and municipal or industrial wastewater releases into rivers and lakes (Centers for Disease Control and Prevention 2011). High levels of copper may lead to irritation of the nose, mouth, and eyes; vomiting; diarrhea; stomach cramps; nausea; and death (Agency for Toxic Substances and Disease Registry 2011a).

Zinc is a naturally occurring element found in air, soil, water, and foods; has many commercial uses and is mixed with other metals to make alloys and bronze; and is widely used in industry to make paint, rubber, dyes, preservatives, and ointments (Agency for Toxic Substances and Disease Registry 2011b). Release of zinc into the environment often occurs as a result of human activities like mining, steel production, coal burning, and burning of waste. Exposure to high levels may lead to stomach cramps, nausea, vomiting, and anemia (Agency for Toxic Substances and Disease Registry 2011b).

Oil and grease are commonly found in stormwater in the form of motor oil, fuel, lubricating oil, hydraulic oil, cooking oil, and animal-derived fats; it poses a wide range of human health problems, including increasing the risk of cancer and negatively affecting the liver, kidney, and blood; and adversely impacts the environment by reducing aquatic organisms' ability to reproduce and survive, harming estuarine species, and creating chemical oxygen demand (StormwateRx 2010).

land use categories. While this provides a useful model for predicting pollutant concentrations that are potentially present for an area, it is an inference and does not represent actual measured conditions. The AMP recommends on-site soil and stormwater testing to determine the actual pollutants present in a given area.

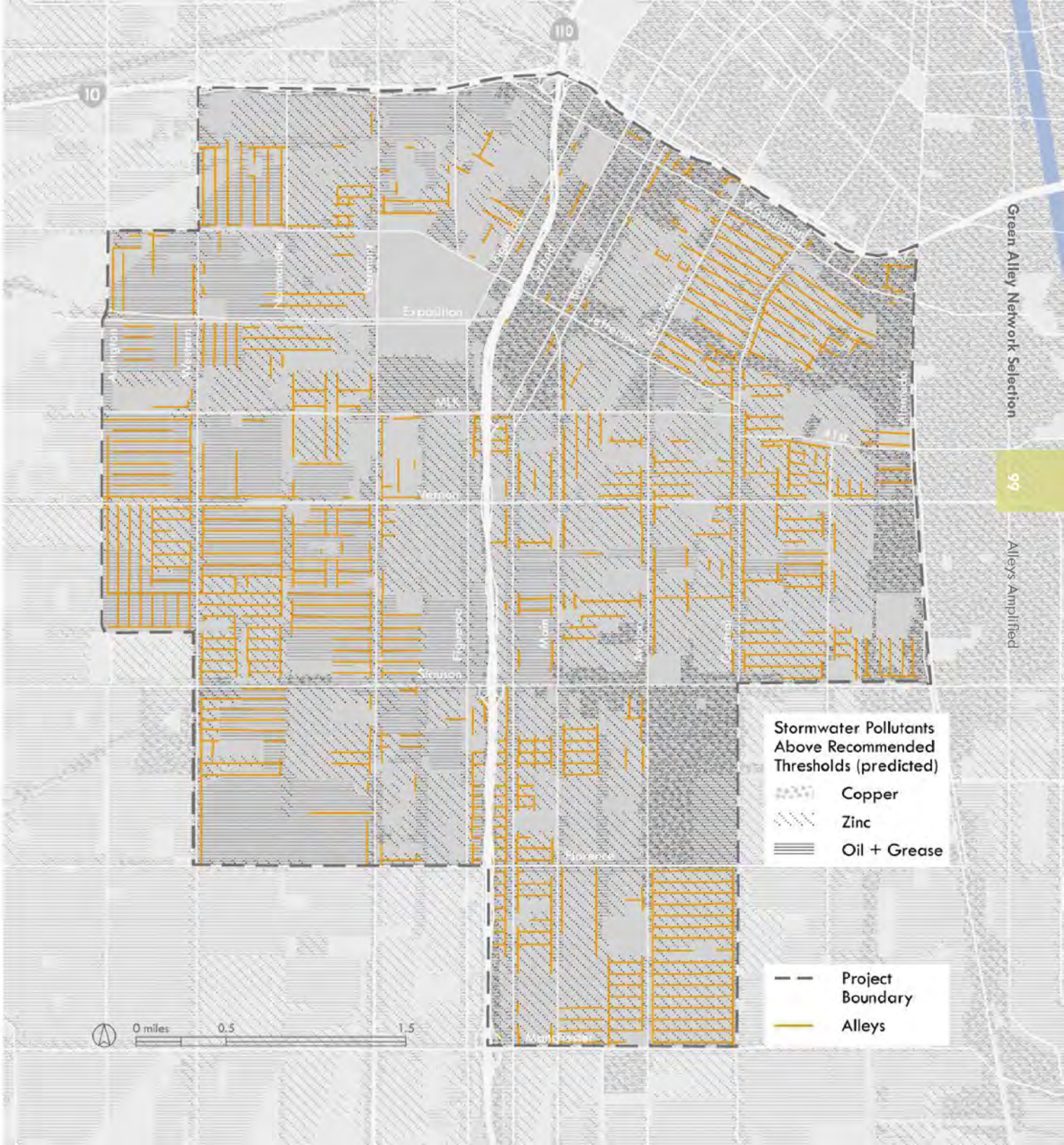
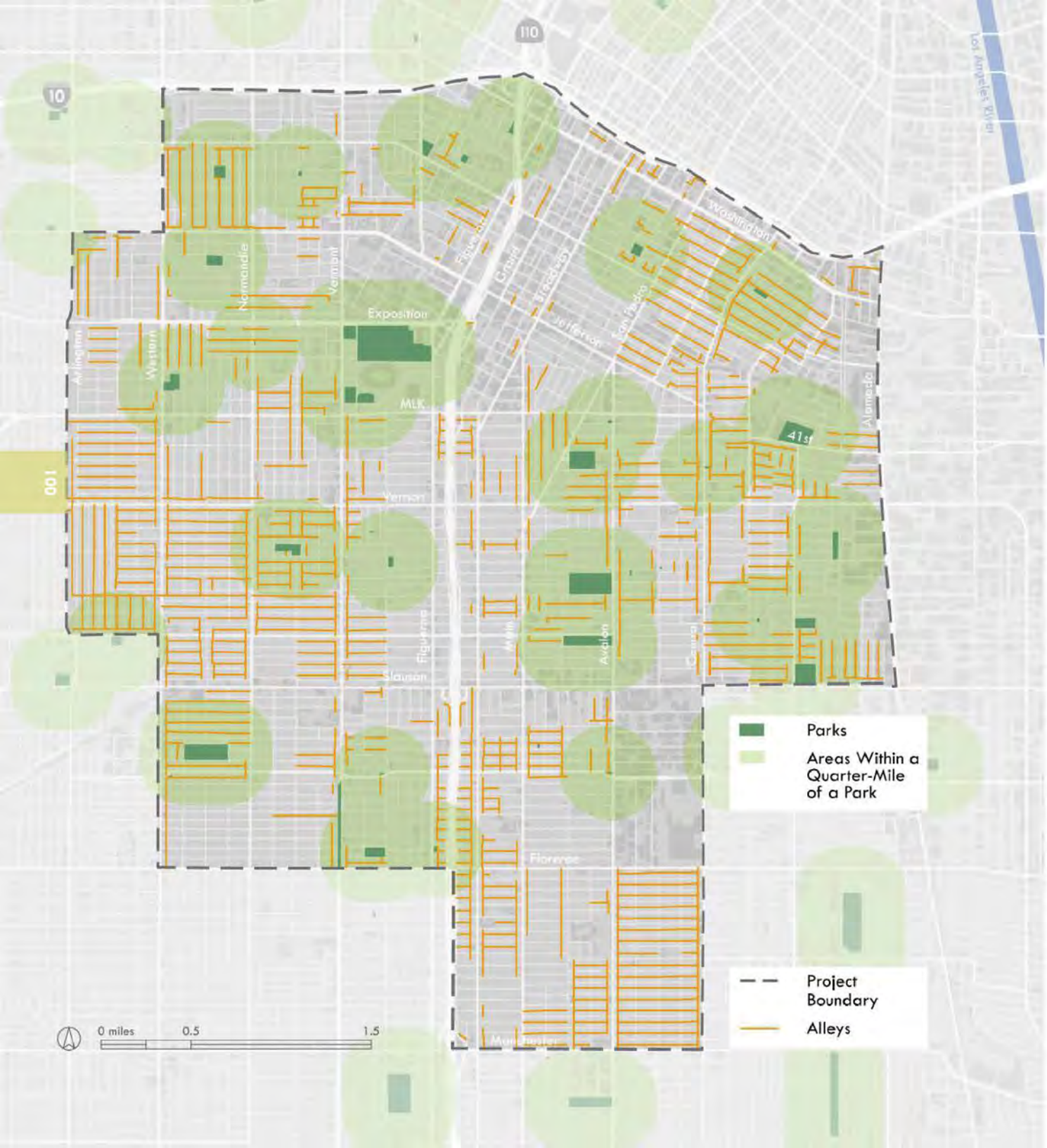


FIGURE 4.11
STORMWATER POLLUTANTS ABOVE THRESHOLD IN THE AMP PROJECT AREA



PARK POVERTY

The AMP aims to create recreation space in the neighborhoods that need it most. In order to identify those neighborhoods, the following question was formulated: Which alley networks are in the most severely park-poor areas where green alleys can provide missing green space and recreation opportunities? The primary factors that went into developing the park poverty model were locations of and distances to existing parks and recreation centers, the acreage of existing parks and recreation centers, and population density. According to the 2009 Los Angeles Recreation and Parks Department Community-Wide Needs Assessment, the recommended service level guideline for parks and open space is 3.6 acres per 1,000 persons for the City of Los Angeles. This recommended service level is a sum of 0.1 acres of mini parks, 1.5 acres of neighborhood parks, and 2 acres of community parks per 1,000 persons. Mini parks are defined as parks under one acre in area, neighborhood parks are between one and ten acres, and community parks are between ten and fifteen acres (City of Los Angeles Department of Recreation and Parks 2009). The project area averages 0.228 acres of parks total per 1,000 persons: 0.014 acres of mini-parks, 0.196 acres of neighborhood parks, and 0.032 acres of community parks per 1,000 persons.

Given that the distance of a quarter-mile, generally a five minute walk, is accepted as the farthest that the average person in the United States is willing to walk to a destination (van Herzele and Weidemann 2003, Wolch, Wilson, and Fehrenbach 2002, Regional

FIGURE 4.12
1/4-MILE FROM PARKS & RECREATION CENTERS IN THE AMP PROJECT AREA

Plan Association 1997), a quarter-mile buffer around existing parks and recreation centers was identified in order to reveal the residences that do not have a park or recreation center within walking distance (Figure 4.12). These are the areas with the greatest need for recreation opportunities.

Furthermore, high levels of population density combined with low acreage of parks make the necessity for more parks in South Los Angeles even more acute. The park poverty model also calculated each park or recreation center's outdoor acreage per 1,000 persons within a quarter-mile (walking distance). Figure 4.13 shows that parks or recreation centers surrounded by the lightest shades of green are the least adequate for accommodating the surrounding population. The park poverty model therefore shows that even while a neighborhood has a park or recreation center, it is seldom large enough to support the high density of the surrounding population.

A limitation of the park poverty model is that it accounts for the differences between specific parks and recreation centers only in terms of physical area. Some parks and recreation centers may provide more or better quality amenities, and some types of parks or recreation centers may be more popular than others. Also physical or social barriers (such as freeways or gang presence) may prevent potential users from going to a park, even if it is within walking distance. A qualitative analysis of specific networks reveals more intricate dynamics between the parks and recreation centers and their ability to serve the surrounding community's needs.

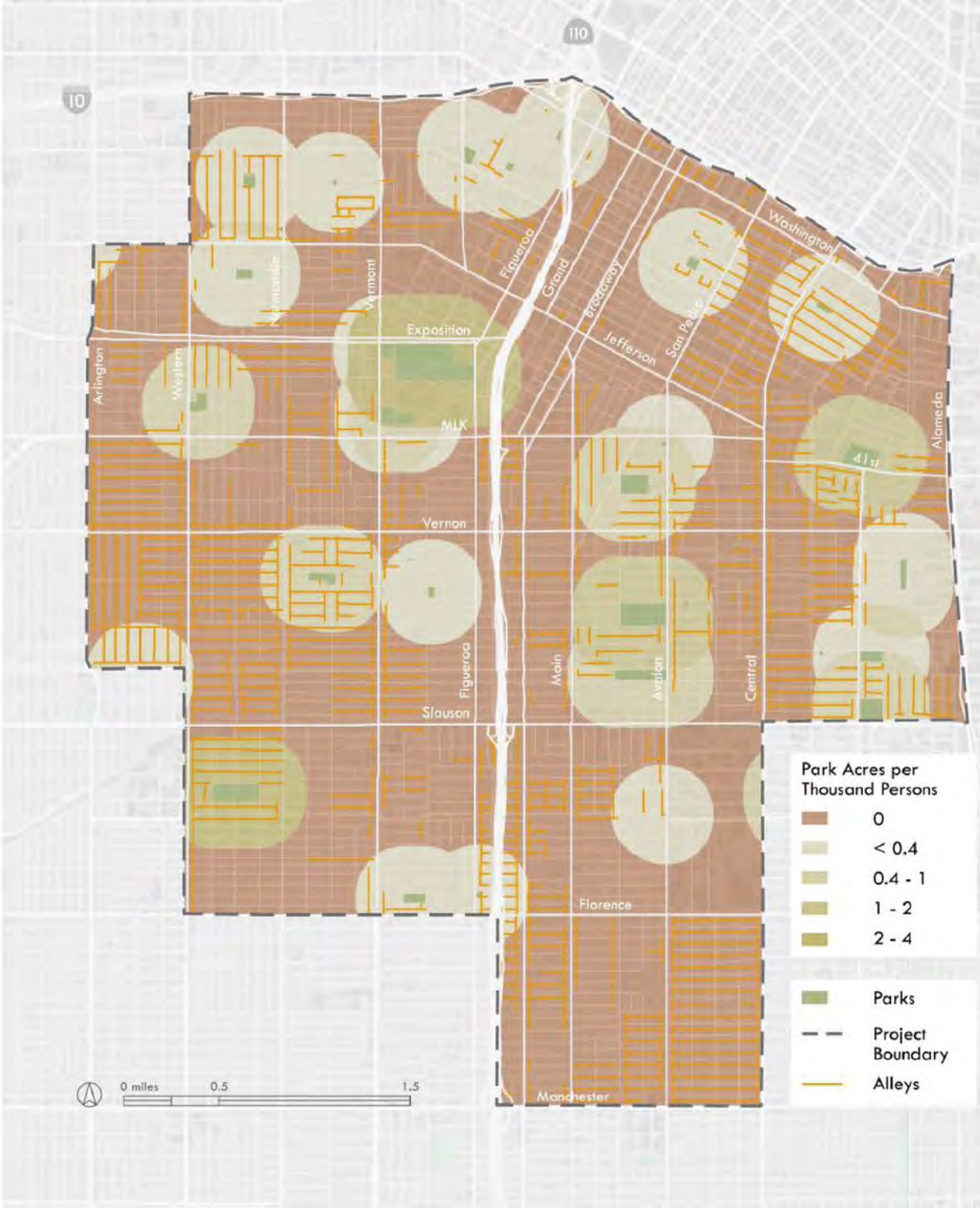


FIGURE 4.13
PARK & RECREATION CENTER OUTDOOR ACREAGE PER 1,000 PERSONS

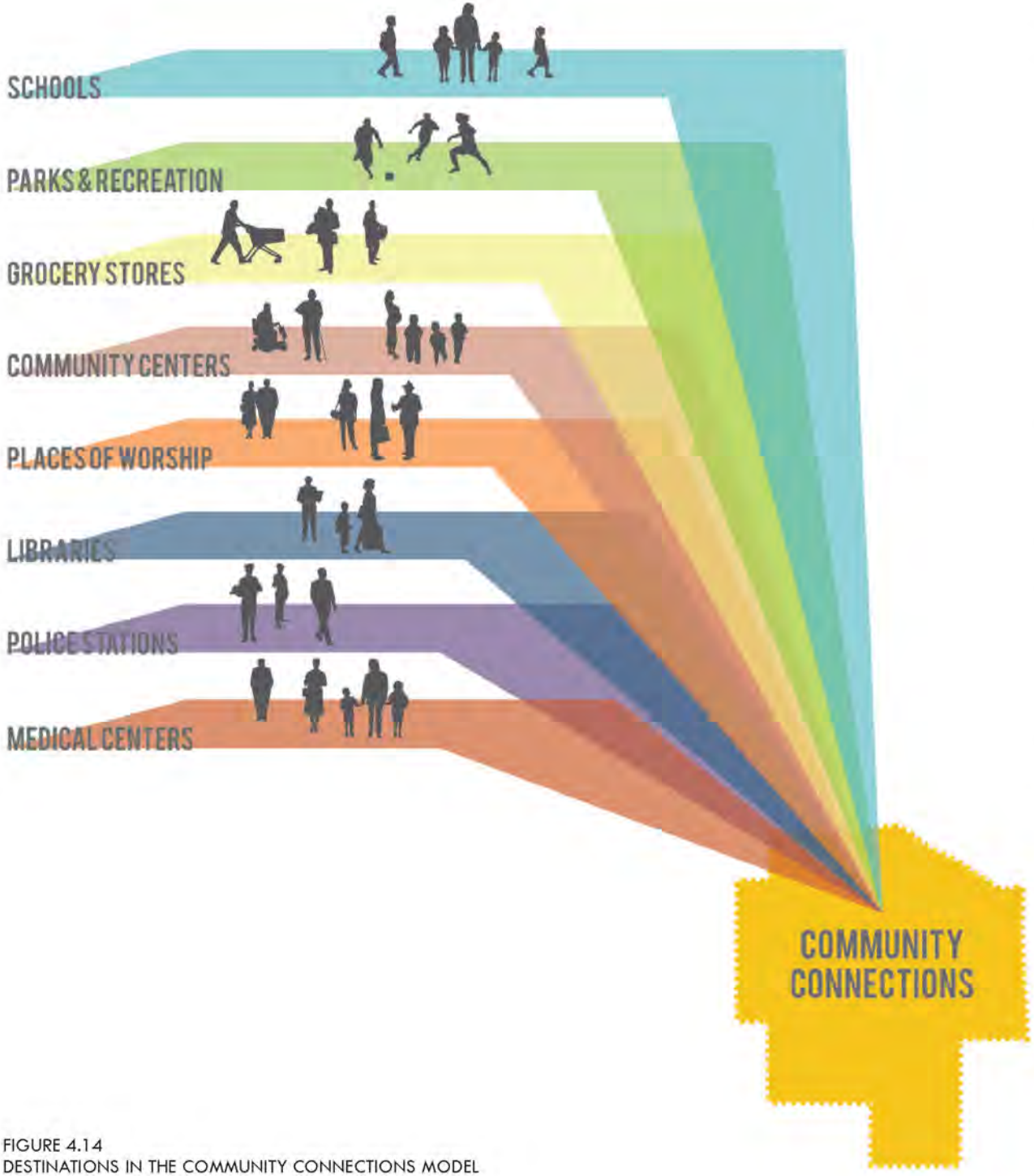


FIGURE 4.14
DESTINATIONS IN THE COMMUNITY CONNECTIONS MODEL

COMMUNITY CONNECTIONS

In order to increase walking and bicycling activity, and reduce the number of vehicle trips, the AMP aims to create alley networks as safe pedestrian and bicyclist networks. Routes that connect key destinations within the community are more likely to be utilized. Therefore, the following question was posed: Which alley networks are in the vicinity of a number of diverse community resources where green alleys and streets can provide pedestrian and cycling connections?
To answer this question, with input from project stakeholders, the types of destinations to map in the project area were identified. Destinations determined to have the greatest potential for generating pedestrian and cycling trips are: schools; parks and recreation centers; grocery stores; community centers; places of worship; libraries; police stations; and medical centers (Figure 4.14). Responses from phase one community outreach efforts (Chapter 5, Appendix G) confirmed that schools, parks, and stores are the most common walking destinations for people in the project area as well as the importance of alleys to teens as shortcuts to and from their school and home, friends' and relatives' homes, restaurants, and public transit. The project area contains many places of worship and grocery markets of all sizes; for this model only those with parking lots were included, as they are more likely to have higher levels of use and generate more pedestrian activity.

These destinations were mapped for the project area, along with commercial corridors, which also serve as destinations for walking and cycling trips. Existing Class II bicycle lanes were noted for their potential to connect to existing cycling networks

(see Figure 3.50). The model revealed that the entire project area contains diverse community destinations with the potential to create strong pedestrian and bicyclist linkages within green alley networks (Figure 4.15). It also showed that schools and places of worship were destinations found consistently throughout the project area; parks as destinations were sparsely scattered throughout, with a clustering of parks in and around the University of Southern California area; and grocery stores and other points of interest were significantly concentrated along commercial corridors.

The community connections model was based on information taken from online mapping applications (Google Maps), expert opinion concerning what places act as popular destinations, and a limited number of community surveys collected during phase one of the outreach process.

The conditions that contributed to the four selection models exist at a coarse resolution across the project area and provided the first level of analysis. Finer resolution data was used in later stages of the network selection process as described in "Final Selection" later in this chapter.

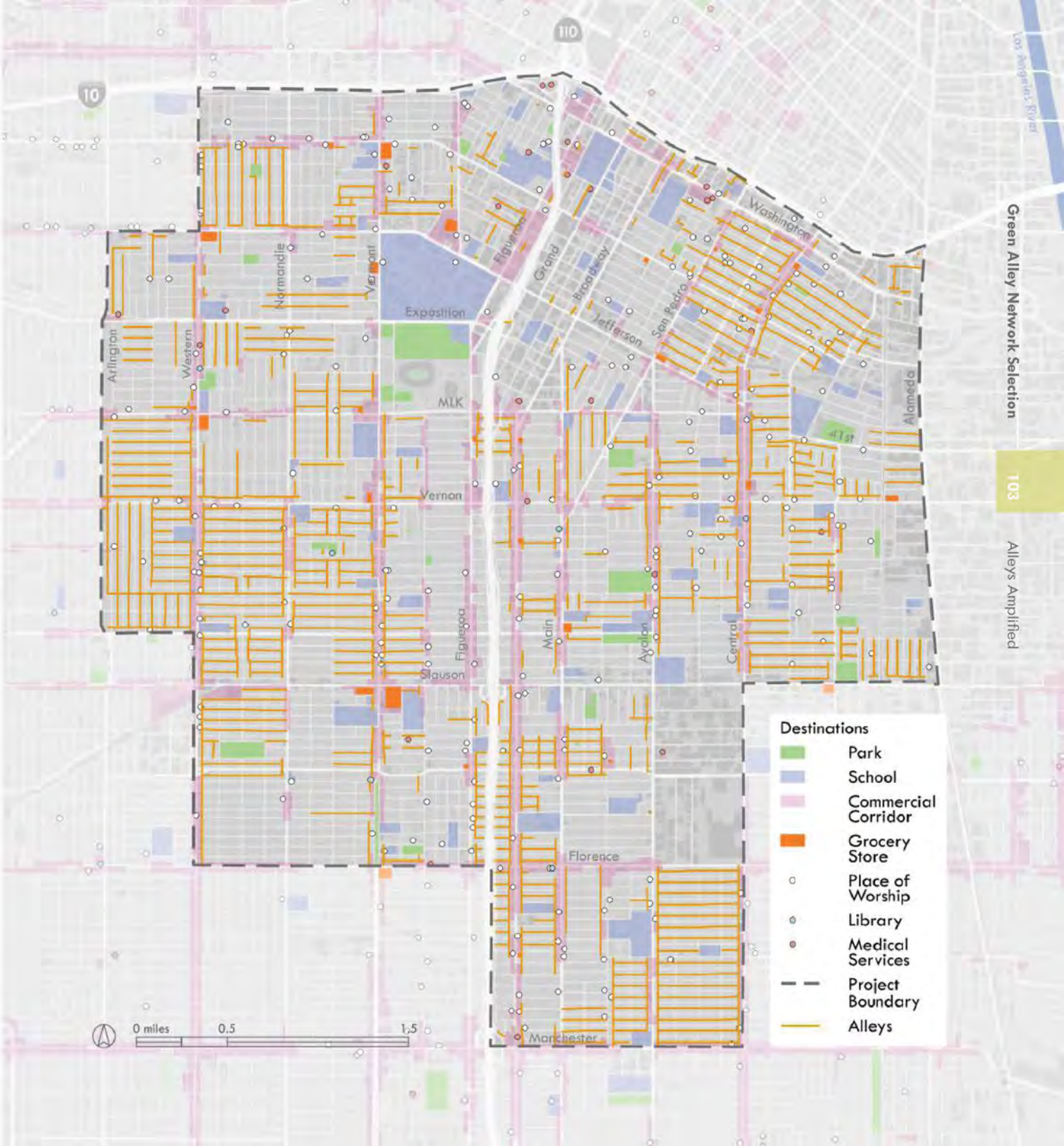
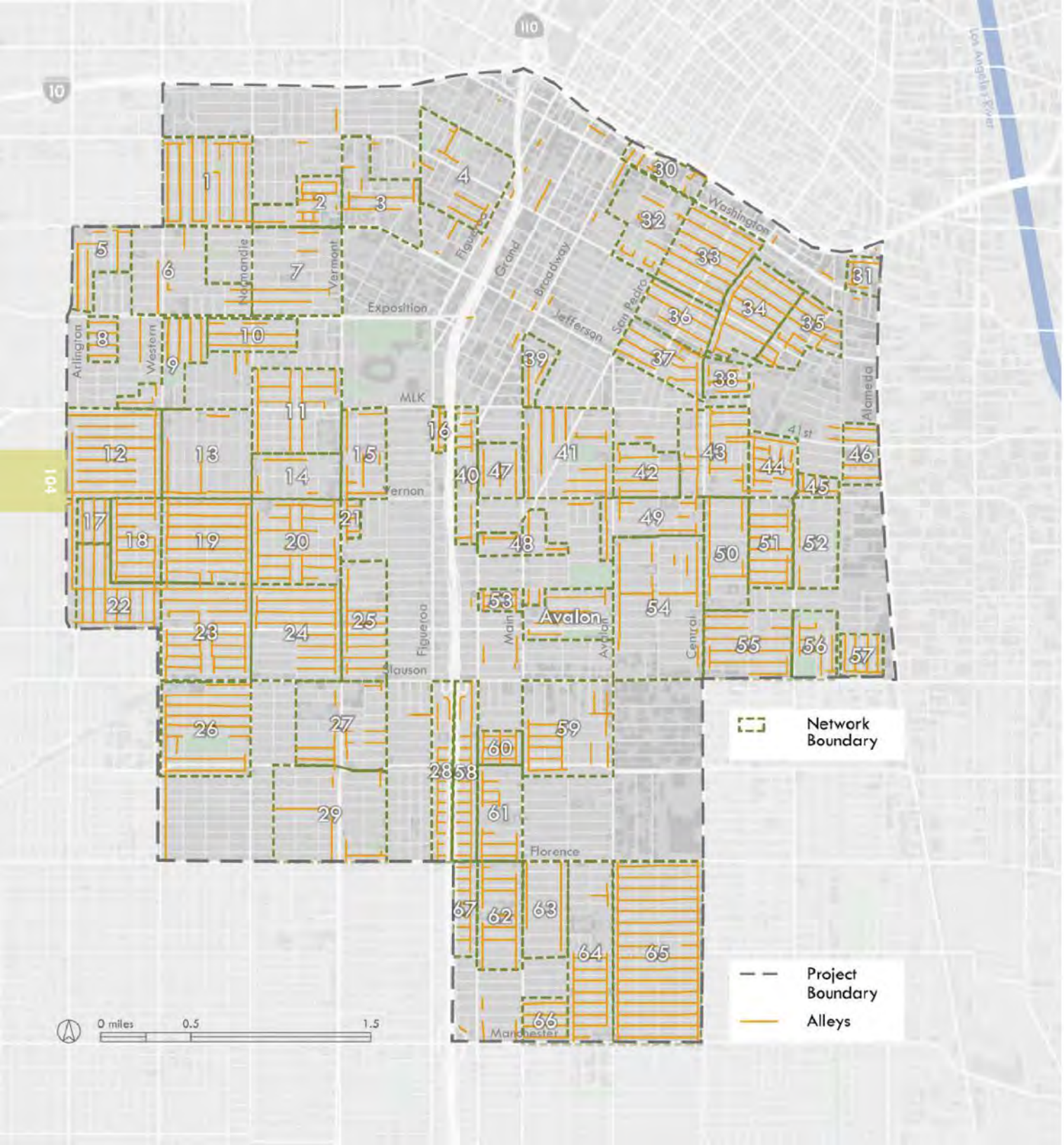


FIGURE 4.15
LOCATIONS OF KEY COMMUNITY DESTINATIONS IN THE AMP PROJECT AREA



4-B. NETWORK SELECTION PROCESS

With the four models related to hydrologic function, water quality, park poverty, and community connections developed, all alley networks in the project area were evaluated according to the results of the models. This evaluation involved scoring each network according to the output of each of the four models, then ranking and sorting to identify the six networks that would provide the greatest opportunities for addressing the AMP's goals.

A total of 68 possible alley networks were identified (Figure 4.16). Some groups of alleys were identified as a distinct network because they formed a natural cluster, separated from other blocks with alleys by areas without any alleys. Networks 1 and 8 in Figure 4.16 are examples. Other groups of alleys within larger areas of adjacent blocks with more alleys, were divided into separate networks based on physical conditions that act as barriers to pedestrian or cyclist movement. Examples of such barriers include high traffic volume streets, elevated freeways (dividing Networks 28 and 58), rail lines, or industrial zones. It is important to note that the boundaries for the 68 networks served as an immediate means to help focus this stage of analysis and not as definitive network boundaries.

FIGURE 4.16
SIXTY-EIGHT POSSIBLE NETWORKS

SCORING NETWORKS

For the 68 networks identified during the network selection process, scores were developed to correspond with each of the model's data ranges. As an example, Figure 4.18 illustrates how scores were assigned to each of the values within the runoff volume model, with each of the data ranges translated to scores of 1 to 5.

For each of the four models, the score of 5 represents the greatest need for AMP intervention, and 1 represents the least need (Figure 4.17). Therefore, in the stormwater runoff model, 5 represents the highest volumes of runoff and 1 represents the lowest volumes of runoff.

The pollution levels model only had four categories of scores instead of five, but 5 was still used as the highest score, in order to correspond with the highest score used in the other three models. A score of 5 was given to areas with all three pollutants above the threshold, a score of 3.75 was given to areas with two pollutants above the threshold, 2.5 was given to areas with one pollutant above the threshold, and a score of 1.25 indicated no pollutants above the threshold.

In the park poverty model, a score of 5 was given to areas beyond a quarter mile from parks, 4 was given to areas within a quarter mile of a park that has the lowest park acreage to population ratio (indicating the size of the park is least sufficient for supporting the immediate population), and down the continuum to 1 representing the areas with the highest park acres per 1,000 persons.



FIGURE 4.17
DEFINITION OF HIGHEST SCORES BY MODEL

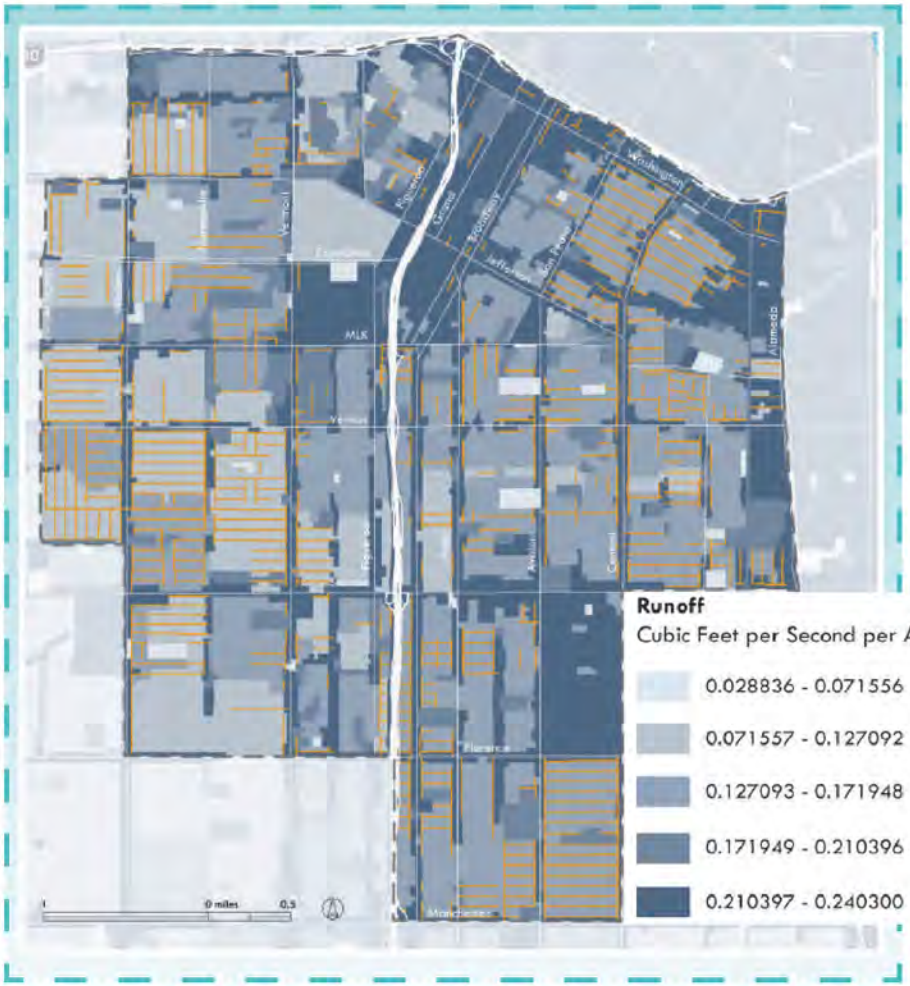


FIGURE 4.18
TRANSLATING MODEL DATA RANGES TO SCORES

NETWORK CODE	RUNOFF VOLUME	POLLUTION LEVELS	CONNECTIVITY	PARK POVERTY	NETWORK SCORE
43	4	3.1	5	4	16.1
30	5	5.0	1	5	16.0
31	5	5.0	1	5	16.0
37	4	3.8	3	5	15.8
16	5	3.1	2	5	15.1
34	4	3.1	4	4	15.1
36	4	3.8	2	5	14.8
39	4	3.8	2	5	14.8
48	4	3.1	2.5	5	14.6
50	4	3.1	2.5	5	14.6
59	3.5	3.1	3	5	14.6
62	3.5	3.1	3	5	14.6
46	4	4.4	1	5	14.4
6	4	3.1	3	4	14.1
27	4	3.1	3	4	14.1
29	4	3.1	3	4	14.1
38	3.5	3.1	2.5	5	14.1
61	3.5	3.1	2.5	5	14.1
64	4	2.5	2.5	5	14.0
32	4	3.8	2	4	13.8
35	4	3.8	1	5	13.8
56	4	3.8	3	3	13.8
25	3	3.1	2.5	5	13.6
40	4	3.1	1.5	5	13.6
49	4	3.1	3.5	3	13.6
53	3.5	3.1	2	5	13.6
60	3.5	3.1	2	5	13.6
67	4	3.1	1.5	5	13.6
Avalon	4	1.5	5	2	13.5
51	3.5	3.1	2.5	5	13.5

TABLE 4.19
TOP 30 NETWORKS



FIGURE 4.20
NETWORK SELECTION PRIORITIES

The six highest priority networks should possess the maximum potential to positively impact runoff volume, pollution levels, connectivity, and park poverty.

The community connections model scoring was based on a additive group analysis. Multiple individuals scored each network based on the number and variety of community destinations in the vicinity of the network, and on how well the alleys serve to connect the destinations. For example, a 5 indicates a greater than average number and variety of destinations, which are also directly connected by alleys. A low score of 1 indicates no connections to community destinations. The final score for each network was determined by averaging the scores assigned by all parties.

Each network was then delineated in a chart with their scores for each of the models. Total combined scores for each network were then calculated (Appendix H). Since for each model, the highest score represents the conditions in which a green alley network could make the greatest impact, networks with the highest total scores are those that can make the greatest positive change to all four measures.

RANKING & SORTING NETWORKS

All 68 networks were sorted from highest to lowest score. The top 30 scores were then separated for further ranking (Table 4.19). In order to further narrow the list of 30, any network that scored in the bottom half for a model (a score of 2.5 or less) was eliminated. Through this process of elimination, ten networks remained that had scores in the top half for all four models, and therefore have the potential to make a significant impact in each of the four categories: stormwater runoff volume, stormwater pollution, park poverty, and community connections.

The process of eliminating those networks with scores of 2.5 or less resulted in ten networks, but it also eliminated three networks that demonstrated the strongest potential for community connections – including the Avalon Green Alley Demonstration Project (described in Chapter 1). Considering the limitations of the network selection models, these three networks were left in the selection for further review and analysis. An additional two networks were added based on the combination of their high park poverty score, configuration of the alleys, and unique character of the surrounding neighborhood. At this point in the network selection process, 15 potential high priority networks were identified (see Top 15 in Table 4.21).

FINAL SELECTION

The goal in the network selection process was to identify six networks that represented the greatest potential for making a positive impact in all four categories of stormwater runoff volume and pollution, park poverty, and community connections (Figure 4.20). The final level of selection then involved narrowing the network selection from fifteen to six. To do so, aerial imagery, data maps, and site visits were utilized to

understand the conditions and dynamics of each of the 15 networks at a more refined, site-level scale.
Then a finer grain inventory was initiated with an examination of aerial imagery of each of the 15 networks in order to identify vacant lots, parking lots and large roofs adjacent to alleys. Vacant lots present opportunities for parks or larger stormwater BMPs; adjacent roofs and parking lots will result in greater volumes of stormwater and additional pollutants, potentially draining into the alley.

Stormwater infrastructure maps were consulted for the locations of storm drain inlets, the direction of stormwater flow, and the location of the network within the engineered watershed. Locating BMPs upstream of storm drain inlets provides the opportunity to capture runoff before it reaches the drain. Downstream drains can also serve as overflows for BMPs during high flow events. Identifying the direction of stormwater flow is important to understand which alleys are upstream of storm drain inlets, and to indicate which alleys are best positioned to capture runoff. Regarding the location within the engineered watershed, BMPs in alley networks that are located at lower levels have the potential to treat greater volumes of stormwater since water from the higher areas of the engineered watershed will flow toward and accumulate at lower elevations.

In addition, mapped data of the locations of crosswalks, the occurrence of road fatalities, and tree canopy coverage were also consulted. Crosswalks indicate existing pedestrian connections and safety infrastructure, road fatalities indicate places that may need improved safety infrastructure, and areas with tree canopy coverage will have lower volumes of stormwater runoff, increased air quality, and reduced urban heat island effect.

Site visits to the 15 networks allowed for the collection of data that was not already mapped or available from external sources. The data collected included alley widths, lighting, perceived safety and visibility within the alleys, pedestrian and cyclist activity, general characteristics of the neighborhood, and alley connectivity. Refer to Table 4.2 for the significance of these factors in selecting alley networks.

Individual assessments of the conditions of the 15 networks based on the data collected from aerial imagery, maps, and site visits were used to make subjective analyses to select the six networks with the highest potential for green alley networks to benefit the community. After this analysis and selection, AMP authors identified six networks; the final selection scores are recorded in Table 4.21. Networks 9, 20, 37, 43, and the Avalon Network all received the maximum score, and were selected as five of the six high priority networks. For the sixth network, Networks 29, 49, and 62 each ranked at a 50% score. The benefits of each of these networks was discussed ultimately leading to the selection of Network 62 as the sixth high priority network since it received the highest combined score from the selection models and also provided a more even distribution of green alley networks throughout the project area.

TABLE 4.21
FINAL NETWORK SELECTION

NETWORK CODE	FINAL SELECTION SCORE
1	1
2	0
6	0
9	4
20	4
27	0
29	2
34	0
37	4
43	4
49	2
56	1
59	0
62	2
Avalon	4



4-C. NETWORK SELECTION RESULTS

The six high-priority networks are listed below and their locations are shown in Figure 4.22. With the exception of the Avalon Green Alley Demonstration Project Network, names provided for the networks are temporary and may be changed by the residents of the network neighborhoods.

- Network 9 → Western-MLK
- Network 20 → Vermont Square
- Network 37 → Quincy Jones
- Network 43 → Central-Jefferson High
- Network 62 → Broadway-75th
- Network 68 → Avalon Green Alley Demonstration Project

FIGURE 4.22 (LEFT)
LOCATIONS OF THE TOP SIX NETWORKS IN THE AMP PROJECT AREA

FIGURE 4.23 (OPPOSITE)
ALLEY IN THE HIGH-PRIORITY QUINCY JONES NETWORK

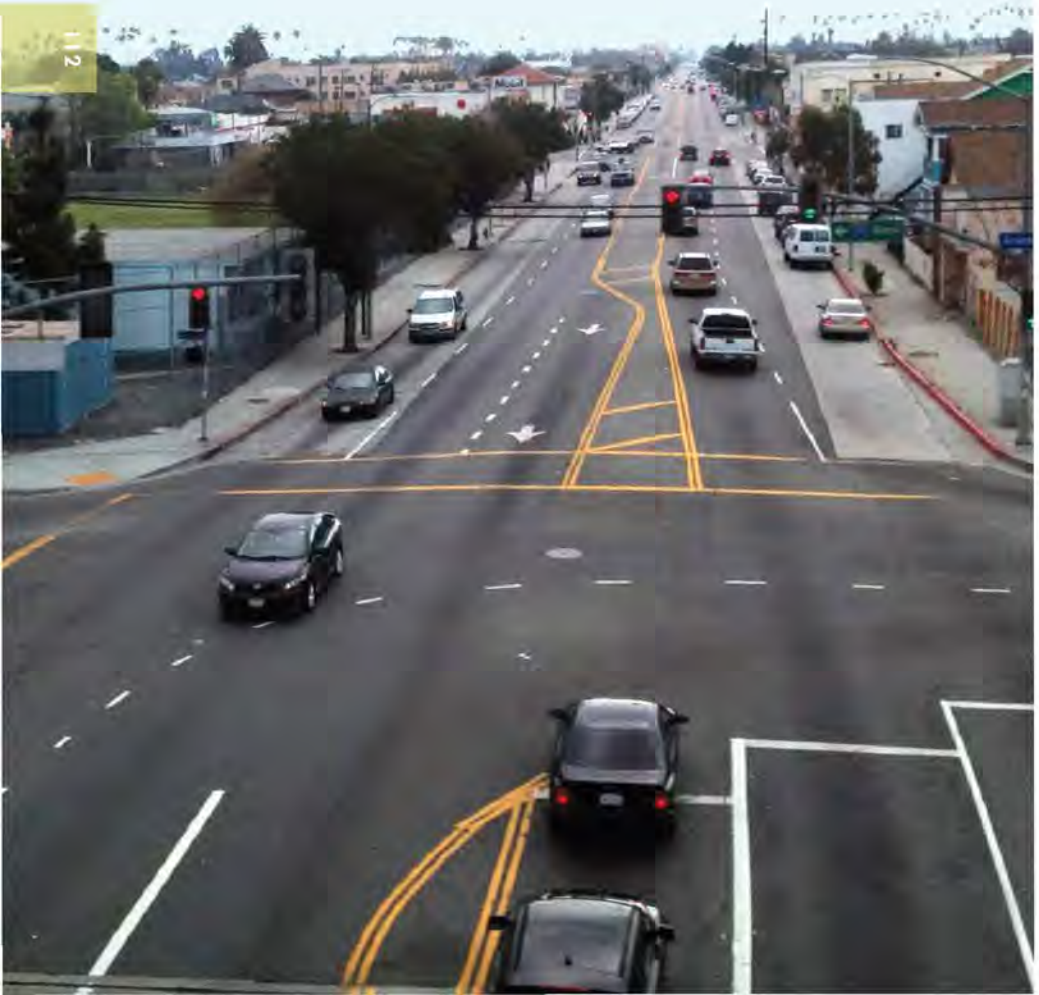
CANDY



PROJECT AREA



ANALYSIS



5. PROJECT AREA ANALYSIS

Analysis brings together information gathered during previous stages of the project. It combines the most relevant existing conditions, identified through the project area inventory, with the desired alley infrastructure approaches, determined through outreach and input, in order to identify the most salient issues, opportunities, and constraints affecting the project.

5-A. PRELIMINARY COMMUNITY INPUT

To further enrich the process of project area analysis, preliminary community outreach activities were conducted with local residents. The outcomes of this outreach assisted in the refinement of key categories of potential design responses, or program elements, that guide design. During this preliminary outreach stage, three approaches were employed to reach different alley user groups within the project area. These included sidewalk surveys, a high school focus group, and neighborhood council surveys. Surveys elicited specific information on what community members like about their favorite open spaces and what they like to do there, how often they walk or bicycle in their community and for what reasons, and what they like and dislike about the alleys in their neighborhood as well as how they use them. This information was used by the AMP authors to gain a greater understanding of the project area community and its residents. In addition, outreach to key stakeholder groups was conducted and incorporated into the analysis. A complete list of materials and summaries of the preliminary outreach activities are included in Appendix G. Finally, the findings from The University of Southern California Center for Sustainable Cities 2008 report entitled *Uses and Perceptions of Alleys in South Los Angeles* were consulted and incorporated into the selection of the final program categories.

DESIGN AND PROGRAMMING SELECTION AND PREFERENCES

The University of Southern California Center for Sustainable Cities issued a 2008 report entitled *Uses and Perceptions of Alleys in South Los Angeles*. This report presents results from a series of focus groups concerning alleys, one of which was conducted in South Los Angeles.

The report first provides the findings of residents' current uses and perceptions of alleys, and then concludes with

FIGURE 5.1
IMPERMEABLE SURFACES CARPET THE AMP PROJECT AREA

program recommendations from the residents themselves. The report reveals that adult residents avoided alleys unless they absolutely needed to use them (for example, to access their garage, take a shortcut, or put out the trash), and that safety was a major concern for residents (Seymour et al. 2008). Conversely, participants mentioned that children had far less fear of the alleys and that they saw children using the alleys for recreational purposes (Seymour et al. 2008). Given these perceptions and uses, alley revitalization elements and interventions suggested by the USC report included: lighting, security cameras, speed bumps, separated walking path, gates (though participants gave mixed responses on the benefits of gates), regulatory signage, play and sports equipment, restrooms, drinking fountains, ornamental plants, graffiti art, and culturally-relevant murals (Seymour et al. 2008).

PROGRAM CATEGORIES

Individual input from project area stakeholders and the community were developed into 12 key categories of potential design responses. These responses helped to focus the project area analysis. These categories are: infiltration best management practices (BMPs), filtration BMPs, community recreation space, shared use streets, pedestrian and bicyclist routes, increased visibility in alleys, limited access to alleys, community involvement and stewardship, trees and vegetation, utility corridors and parking, public amenities, and aesthetic quality. The development of these 12 categories from the outreach and input responses is illustrated in Figure 5.2. These categories respond to the basic needs of stakeholders and community members based upon their expressed perceptions, desires, and recommendations, and are referred to as program elements.



FIGURE 5.2
DEVELOPMENT OF KEY PROGRAM ELEMENTS

The Inventory and the Community Outreach and Input stages revealed overarching issues affecting the AMP project area. The AMP goals and objectives guide green alley network solutions that address these issues.

DEGENERATED HYDROLOGIC FUNCTION

The project area is situated over a groundwater forebay and has the potential to recharge groundwater supply for the greater Los Angeles region, yet the project area is on average 50 to 75% impermeable. Instead of percolating through the soil, most of the rainwater that falls within the project area is directed through an extensive network of stormdrains, pipes, and concrete channels to the ocean. Through various responses implemented in alleys, streets, parkways, and vacant lots, green alley networks have the potential to disconnect from impervious surfaces and allow water to infiltrate back into the groundwater supply.

IMPAIRED WATER QUALITY

The high level of impermeability also has implications for water quality. Stormwater flows across the paved surfaces throughout the project area, collecting a wide range of contaminants and transporting them to the ocean. Urban stormwater runoff is the leading source of ocean pollution in Southern California (City of Los Angeles Department of Public Works Bureau of Sanitation 2009), and streets and alleys are some of the most contaminated impermeable surfaces in the city. By utilizing filtration and infiltration design responses in these spaces, significant progress can be made in reducing levels of pollutants in stormwater.

IMPAIRED AIR QUALITY

Combined factors in the Los Angeles region – warm sunny weather, persistent high-pressure systems, surrounding mountains, and high volumes of traffic – have led to some of the highest concentrations of air pollutants in the nation (Cox et al. 2009). The AMP project area in particular is affected by two major freeways – Interstates 10 and 110 – which deliver high concentrations of pollutants. Researchers have found that during pre-sunrise hours, weather conditions lead to even higher levels of air pollution as far as 1.5 miles south of Interstate 10 (Anderson 2009).

URBAN HEAT ISLAND EFFECT

As of 2006, the City of Los Angeles' tree canopy cover was 21%, similar to Baltimore with 20% and New York City with 23%. However Council District 9, which extends into the majority of the project area, has the lowest coverage

FIGURE 5.3
A MOTHER AND HER CHILDREN ENJOY A DAYTIME STROLL

in the City, with seven to nine percent coverage (McPherson et al. 2007). The lack of tree canopy combined with the high percentage of impermeable surfaces leads to increased temperatures in the project area, with studies revealing more frequent and longer lasting heat waves in Southern California (Tamrazian et al. 2008).

LACK OF ACCESS TO OPEN SPACE AND RECREATION OPPORTUNITIES

The project area averages less than one-half-acre of parks for every 1,000 residents, a gross imbalance compared with the City of Los Angeles standard of a minimum of 3.6 acres per 1,000 residents (City of Los Angeles Department of Recreation and Parks 2009). With 216 acres of alleys versus 164 acres of existing parks in the project area, the total area of alleys is actually greater than the acreage of parks. This presents the opportunity to use alleys as new open space in an area that is often limited in undeveloped land that could be used for park development due to high population density.

HIGH LEVELS OF CRIME

Members of the community consistently expressed concerns over safety in their neighborhoods during the AMP outreach and input stage. These concerns are validated by the record of crime occurrences in the AMP project area neighborhoods. In the Los Angeles Times' crime rankings, six of the ten neighborhoods in the project area are within the fifty highest per capita crime rate ranking for property crime and nine out of ten are in the twenty-five highest per capita crime rate ranking for violent crime (Los Angeles Times 2011c, 2011d).

INSUFFICIENT PEDESTRIAN AND BICYCLE INFRASTRUCTURE

The AMP project area contains 8.9% of the City's total population in just 18 square miles, yet it has only three existing bicycle lanes. During multiple site visits, bicyclists were regularly observed throughout the project area, and in the first phase of outreach it became clear that youth in particular rely on bicycles for transportation. Additionally, most survey respondents reported walking in their neighborhoods on a daily basis, often multiple times per day. Strengthening the safety and comfort features for pedestrians and bicyclists would greatly improve the quality of life in the AMP project area.



FIGURE 5.4
PROJECT AREA ANALYSIS PROCESS DIAGRAM



5-C. PROJECT AREA OPPORTUNITIES

The alleys, streets, sidewalks, and vacant lots of South Los Angeles possess tremendous potential to catalyze improvements in the physical and social environments of South Los Angeles. The collection of small scale interventions throughout individual neighborhoods and the entire project area work together to disconnect impervious surfaces, and introduce shade, vegetation, and resources for the community. Opportunities exist in conditions that can facilitate the development, implementation, and/or long-term success of green alley network projects. Opportunities may also provide unique conditions to complement or support future green alley infrastructure. The categorized opportunities for the AMP project area are listed below.

STORMWATER CAPTURE + TREATMENT

- Rooftops and large paved areas (parking lots) provide additional stormwater capture opportunities.
- Stormwater runoff from streets may be treated through low impact development (LID) BMPs in adjacent alleys.
- Low volumes of traffic in alleys allow more options for stormwater BMPs.
- Areas without stormdrains are in greatest need for LID BMPs.
- Vacant lots provide potential for larger stormwater infiltration BMPs.

FIGURE 5.5
VACANT LOTS IN THE AMP PROJECT AREA PRESENT OPPORTUNITIES FOR OPEN SPACE

URBAN GREENING + COOLING

- Wide streets and open parkways provide space for plantings and trees.
- Back walls along alleys could support green walls.
- Large flat roofs may be suitable for green roofs and are an opportunity to further reduce stormwater flows.

USABLE OPEN SPACE

- A significant demand for open space necessitates parks and recreation solutions. Some surveys revealed a preference for parks as outdoor spaces.
- Phase one outreach surveys indicated many residents prefer the outdoor activities of walking and relaxing.
- Vacant lots could become pocket parks.
- Permits may allow alleys to function as flexible spaces.
- Urban agriculture can be conducted in small spaces, including vertically along walls.
- Some residents have already proposed the inclusion of recreation opportunities in green alleys.
- Children already use alleys as play spaces.

SAFE CONNECTIONS

- Outreach surveys revealed high levels of daily walking activity to a variety of neighborhood destinations.
- Alleys provide linkages between destinations in the community.
- Lower traffic volumes in alleys make them safer spaces for pedestrians and bicyclists.
- Some conditions may allow closing alleys to vehicular traffic.
- Alleys are currently used by residents as shortcuts.
- Increased use of alleys will increase their safety.
- Alleys that are highly visible from the street cue a safe connection to pedestrians and bicyclists.
- The City will provide additional lights in alleys (for a fee) at residents' request.
- Improving street and alley lighting has demonstrated results for reducing crime. Outreach surveys indicate lighting is a priority in the networks.
- Public transit stops provide connections beyond the network area, and generate pedestrian activity within the network.
- Vacant buildings offer an opportunity for new economic development.

MANAGEMENT + MAINTENANCE

- The interdepartmental Green Streets Committee facilitates green infrastructure implementation, management, and maintenance.
- Both phase one and phase two outreach surveys indicated many residents desire better maintenance of the alleys.
- Homeowners Associations or other neighborhood groups can share maintenance responsibilities and expenses.
- Multiple places of worship, schools, and other community organizations throughout the networks could potentially offer community partnerships and leadership.

Constraints limit effectiveness of future green alley network improvements, or inhibit development and implementation. The constraints for the project area are organized in categories related to green alley network functions and AMP objectives.

STORMWATER CAPTURE + TREATMENT

- Street overflow capacities must be maintained.
- Redirecting stormwater to a different engineered subwatershed may overstrain the built infrastructure.
- Large roof and parking lot surfaces may generate a higher volume of stormwater runoff than can be handled by LID BMPs in the space available.
- Infiltration BMPs should be located at least ten feet above the groundwater and away from any building foundation.
- Infiltration BMPs cannot be utilized in the vicinity of leaking underground storage tanks (LUSTs).

URBAN GREENING + COOLING

- Green roofs and green walls require the consent and cooperation of private property owners.
- Lack of street trees contributes to poor air quality and decreases pedestrian and cyclist comfort.
- Incentives such as grants, rebates, or tax reductions are not currently sufficient to support widespread adoption/implementation of urban greening and cooling interventions.

USABLE OPEN SPACE

- Residential land uses adjacent to alleys may preclude active recreation design responses that have associated increased noise levels.
- The long, narrow shape of alleys limits accommodation of recreation activities.
- High crime rates and the perception of danger inhibit people from using the alleys and other public open spaces.

SAFE CONNECTIONS

- Poor lighting in alleys negatively affects safety and perception of safety.
- The City does not typically provide more than one light per alley.
- Additional lighting may be provided in alleys, but residents may be responsible for the expense of installation and maintenance.
- High crime rates and the perception of danger inhibit people from using the alleys.
- Long alleys (approximately 600 feet or longer) and alleys with blind corners contribute to poor safety due to restricted visibility and a perceived sense of entrapment.
- Hazardous conditions in alleys (poor paving, illegal dumping) contribute to poor safety and decreased user comfort.
- Gating alleys has reduced illegal dumping and crime in some alleys, but the gates are now illegal.
- Legally, public access to alleys must be maintained.
- Alleys provide the only access to parking areas for some properties.
- Vehicles are often parked and sometimes abandoned in alleys, restricting access by others.
- Frequent vehicle use of alleys complicates the safe accommodation of pedestrian and bicycle elements, as well as other design responses.
- Vacant buildings create dead zones in commercial strips.

MANAGEMENT + MAINTENANCE

- Graffiti and tagging is prevalent.
- Poor maintenance has led to hazardous conditions in alleys (poor paving, illegal dumping).
- Funding for maintenance is extremely limited.
- Illegal dumping outpaces City clean-up efforts.
- City resources for clean-up efforts are limited.



FIGURE 5.6
GRAFFITI, DUMPING, AND STRAY DOGS DIMINISH THE PERCEPTION OF SAFETY



PRIORITY NETWORK



ANALYSIS + PLANNING



FIGURE 6.1
INVENTORIED CHARACTERISTICS
IN PRIORITY NETWORKS

6. PRIORITY NETWORK ANALYSIS + PLANNING

This large-scale study inventoried the conditions of the project area, and solicited input from the client, stakeholders, and community. Analysis of both sets of information resulted in the identification of six high-priority networks with the greatest potential for positively addressing the issues of stormwater runoff volume and quality, usable open space, and safe pedestrian and bicyclist connections. In addition, the issues, opportunities, and constraints of alley design and planning for the entire project area were identified, as were typologies of green alley network design responses applicable throughout the project area. However, this coarse scale of analysis could not specifically reveal the best design strategy for individual alley segments. In order to work toward that level of specificity, a finer analysis focused on the high-priority networks was conducted.

It should be noted that one of the six high-priority networks, Avalon, is a green alley demonstration project. Under the direction of The Trust for Public Land, Avalon has already been studied and analyzed, a series of community workshops and meetings have been held, and designs have been determined (see also Chapter 1, page 4). Given the advanced status of the project, it has not been included in the priority network analysis phase in this document.

For the other five high-priority networks, Western-MLK, Vermont Square, Quincy Jones, Central-Jefferson High, and Broadway-75th, the priority network analysis phase included mapping and recording specific conditions and characteristics within each network. The mapped conditions were then used to analyze the capability and suitability of the numerous alley segments, streets, and vacant lots within each of the networks. This analysis was based on the criteria of the various typology functions that support the AMP's goal and objectives. The priority network analysis also revealed the issues, opportunities, and constraints associated with each of the networks. For a description of broader issues, opportunities, and constraints affecting the entire project area, please refer to *Chapter 5: Project Area Analysis*.

An inventory of the high priority networks was conducted using finer-grain data on street and alley characteristics, open space and its use. In addition, the movement of people within the network was collected, mapped and analyzed to understand conditions within the network.

STREETS + ALLEYS

An inventory of street characteristics identified the existing conditions of streets and their relationship with the alleys in the network. Analysis of these conditions helped to visualize their potential role in the green alley network and identify the streetscape elements that should be prioritized and implemented. Similar to street characteristics, inventory and analysis of alley characteristics synthesized the opportunities and constraints of alleys in order to visualize and understand alleys in terms of their suitability (what should be implemented) and priority (what is most needed and/or provides the greatest benefit).

Identifying planned infrastructure improvements for streets and alleys ensured that the AMP did not make duplicative or unnecessary recommendations for those streets and alleys already slated for redevelopment. Planned infrastructure improvements within the project area indicate the future state of the transportation network. The AMP made mindful recommendations for the redevelopment of streets and alleys that account for anticipated circulation patterns in alignment with currently proposed infrastructure improvements.

Supplementing information from the project scale hydrology model, stormwater data were mapped at the finer network scale to analyze hydrological function and potential for stormwater capture and treatment. A sun/shade analysis prioritized alleys and streets for their ability to mitigate the urban heat island effect based on existing tree canopy and the position and height of adjacent buildings.

OPEN SPACE

Vacant lots are key opportunity sites for new uses and amenities, including new usable open space and stormwater BMPs. Mapping revealed the locations and relationships between alleys, streets, and vacant lots, which were then analyzed to determine their maximum potential benefits related to AMP objectives.

Abandoned buildings may also provide opportunities for future open space or other community developments. Data on abandoned buildings was limited and therefore not included in this document, but as green alley projects progress opportunities to integrate such properties may arise.

Neighborhood crime affects residents' perception of safety, and can become a barrier to the use of public open space. Mapping crime hotspots allowed the AMP to understand where crime prevention design responses should be a priority in order to decrease this barrier. Los Angeles Police Department data was utilized to identify the types and cross-street locations of reported crimes in the high-priority networks. Data was collected for a six month period in 2011, and locations that had three or more violent or property crimes were highlighted as crime hotspots.

CIRCULATION

Mapping public transit, bicycling, and walking connections ensured that the AMP connected to existing transportation infrastructure and completed missing links to meet residents' needs for local and regional travel. Community destinations were mapped to identify those locations most frequented by residents. These include, but are not limited to, schools, churches, grocery stores, and other local businesses.

The potential to utilize alleys for providing equestrian trails was considered for the AMP. However, as there are not existing equestrian facilities or trail networks within the project area, the AMP does not propose this function.

Vehicle collisions (including those involving pedestrians and cyclists) are a threat to public safety. The perception of dangerous conditions resulting from multiple collisions in an area can deter residents from walking and bicycling. Collision hotspots were mapped to identify where design responses should prioritize pedestrian and bicyclist safety. Utilizing data from the California Statewide Integrated Traffic Records System from a two year period (2008-2009) the locations of collisions in the high-priority networks were identified. Locations that had three or more collisions involving vehicles, motorcyclists, bicyclists, and/or pedestrians were mapped as collision hotspots.

Alleys that are currently not accessed by vehicles were identified as they are ideal opportunities for decommissioning and redevelopment into open/recreational space, and/or habitat. Also identified were alleys providing access to parking. Since they must accommodate vehicle traffic, features that can be implemented are limited and the redevelopment of these alleys is constrained.

Many of the above topics include a more specific sub-set of data. For example, in the stormwater category, stormwater capture opportunities (including parking lots and rooftops), direction of surface flow, location of drain inlets, building footprints, vacant lots, and leaking underground storage tank (LUST) sites were identified and allowed the AMP to pinpoint the locations best suited for alley/street BMPs.





STORMWATER CAPTURE + TREATMENT



URBAN GREENING + COOLING



USABLE OPEN SPACE + POTENTIAL DEVELOPMENT



SAFE CONNECTIONS

FIGURE 6.2 (LEFT)
AN ALLEY IN VERMONT-SLAUSON NEIGHBORHOOD

FIGURE 6.3 (ABOVE)
CATEGORIES OF ALLEY TYPOLOGIES USED IN NETWORK SELECTION AND ANALYSIS

6-B. PRIORITY NETWORK PROFILES + ANALYSIS

Based on the network's conditions and alleys' context, priorities for the alleys were identified and an examination of how individual alleys, streets, and vacant lots could work together, acting as a network rather than as a collection of separate segments, to serve the project objectives was established.

All of the high-priority networks provide opportunities for addressing stormwater quantity and quality, open space, and community connections. However, each network encompasses unique conditions that prioritize a particular objective. To this end, the alleys in each network were analyzed for their suitability to support four proposed functions that help to achieve the project objectives. These four functions are used to classify the alleys into four typologies:

- Stormwater Capture + Treatment: ability of alleys and streets to support stormwater BMPs that capture, convey, filter, and/or infiltrate stormwater.
- Urban Greening + Cooling: ability of alleys and streets to support increased vegetation and BMPs that cool the urban environment and mitigate poor air quality.
- Usable Open Space + Potential Development: ability of alleys and streets to provide safe open space and recreation opportunities, such as native habitat, pocket parks, or urban agriculture, and can be closed to vehicular traffic.
- Safe Connections: ability of alleys and streets to provide routes that safely prioritize pedestrians and bicyclists and link key community destinations.

Table 6.5 includes the network inventory conditions that were analyzed to determine the suitability of the alley network to perform each of the four functions associated with the typologies described above. In the table, a "+" sign in the "Yes" column indicates that the presence of that condition contributes to the site's suitability for the function. A "-" sign in the "Yes" column indicates that the presence of that condition either hinders or prevents the site's suitability for the function. For the "No" column, a "+" sign indicates that the absence of that condition contributes to the site's suitability for the function, and a "-" sign indicates that the absence of that condition hinders or prevents the site's suitability for that function (Table 6.4). An "o" indicates that the presence or absence of the condition has a neutral effect, or is not applicable.

Profiles and analyses for each of the high-priority networks include a summary of the network's defining characteristics and an analysis of typology suitability and priority, as well as their issues, opportunities, and constraints.

Stormwater Capture + Treatment		
CONDITION	YES	NO
Presence of downstream drain inlet to serve as an overflow device	+	-
Alley or street location within the engineered watershed that allows for the capture and treatment of stormwater from surrounding streets and hardscape	+	-
Opportunity to redirect runoff to vacant lot to support larger scale BMPs	+	O
Presence of leaking underground storage tanks (LUSTs)	-	+
Urban Greening + Cooling		
CONDITION	YES	NO
Gaps in the existing tree canopy	+	-
Alley-adjacent and extensive areas of hardscape	+	-
Alley surface material: overgrown vegetation	-	+
Alley surface material: unpaved	-	+
Alley surface material: broken pavement	+	O
Alley surface material: concrete	++[*]	O
Alley surface material: asphalt	+++	O
Usable Open Space		
CONDITION	YES	NO
Alleys wider than average (>15')	+	O
Ability to restrict vehicular traffic [**]	+	-
Clear visibility into and within alley[***]	+	-
Safe Connections		
CONDITION	YES	NO
Direct connection to community destination, bike lane, or transit stop	+	-
Repeated occurrence of collisions on network streets	+	-
Alley or street position as a link within a route	+	-

KEY	YES	NO
+	Presence of condition contributes to suitability	Absence of condition contributes to suitability
-	Presence of condition hinders	Absence of condition hinders

[*] "++" and "+++" indicate a continuum: concrete exhibits a greater need for urban greening and cooling than broken pavement, and asphalt exhibits the greatest need for urban and greening of all the alley surface materials.

[**] Vehicle traffic within alleys was analyzed along a continuum: High=provides access to a parking lot, Moderate-High=commercial adjacent, Moderate=provides only access to residential parking, Low-Moderate=provides additional access to front-accessed residential parking, and Low=overgrown alleys.

[***] Visibility within alleys was analyzed along a continuum based on alley configuration, from best visibility to worst: short and open-ended alleys, long and open-ended alleys, T-shaped alleys, H-shaped alleys, and dead-end alleys.

TABLE 6.4 (ABOVE)
SUITABILITY ANALYSIS TABLE KEY

TABLE 6.5
SUITABILITY ANALYSIS TABLE

CENTRAL-JEFFERSON HIGH NETWORK PROFILE + ANALYSIS

Central-Jefferson High Network is located in the eastern portion of the project area, along Central Avenue, and contains South Los Angeles' historic jazz district (Figure 6.6). Network alleys are parallel to the Central Avenue commercial corridor, and link two elementary schools, a charter school, and Jefferson High School; as well as the Central Avenue Jazz Park, historic Dunbar Hotel, and Council District 9 Constituent Services Center.

Approximate Area: 100 acres

RATIONALE FOR SELECTION

Central-Jefferson High Network has the highest combined score for the project area runoff volume, pollution levels, park poverty, and community connections models used for network selection (discussed in Chapter 4, Network Selection). Green alley initiatives have already begun in the neighborhood through academic projects by Jefferson High School and UCLA Extension's Landscape Architecture program.

FIGURE 6.6
CENTRAL-JEFFERSON HIGH NETWORK



Church
Bus Stop
Alley Gates
Open
Closed
Alley Width 15'
Alley
Network Boundary
Existing Tree Canopy



FIGURE 6.7
HISTORIC DUNBAR HOTEL ON CENTRAL AVENUE



FIGURE 6.8
STREET ACTIVITY ALONG CENTRAL AVENUE

CENTRAL-JEFFERSON HIGH STORMWATER CAPTURE + TREATMENT ANALYSIS

STORMWATER CAPTURE + TREATMENT OPPORTUNITIES

Six alley-adjacent vacant lots provide greater opportunities for stormwater capture.

Gaps in the urban forest provide opportunities for tree plantings along all streets for capturing and absorbing rainwater.

Commercial adjacent alleys east and west of Central Avenue provide opportunities to capture and treat stormwater runoff from parking lots and large roofs.

Wide streets provide ample space for parkway stormwater capture and treatment BMPs; wide streets include Central Avenue, Naomi Avenue south of 41st Street, Zamora Street south of 41st Street, Hooper Avenue south of 41st Street, Martin Luther King Jr. Boulevard, 40th Place, 41st Street, 42nd Place, 43rd Street, and 43rd Place.

FIGURE 6.9
CENTRAL-JEFFERSON HIGH STORMWATER CAPTURE + TREATMENT ANALYSIS



Nine 20-foot-wide alleys provide space for vehicle traffic in combination with stormwater BMPs.

The current stormwater flow pattern and drain inlet locations around Central Avenue Jazz Park and the vacant lot located on Central Avenue between 40th Place and 41st Street provide the potential to redirect stormwater runoff into BMPs for infiltration.

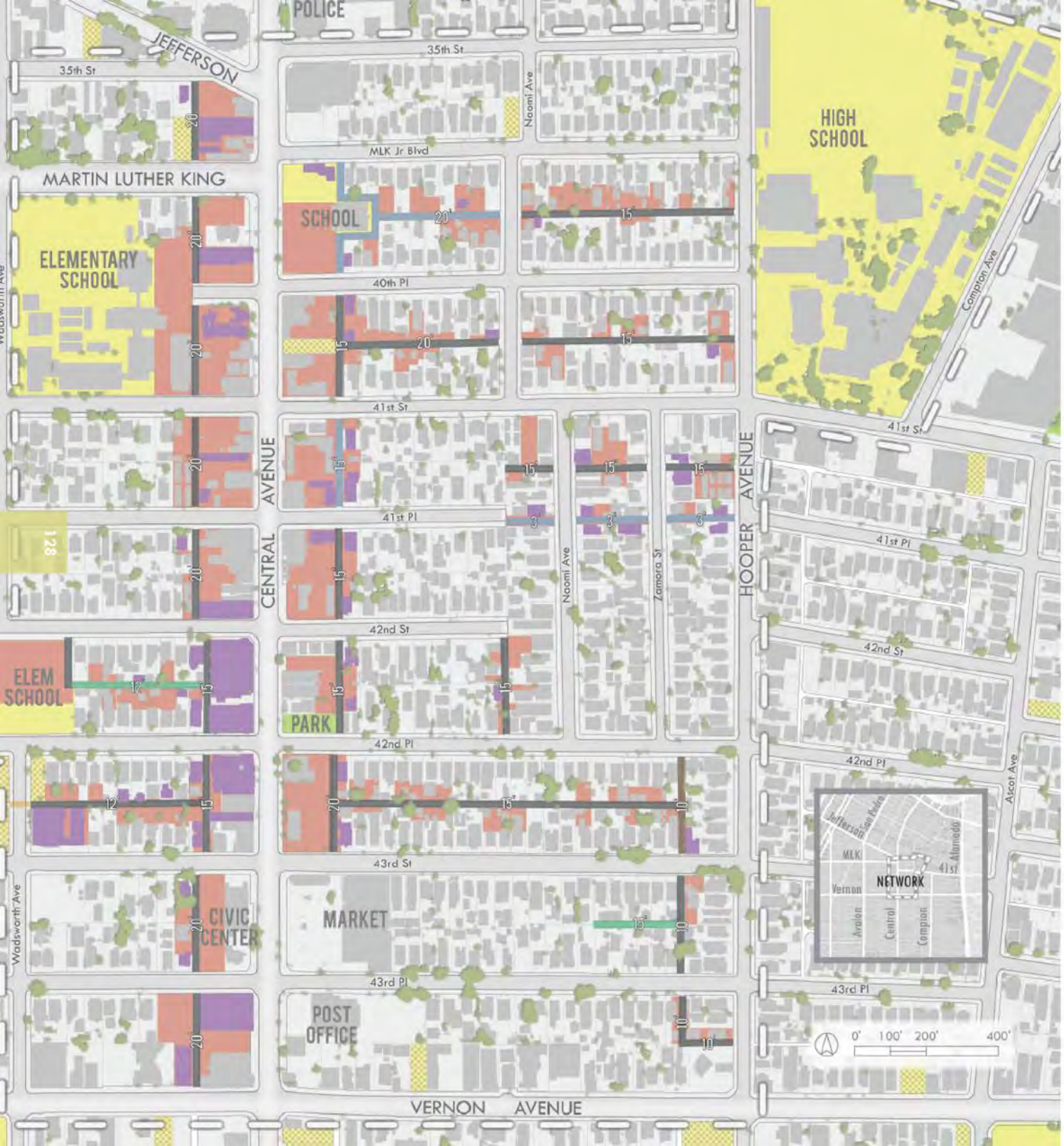
STORMWATER CAPTURE + TREATMENT CONSTRAINTS

High traffic volume and planned bike lanes along Central Avenue and Martin Luther King Jr. Boulevard constrain the availability of space in which stormwater BMPs can be installed to handle a higher volume of runoff from large roof and parking lot surfaces, especially along Central Avenue's commercial corridor.

Two 12-foot-wide alleys and three 10-foot-wide alleys constrain the space available for stormwater BMPs.



FIGURE 6.10
POOR DRAINAGE IN AN ALLEY IN THE AMP PROJECT AREA



CENTRAL-JEFFERSON HIGH URBAN GREENING + COOLING ANALYSIS

URBAN GREENING + COOLING OPPORTUNITIES

Gaps in the urban forest provide opportunities for tree plantings along streets to alleviate the urban heat island effect. A lack of tree canopy indicates higher levels of heat due to more sun, and less shade and evaporative cooling.

The majority of the alleys in Central-Jefferson High Network are paved with asphalt, providing opportunities for redevelopment with high albedo pavement.

Alleys adjacent to several tall buildings within the network provide opportunities for using green walls to mitigate the heat that is released from the building walls. Alleys located on the south or west sides of tall buildings are not shaded by the buildings in the afternoon, and are subject to the heat that is released back from those walls.

Alleys that are exposed on the west or south, due to vacant lots or parking lots,

FIGURE 6.11
CENTRAL-JEFFERSON HIGH
URBAN GREENING + COOLING ANALYSIS

receive high levels of afternoon sun. These alleys could benefit from structures, canopies, trees, or other measures to provide shade and a cooler environment.

Commercial areas along Central Avenue and all three schools have large areas of pavement and are opportunities for greening.

One dead end alley west of Hooper Avenue between 43rd Street and 43rd Place provides suitable conditions for prioritizing urban greening and cooling.

Alleys that are 15 to 20 feet wide provide space for additional design responses, such as green walls or vegetated swales.

URBAN GREENING + COOLING CONSTRAINT

Consent and cooperation of private and public property owners is required to install green roofs on buildings, in particular at all three schools and large buildings along the Central Avenue commercial corridor.

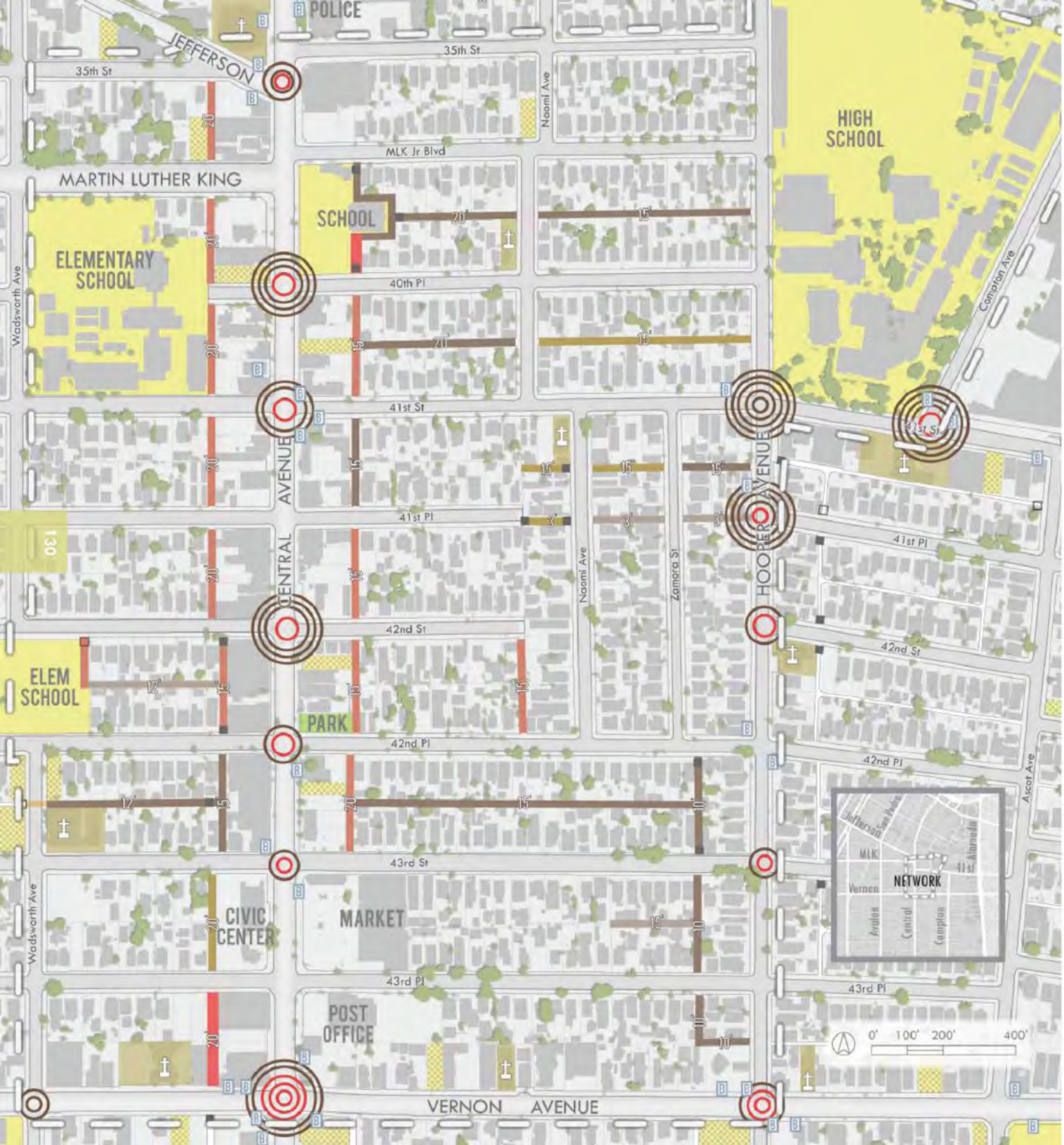
Limited data was available concerning plans for future street tree plantings.





FIGURE 6.12 (TOP)
WIDE STREET WITHOUT CANOPY TREES

FIGURE 6.13 (BOTTOM)
WIDE ASPHALT ALLEY



CENTRAL-JEFFERSON HIGH USABLE OPEN SPACE + POTENTIAL DEVELOPMENT ANALYSIS

USABLE OPEN SPACE + POTENTIAL DEVELOPMENT OPPORTUNITIES

Events such as festivals and carnivals were repeatedly listed in preliminary community outreach as activities that bring the community together. This indicates a need for open space that can accommodate such activities.

Fourteen commercial-adjacent alleys provide opportunities to establish flexible spaces for commercial or community activities, such as outdoor dining, markets, and festivals.

One overgrown alley west of Central Avenue between 42nd Street and 42nd Place has the potential to be closed completely to automobiles and decommissioned.

Nine vacant lots provide excellent opportunities for pocket parks or other open space interventions.

FIGURE 6.14
CENTRAL-JEFFERSON HIGH
USABLE OPEN SPACE ANALYSIS

Alley Traffic
High
Mod. High
Moderate
Mod. Low
Low
Vacant Lot
Church
Bus Stop
Existing Tree Canopy

Crime Reports
Violent Crime
Property Crime
note: multiple rings indicate more crime incidents
Alley Width
Network Boundary

The vacant lot located on Central Avenue between 40th Place and 41st Street provides an opportunity for the creation of open space that is directly linked to Jefferson High School via an alley connection.

Three 3-foot-wide pedestrian alleys provide suitable conditions for small-scale open space responses (for example, hopscotch).

USABLE OPEN SPACE + POTENTIAL DEVELOPMENT CONSTRAINTS

Homeless people use some of the alleys for shelter. Sensitivity should be exercised to address the needs of both the homeless and neighborhood residents when redeveloping alleys to be open space.

Two alleys of high-volume traffic and twelve alleys of moderate-high volume traffic constrain the design responses that can be considered in the redevelopment of alleys as usable open spaces.

Crime hotspots near Jefferson High School and along Central Avenue foster perceptions of danger and inhibit the use of alleys and other public open spaces.

Central Avenue Jazz Park is currently a known area of gang activity, discouraging use of the park and surrounding open space by the wider public.

A unique Y-shaped alley in the block bordered by Martin Luther King Jr. Boulevard, Naomi Avenue, 40th Place, and Central Avenue has poor visibility and may lead to a sense of entrapment.

No planned community development projects, new parks, or abandoned buildings were identified within this network, however as time progresses such opportunities may arise.





FIGURE 6.15 (TOP)
CENTRAL AVENUE JAZZ PARK

FIGURE 6.16 (BOTTOM)
CLOSED AUTO SHOP ON CENTRAL AVENUE REMAINS VACANT

CENTRAL-JEFFERSON HIGH SAFE CONNECTIONS ANALYSIS

SAFE CONNECTIONS OPPORTUNITIES

Gaps in the urban forest provide opportunities for tree plantings along all streets to provide shade and increase pedestrian and bicyclist comfort.

Destinations within the network include one high school, two elementary schools, one charter school, five churches, and numerous stores providing local services.

The majority of the alleys within the network have high visibility, providing ideal conditions for encouraging walking and bicycling.

Orientation and position of alleys allow for direct linkages between Jefferson High School, the Central Avenue commercial corridor, the existing bike lane along Martin Luther King Jr. Boulevard west of Central Avenue, the proposed bike lane along Central Avenue, and bus stops at Central Avenue and Vernon Avenue.

FIGURE 6.17
CENTRAL-JEFFERSON HIGH
SAFE CONNECTIONS ANALYSIS



Bike lanes on Central Avenue and Martin Luther King Jr. Boulevard and bus stops along Central Avenue, Hooper Avenue, and Vernon Avenue provide opportunities for connecting residents to the regional transportation network.

High school students from Jefferson High School tended to use 41st Street, Central Avenue south of 41st Street, Hooper Avenue south of 41st Street, and Vernon Avenue on their way to and from school, providing opportunities for alleys to provide safer and shorter connections.

Collision hotspots near Jefferson High School and along Central Avenue are opportunities for street and intersection enhancements.

As part of Safe Routes to School, the network has a flashing crossing light at the intersection of Central Avenue and 42nd Place.

SAFE CONNECTIONS CONSTRAINTS

Central Avenue Jazz Park is currently a known area of gang activity, discouraging the use of the alleys within close proximity of the park as connections.

Two alleys with moderate-low visibility constrain the design responses that can be considered in the redevelopment of alleys as safe connections.

Collision hotspots near Jefferson High School and along Central Avenue foster perceptions of danger and inhibit the use of alleys and streets as connections.

CENTRAL-JEFFERSON HIGH ISSUES

While all of the issues identified for the project area are relevant to some extent for each network, some issues emerge as being particularly important to address. The primary issues affecting Central Jefferson-High Network include:

Degenerated hydrologic function and impaired water quality.

- Runoff volume is predicted to be between 0.13-0.24 feet^3/second /acre, which is considered medium-high levels; zinc and oil and grease levels are also predicted to be above the recommended threshold. The capture and treatment of stormwater runoff within Central-Jefferson High Network is a priority because of the high potential to address the high impermeability, reported cases of flooding, and pollutant levels over the recommended threshold found within this network.

Lack of access to open space and recreation opportunities.

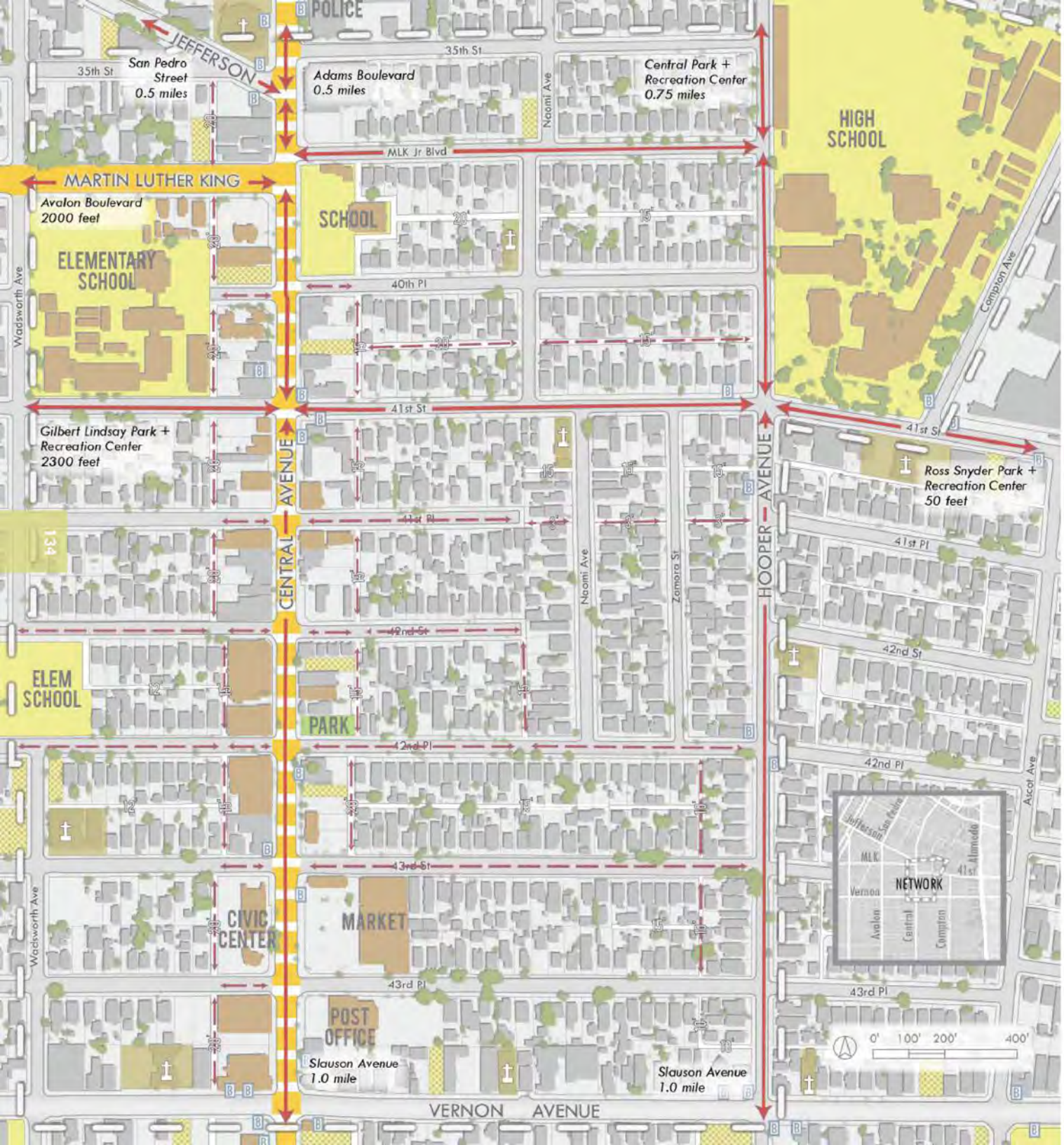
- The Central-Jefferson High Network has a very high population density and the open spaces and recreational opportunities currently available in the network are inadequate to meet the needs of the community. Furthermore, the network has medium-low crime rates but a level of perceived danger is present, acting as a barrier to the use of open spaces. The selection of appropriate sites for creating usable open spaces and recreational opportunities should prioritize alley design for crime prevention to improve residents' perceived and actual sense of safety.

Insufficient pedestrian and bicycle infrastructure.

- The combination of high traffic volumes along Central Avenue and the lack of safe crossings act as barriers to walking and biking. This prohibits the major streets within the network from fully functioning with the minor residential streets and alleys as a complete network. The anticipated circulation map (Figure 6.19) shows existing pedestrian and bicycle routes and those identified by the community as desirable.



FIGURE 6.18
BUS STOP ON CENTRAL AVENUE



CENTRAL-JEFFERSON HIGH SUITABILITIES + PRIORITIES

The inventory and analysis of each network allows the AMP to recommend priorities that each of the alley segments will address. Additionally, based on the locations of key community resources and existing pedestrian and bicycle infrastructure, the AMP predicts how improvements to alleys, intersections, and bike lanes will impact circulation within the network.

Central-Jefferson High Network parallels Central Avenue through the historic jazz district, and extends out to the west and east to multiple schools. The AMP's anticipated circulation analysis for the network (Figure 6.19) predicts north-south alleys as potential alternate routes to Central Avenue, with a few key east-west alleys that will serve as pedestrian routes between Central Avenue and Jefferson High School. New bike lanes and improved safety at intersections and other street enhancements will provide safe routes for bicyclists along Central Avenue and 41st Street.

FIGURE 6.19
CENTRAL-JEFFERSON HIGH
ANTICIPATED CIRCULATION ANALYSIS

Site visits and community outreach revealed high volumes of pedestrian and bicycle traffic in the Central-Jefferson High Network. Combined with high numbers of collisions at multiple intersections throughout the network, addressing insufficient pedestrian and bicycle infrastructure is one of the primary issues for this network. Alleys that extend behind the commercial and multi-family residential buildings along Central Avenue should prioritize safe connections design responses. Existing pedestrian alleys that extend east from 41st Place to Hooper Avenue as well as two alley segments that extend east-west between Central and Hooper Avenues will provide safe connections to Jefferson High School. Students at Jefferson High School have already been involved with some green alley design development, and the AMP supports their continued contribution to this project.

Central-Jefferson High Network contains multiple vacant lots throughout; these lots should be utilized to increase open space and recreation in this neighborhood, and can also contribute to stormwater capture and treatment and urban greening and cooling. Several alleys in the network are suitable for usable open space responses, and those that are not well-positioned to provide connections should be further analyzed for the potential to restrict vehicular traffic.

The commercial corridor along Central Avenue has high predicted runoff volume and predicted levels of pollutants above the recommended thresholds. Therefore, another key priority for Central-Jefferson High Network is the implementation of stormwater BMPs to maximize capture and treatment of stormwater runoff from the streets and other impermeable surfaces. The configuration of the alleys in combination with existing stormwater infrastructure leads to many alleys not being suitable for the capture and treatment of stormwater runoff from the surrounding streets. In these areas, BMPs should be placed in the curbside parkways. Naomi Avenue and Zamora Street, between 41st Street and 42nd Place, particularly have the potential to treat high volumes of stormwater runoff, as do the long east-west blocks between Central and Hooper Avenues. Stormwater capture and treatment BMPs are suitable for the north-south alley segments to the east of Central Avenue.





FIGURE 6.20 (TOP)
LACK OF BICYCLE INFRASTRUCTURE ON CENTRAL AVENUE

FIGURE 6.21(BOTTOM)
MURAL IN CENTRAL-JEFFERSON HIGH NETWORK



WESTERN-MLK NETWORK PROFILE + ANALYSIS

Western-MLK Network is located in the northwestern portion of the project area, between Exposition and Martin Luther King Jr. (MLK) Boulevards, intersected by Western Avenue (Figure 6.22).

Approximate Area: 250 acres

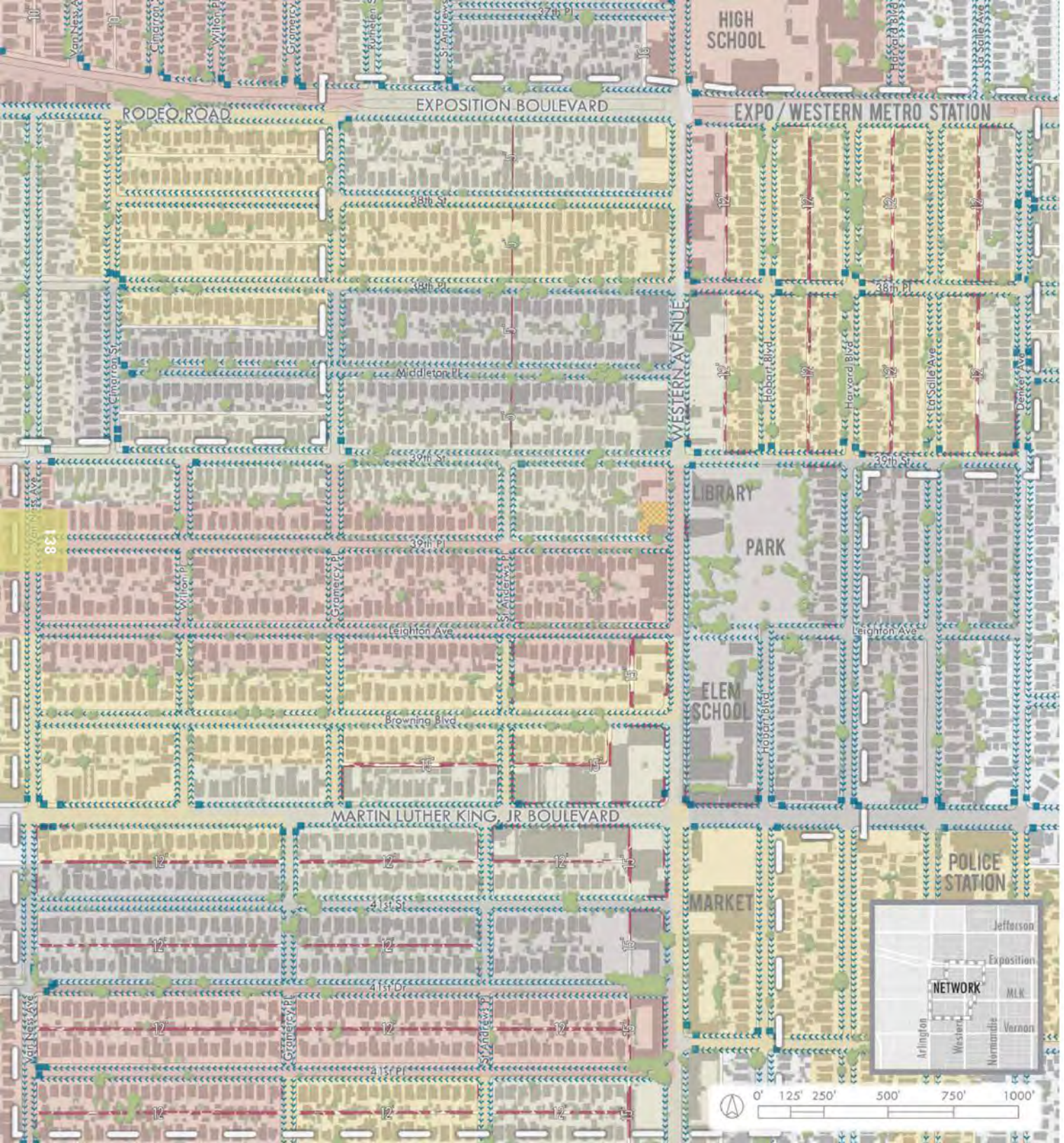
RATIONALE FOR SELECTION

Despite relatively low scores in the predictive hydrology models, which were based on the coarse-grain data of the project area (discussed in Chapter 4), the finer scale network inventory revealed a number of parking lots and large roofs adjacent to the alleys that provide opportunities to capture stormwater. Additionally, there are areas in the network where BMPs could alleviate the dearth of drain inlets within the residential matrix. Furthermore, a green alley network can build upon the planned pedestrian infrastructure improvements along Western Avenue, from Exposition Boulevard to MLK Boulevard.

FIGURE 6.22
WESTERN-MLK NETWORK

FIGURE 6.23 (OPPOSITE)
INFORMAL SHOE SALES IN WESTERN-MLK NETWORK

Church
Bus Stop
Alley Gates
Open
Closed
Alley Width
Alley
Network Boundary
Existing Tree Canopy



WESTERN-MLK STORMWATER CAPTURE + TREATMENT ANALYSIS

STORMWATER CAPTURE + TREATMENT OPPORTUNITIES

Stormwater BMPs in the network development could be coordinated with the proposed Metropolitan Transit Authority (MTA) park-and-ride lot on the southeast corner of Western and Exposition.

Stormwater BMPs in the network development could be coordinated with the proposed Ralph's grocery store renovation at Western Avenue and MLK Boulevard.

Gaps in the urban forest provide opportunities for street tree plantings to capture and absorb rainwater.

Alleys adjacent to commercial development along Western Avenue south of Exposition Boulevard provide opportunities to capture and treat parking lot and large roof stormwater runoff.

FIGURE 6.24
WESTERN-MLK STORMWATER CAPTURE + TREATMENT ANALYSIS

Wide residential streets provide ample space for parkway stormwater capture and treatment BMPs; wide streets identified for BMPs include those located in the northeastern corner of the network.

The current stormwater flow pattern and drain inlet locations around the park located on Western Avenue, between 30th Street and Leighton Avenue, provide the potential to redirect runoff for infiltration.

Alleys within the network that are 15 feet wide provide space for vehicle traffic in combination with stormwater BMPs.

The repetitive pattern of alleys and streets increases replicability and cost-efficiency of BMP implementation.

STORMWATER CAPTURE + TREATMENT CONSTRAINTS

There is only one vacant lot within Western-MLK Network. In the long-term, priority occupied lots may be considered for integrating larger-scale stormwater BMPs.

High traffic volume and a planned bike route along Exposition Boulevard and Western Avenue constrain the availability of space in which stormwater BMPs can be installed to handle a higher volume of runoff from large roof and parking lot surfaces, especially along Western Avenue's commercial areas.

No alleys within the network are greater than 15 feet wide and the majority are 12 feet wide, constraining the space available for BMPs.

Three five-foot-wide alleys preclude stormwater infiltration BMPs from being implemented in them.





FIGURE 6.25 (TOP)
WESTERN-MLK ALLEY WITH REPORTED FLOODING

FIGURE 6.26 (BOTTOM)
WESTERN-MLK ALLEY THAT DRAINS TO THE STREET

WESTERN-MLK URBAN GREENING + COOLING ANALYSIS

URBAN GREENING + COOLING OPPORTUNITIES

Gaps in the urban forest and wide residential streets and parkways provide opportunities for street tree plantings to alleviate the urban heat island effect, in addition to strengthening and diversifying the urban forest. A lack of tree canopy indicates higher levels of heat due to more sun, and less shade and evaporative cooling.

Shade trees or other urban greening and cooling responses associated with the network development can be coordinated with the proposed Metropolitan Transit Authority (MTA) park-and-ride lot on the southeast corner of Western and Exposition.

Shade trees or other urban greening and cooling responses associated with the network developments can be coordinated with the proposed Ralph's supermarket renovation at Western Avenue and MLK Boulevard.

The majority of the alleys in Western-MLK Network are paved with asphalt, providing opportunities for redeveloping with high albedo pavement.

FIGURE 6.27
WESTERN-MLK URBAN GREENING + COOLING ANALYSIS



Alleys adjacent to several tall buildings within the network provide opportunities for using green walls to mitigate the heat that is released from the building walls. Alleys located on the south or west sides of tall buildings are not shaded by the buildings in the afternoon, and are subject to the heat that is released back from those walls.

Alleys that are exposed on the west or south, due to vacant lots or parking lots, receive high levels of afternoon sun. These alleys could benefit from structures, canopies, trees, or other measures to provide shade and a cooler environment.

Commercial areas along Western Avenue and MLK Boulevard exhibit high amounts of pavement, providing opportunities for increasing vegetation in areas that are highly impermeable and have low albedo surfaces.

Alleys within the network that are 15 feet wide provide space for additional design responses like green walls or vegetated swales.

URBAN GREENING + COOLING CONSTRAINTS

Consent and cooperation of private/public property owners is required to install green roofs on buildings, in particular the Foshay Learning Center and MLK Jr. Elementary School.

Limited data was available concerning plans for future street tree plantings.

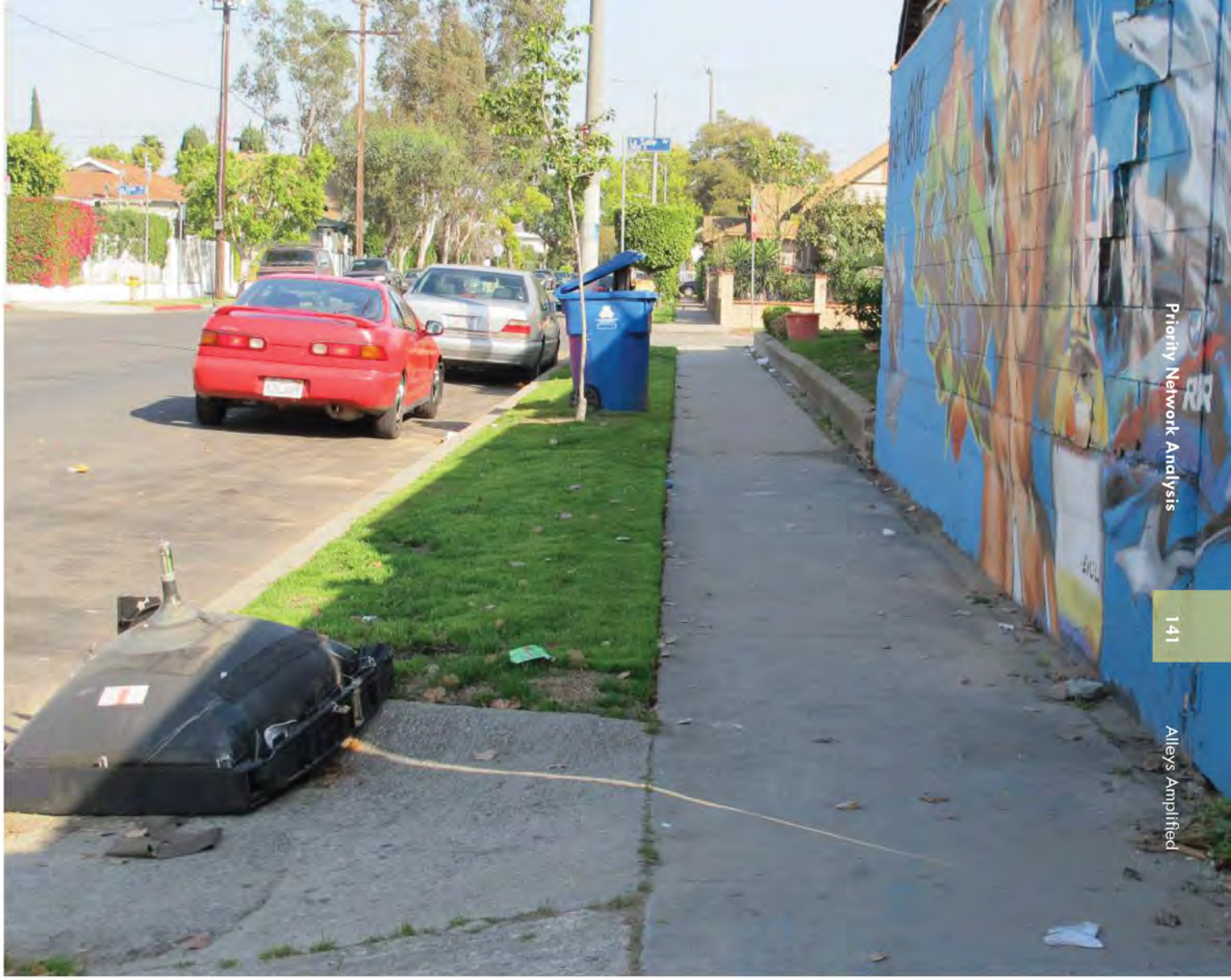




FIGURE 6.28 (TOP)
WIDE RESIDENTIAL PARKWAYS IN WESTERN-MLK NEIGHBORHOOD

FIGURE 6.29 (BOTTOM)
PARKING LOT ADJACENT TO AN ALLEY

WESTERN-MLK USABLE OPEN SPACE + POTENTIAL DEVELOPMENT ANALYSIS

USABLE OPEN SPACE + POTENTIAL DEVELOPMENT OPPORTUNITIES

Well-maintained artwork exists along some streets and alleys, increasing the interest and attractiveness of these open spaces.

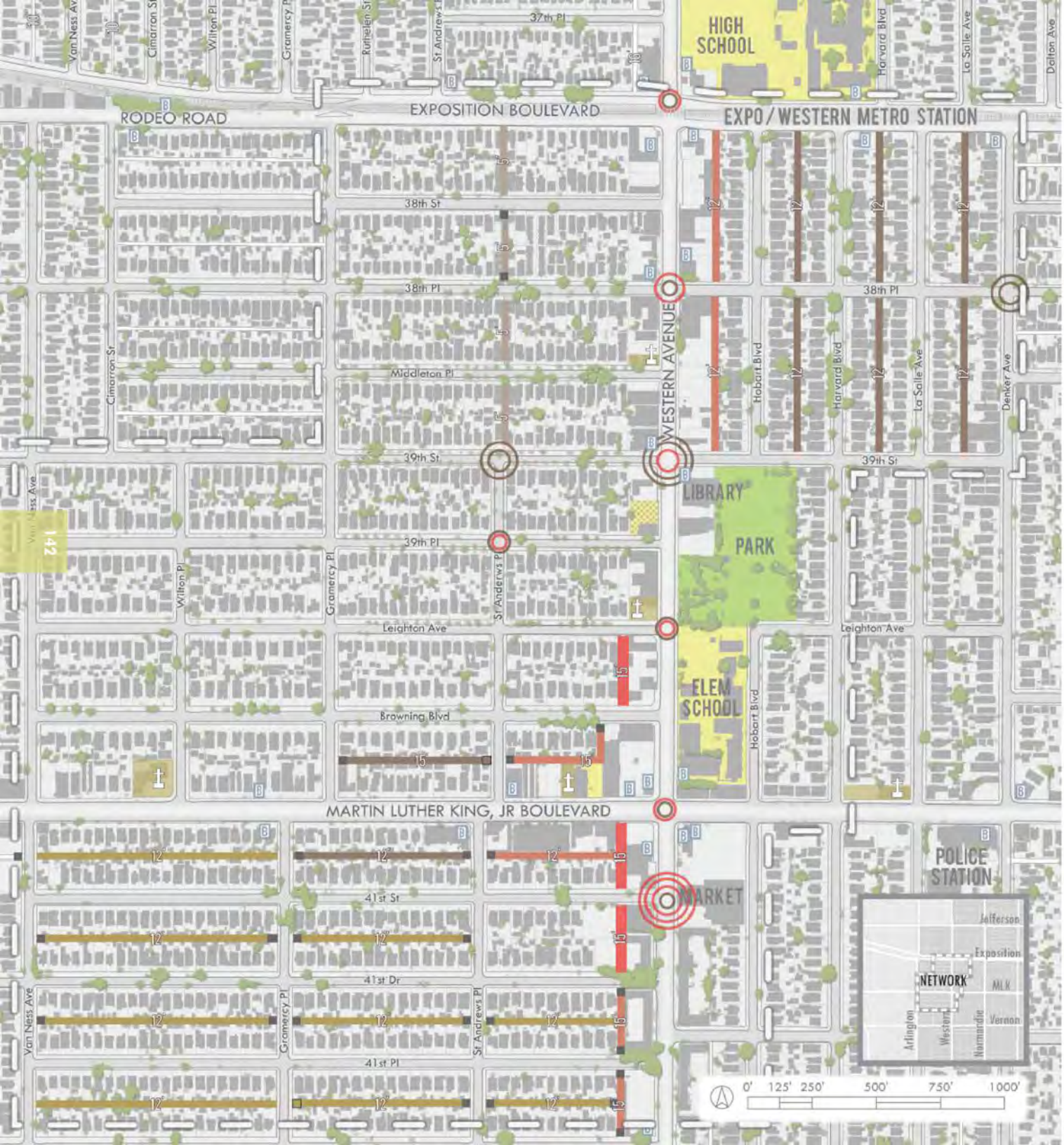
Events such as festivals and carnivals were repeatedly listed in surveys as activities that bring the community together, indicating a need for open space that can accommodate such activities.

A high percentage of homes with street-accessed driveways allow alleys to be used as flexible spaces, and potentially to be decommissioned.

Gated alleys in the southwest area of the network already restrict vehicular traffic, and may have the potential to be closed completely to vehicles.

Nine commercial adjacent alleys provide opportunities to establish flexible spaces for commercial activities, such as outdoor dining, markets, and festivals.

FIGURE 6.30
WESTERN-MLK USABLE OPEN SPACE ANALYSIS



USABLE OPEN SPACE + POTENTIAL DEVELOPMENT CONSTRAINTS

Homeless people use some of the alleys for shelter, which discourages residents from using the alleys. Sensitivity should be exercised to address the needs of both the homeless and the neighborhood residents when redeveloping alleys to be usable open spaces.

Reported flooding in alleys between Western Avenue and Hobart Boulevard constrains the usability of these alleys as open spaces in their current condition.

Three alleys of high volume traffic and six alleys of moderate-high volume traffic constrain the design responses that can be considered in the redevelopment of these alleys as usable open spaces.

Crime hotspots foster perceptions of danger and inhibit the use of alleys and other public open space.

Although there is one vacant lot within the network area, the lot is currently being used for parking by the adjacent health clinic. In the long-term, priority occupied lots may be considered for redevelopment as open space.

Alley gates currently act as barriers to accessing alleys; redeveloping alleys to be publicly accessible will require outreach and cooperation from residents.

Seven overgrown alleys have the potential to be decommissioned and closed completely to vehicles, as they are currently not used for vehicle traffic.

No new parks and open space projects or abandoned buildings were identified within this network, however as time progresses such opportunities may arise.





FIGURE 6.31 (TOP)
GATED AND OVERGROWN ALLEY

FIGURE 6.32 (BOTTOM)
ALLEYS LINK TO BIKE LANE AND METRO STATION

WESTERN-MLK
SAFE CONNECTIONS ANALYSIS

SAFE CONNECTIONS OPPORTUNITIES

Well-maintained artwork exists along some streets and alleys, increasing the interest and attractiveness of these spaces as pedestrian or bicyclist routes.

Wide residential streets provide ample space to safely accommodate motorists, bicyclists, and pedestrians.

There is strong connectivity between the new Expo Metro line, Martin Luther King Jr. Park, the library, schools, and fresh food outlets.

Gaps in the urban forest provide opportunities for tree plantings along all streets, which would provide shade and increase pedestrian and bicyclist comfort.

Connections within the network include a station stop for the new Metro Expo line; Class II bicycle lanes; the Foshay Learning Center; Martin Luther King Jr. Park, Library and Elementary School; several

FIGURE 6.33
WESTERN-MLK
SAFE CONNECTIONS ANALYSIS



charter and pre-schools; and a major grocery store.

The majority of the alleys within the network have high visibility, providing ideal conditions for encouraging walking and bicycling.

Orientation and position of alleys allows for direct linkages between the Expo station and Martin Luther King Jr. Park and Library. Additionally, two segments northwest of the intersection of Western Avenue and MLK Boulevard are currently being used by charter school students who walk between buildings owned and operated by the school.

Proposed bike lanes on Western Avenue and bus stops along Exposition Boulevard, Western Avenue, and MLK Boulevard provide opportunities for connecting residents to the regional transportation network.

Collision hotspots along Western Avenue are opportunities for targeting street and intersection enhancements.

The network contains an elementary school and a library, which serve as anchors for the network as well as providing educational and stewardship opportunities.

A predominately consistent pattern of streets and alleys facilitates wayfinding.

As part of Safe Routes to School, the network has one crossing guard before and after daily school sessions at the intersection of MLK Boulevard and Hobart Boulevard.

SAFE CONNECTIONS CONSTRAINTS

High-velocity traffic and reported collisions along Western Avenue, Exposition Boulevard, and MLK Boulevard negatively impacts pedestrian and bicyclist safety and perception of safety.

Overgrown alleys in the southwest portion of the network do not currently allow pedestrian and bicyclist passage.

Reported flooding in alleys between Western Avenue and Hobart Boulevard inhibits safe and comfortable pedestrian and bicyclist passage.

Nineteen 12 foot wide alleys restrict the accommodation of multiple user groups and some design responses, especially in combination. This constrains the ability to implement shared-use principles.

Alleys between high activity commercial areas and low activity residential areas require appropriate transitioning.

Martin Luther King Jr. Park on Western Avenue creates dead end alleys that break the connectivity of the network.

Alley gates currently act as barriers to accessing alleys; redeveloping alleys to be publicly accessible will require outreach and cooperation from residents.

WESTERN-MLK NETWORK ISSUES

While all of the issues identified for the project area are relevant to some extent for each network, some issues stand out as being particularly important to address. The primary issues affecting Western-MLK Network include:

Insufficient Pedestrian and Bicycle Infrastructure.

- Every intersection along Western Avenue in this network had approximately ten collisions involving pedestrians or cyclists from 2008 to 2009 (University of California, Berkeley 2012). An increase in pedestrian and cycling activity can be expected for the area with the new Metro Expo line opening in this network, leading to an even stronger need to ensure the safety of those users.

Degenerated Hydrologic Function.

- Analysis shows subwatersheds within the engineered watersheds that drain entirely to one drain inlet. These areas are prone to flooding and provide excellent opportunities for stormwater BMPs to make high impacts. Additionally, community outreach revealed multiple alleys in this network experience frequent flooding that negatively affect the pedestrian experience.

Urban Heat Island Effect.

- There are some mature street trees throughout this neighborhood, but major gaps in the tree canopy coverage exist from trees that have died over the years and have not been replaced. Wide parkways can easily accommodate new street trees.

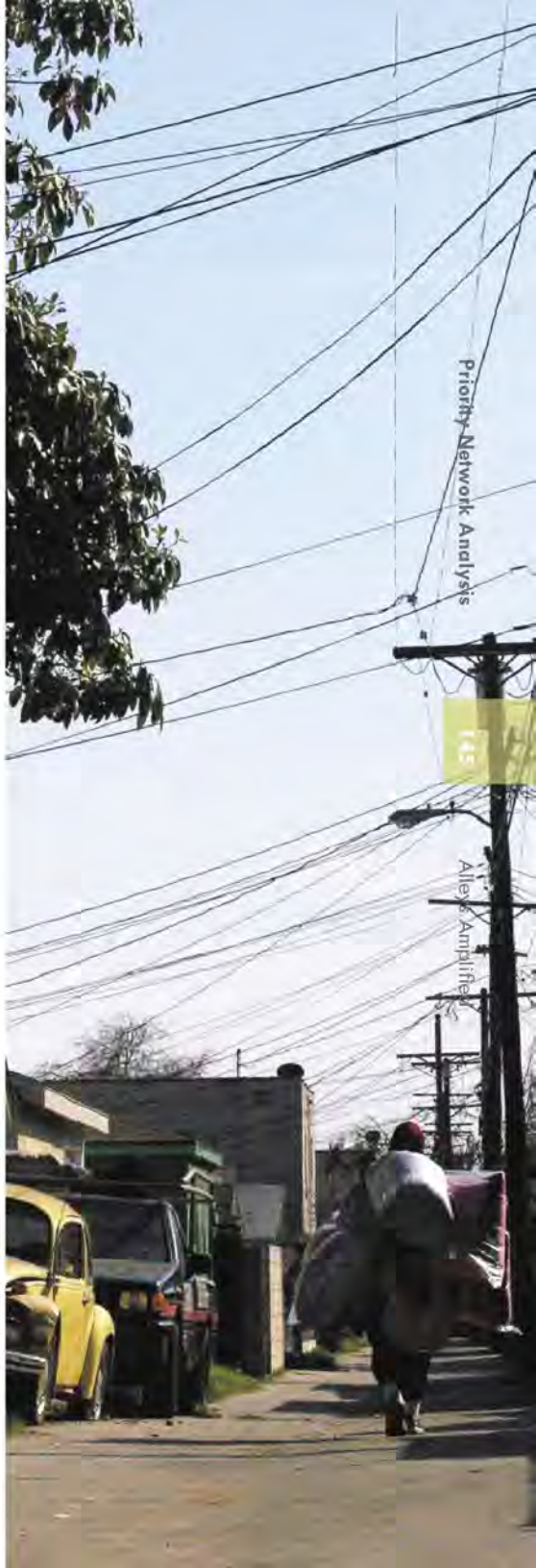


FIGURE 6.34
NARROW ALLEY IN WESTERN-MLK NETWORK



WESTERN-MLK SUITABILITIES + PRIORITIES

Western-MLK Network is composed of two smaller areas, one to the northeast and one to the southwest, that are joined by the important community destinations of Martin Luther King Jr. Park, Library, and Elementary School. Multiple bus stops and a grocery store at the intersection of Western Avenue and Martin Luther King Jr. (MLK) Boulevard are also important community destinations. The opening of the Metro Expo line, with a station at the northern edge of the network, introduces another destination with regional connections. Foshay Learning Center is just beyond the network, but students living in the Western-MLK Network neighborhood walk to the center. The AMP anticipates pedestrian circulation through the alleys that connects residents to the Expo station, learning center, park, library, and elementary school (Figure 6.35). Enhancements to Western Avenue and MLK Boulevard will make these busy thoroughfares safer and more comfortable for pedestrians and bicyclists who are traveling to destinations at the intersection of the two streets. The alleys that parallel MLK Boulevard

FIGURE 6.35
WESTERN-MLK ANTICIPATED CIRCULATION ANALYSIS



and Western Avenue will provide an alternate route for pedestrians, with existing bicycle lanes on Exposition Boulevard and proposed bike lanes along MLK Boulevard and Western Avenue connecting to destinations beyond the network.

Insufficient pedestrian and bicycle infrastructure is one of the primary issues for Western-MLK Network. Therefore, many of the alleys' designs should prioritize safe connections responses. In particular, the alleys that are immediately adjacent to and parallel with the commercial corridors have the opportunity to serve a high volume of people. The AMP recommends coordinating with City Council District 8's planned street improvements along the Western Avenue corridor as the design process continues. Improved lighting will be critical to increasing safety in the alleys, as there is currently only one lighted alley in the entire network.

Wide residential streets and parkways are well-suited for canopy trees, and alleys in both the northeastern and southwestern areas of the network are suitable for urban greening and cooling design responses. Nearly all of the alleys in the Western-MLK Network are paved with asphalt and would benefit from high albedo surfaces; those that are immediately adjacent to Western Avenue also provide the opportunity to mitigate the heat that is absorbed from low albedo surfaces and buildings.

The five alley segments that run east-west, in the southwest area of the network between 41st Street and 41st Place, contain varying degrees of overgrown vegetation and their locations make them less suitable for providing connections. These alleys should prioritize usable open space in their designs; those segments between Van Ness Avenue and Gramercy Place should additionally emphasize stormwater capture and treatment.

The six alley segments in the northeast portion of the network have central high points and slope down to street level at either end. This existing grading prevents these alleys from capturing and treating stormwater runoff from the surrounding streets, but BMPs can be placed in the parkways of the streets to treat the stormwater runoff in this area. Residents report that the two other alleys in this area, immediately east of Western Avenue, often flood during rain storms, and alley designs should be developed to resolve this issue. The entire area to the northwest of MLK Boulevard and Western Avenue, bordered to the north by 39th Street and to the west by Van Ness Avenue, drains to only one drain inlet. This area does not contain any alleys, so stormwater BMPs should be placed in the parkways where appropriate to infiltrate and reduce the volume of stormwater.



FIGURE 6.36
ALLEY IN WESTERN-MLK NETWORK

VERMONT SQUARE NETWORK PROFILE + ANALYSIS

Vermont Square Network is located in the western portion of the project area. It forms a square within the boundaries of Vernon Avenue, Normandie Avenue, 51st Street, and Vermont Avenue and contains, in addition to the park and library, two public schools, a charter school and youth center, and a community garden (Figure 6.37).

Approximate Area: 150 acres

RATIONALE FOR SELECTION

Vermont Square Network has a unique layout with Vermont Square Park and Library forming a central destination among a cluster of schools, a youth center, a community garden, and a grocery store. At least two alleys (located on either side of Raymond Ave., between 48th and 49th Streets) have been converted to parklets through previous efforts. Five pedestrian and two cyclist fatalities from 2001 to 2009 suggest a need for improvements in safety infrastructure in this primarily residential neighborhood.



FIGURE 6.37
VERMONT SQUARE NETWORK

Church
Bus Stop
Alley Gates
Open
Closed
Alley Width 15'
Alley
Network Boundary
Existing Tree Canopy



FIGURE 6.38
VIBRANT RESIDENTIAL ARCHITECTURE
CONTRIBUTES TO NEIGHBORHOOD CHARACTER



FIGURE 6.39
AN ALLEY IN VERMONT SQUARE NETWORK

VERMONT SQUARE STORMWATER CAPTURE + TREATMENT ANALYSIS

STORMWATER CAPTURE + TREATMENT OPPORTUNITIES

Gaps in the urban forest provide opportunities for street tree plantings to capture and absorb rainwater.

Alleys adjacent to commercial development (east of Normandie Avenue, west of Vermont Avenue, and south of Vernon Avenue) provide opportunities to capture and treat parking lot and large roof stormwater runoff.

Wide residential streets provide ample space for parkway stormwater BMPs; wide streets identified for BMPs include 46th Street, 47th Street, Raymond Avenue, and 50th Street.

A community garden adjacent to an alley may be able to accommodate additional stormwater BMPs.

The current stormwater flow pattern and drain inlet locations around Vermont Square

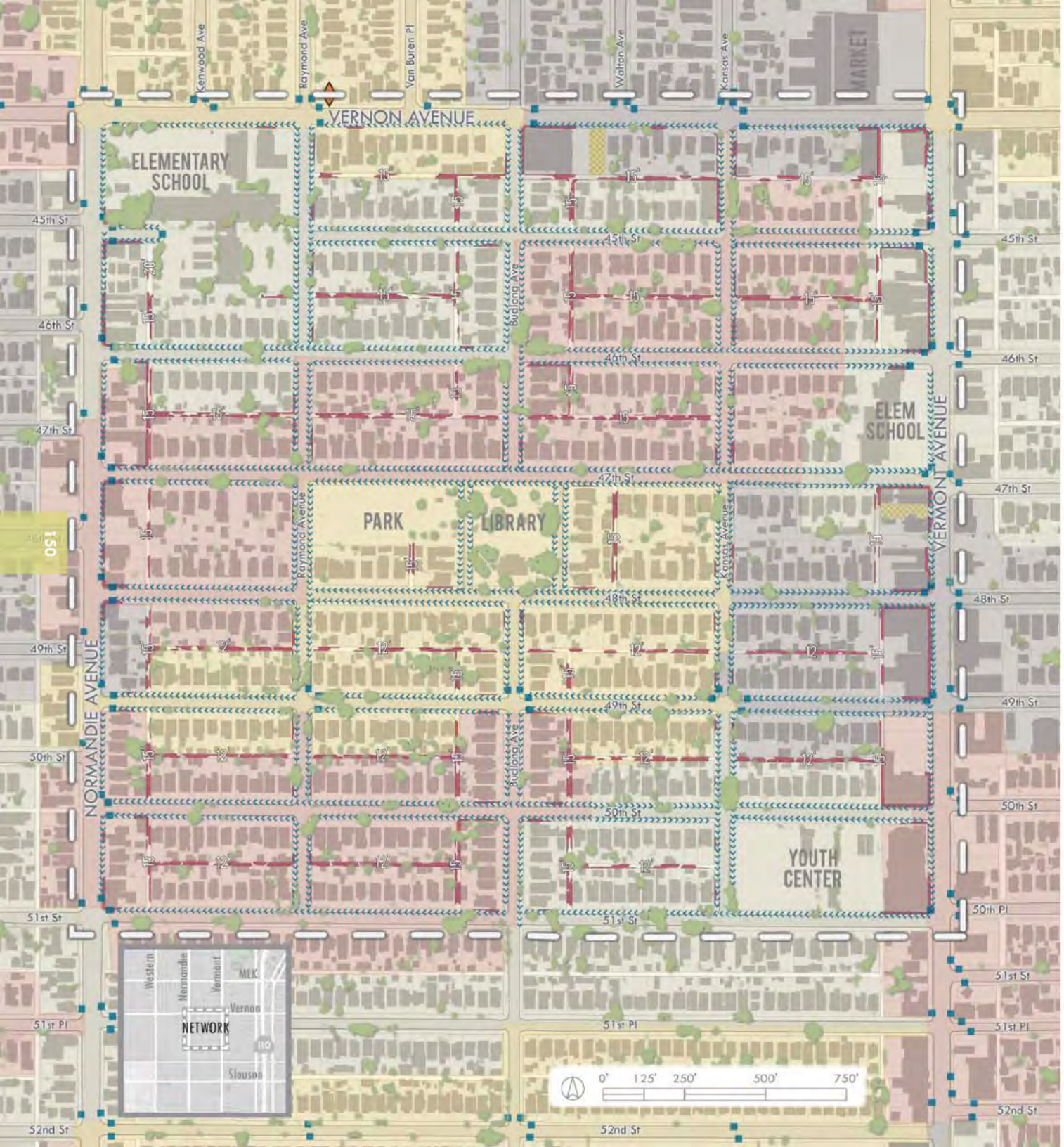


FIGURE 6.40
VERMONT SQUARE STORMWATER CAPTURE + TREATMENT ANALYSIS

Direction of Flow
Drain Inlet
Catchment Zones
Vacant Lot
Areas Within 10' of Building Foundations
Leaking Underground Storage Tank
Alley Width 15'
Network Boundary
Existing Tree Canopy

Park and the community garden located on Vermont Avenue provide opportunities to redirect runoff for infiltration.

Alleys within the network that are 15 feet wide provide space for accommodating vehicle traffic in combination with stormwater BMPs.

The repetitive pattern of alleys and streets increases the replicability and cost-efficiency of BMP implementation.

STORMWATER CAPTURE + TREATMENT CONSTRAINTS

High traffic volume and a planned bike route along Vermont Avenue constrains the availability of space in which stormwater BMPs can be installed, particularly in the handling of a higher volume of runoff from large roof and parking lot surfaces located along the commercial corridor.

Although Vermont Square Network contains two alley-adjacent vacant lots, both vacant lots are currently being used as parking lots. In the long-term, priority occupied lots may be considered for integrating larger-scale stormwater BMPs.

Nearly all alleys within the network are no greater than 15 feet wide, constraining the space available for stormwater BMPs.

The orientation of alleys in relation to engineered subwatershed boundaries restricts the ability to redirect stormwater from the streets into many of the alleys.





FIGURE 6.41 (TOP)
PARKLET IN VERMONT SQUARE NETWORK

FIGURE 6.42 (BOTTOM)
VERMONT SQUARE NEIGHBORHOOD IS PRIMARILY RESIDENTIAL

VERMONT SQUARE URBAN GREENING + COOLING ANALYSIS

URBAN GREENING + COOLING OPPORTUNITIES

Gaps in the urban forest provide opportunities for tree plantings along streets to alleviate the urban heat island effect. A lack of tree canopy indicates higher levels of heat due to more sun, and less shade and evaporative cooling.

The majority of the alleys in Vermont Square Network are paved with asphalt, providing opportunities for redeveloping with high albedo pavement.

Alleys adjacent to several tall buildings within the network provide opportunities for using green walls to mitigate the heat that is released from the building walls. Alleys located on the south or west sides of tall buildings are not shaded by the buildings in the afternoon, and are subject to the heat that is released back from those walls.

Alleys that are exposed on the west or south, due to vacant lots or parking lots, receive high levels of afternoon sun. These alleys could benefit from structures,

FIGURE 6.43
VERMONT SQUARE URBAN GREENING + COOLING ANALYSIS



canopies, trees, or other measures to provide shade and a cooler environment.

Commercial areas along Vermont Avenue, schools, and the youth center exhibit high amounts of pavement, providing opportunities for increasing vegetation in areas that are highly impermeable and have low albedo surfaces.

Alleys within the network that are 15 to 20 feet wide provide space for additional design responses like green walls or vegetated swales.

URBAN GREENING + COOLING CONSTRAINTS

Consent and cooperation of private/public property owners is required to install green roofs on buildings, in particular the schools, youth center, grocery store, and other commercial buildings along Vermont Avenue.

Limited data was available concerning plans for future street tree plantings.





FIGURE 6.44 (TOP)
ALLEY PAVED WITH ASPHALT AND ADJACENT TO TALL BUILDINGS

FIGURE 6.45 (BOTTOM)
GATED AND OVERGROWN ALLEY

VERMONT SQUARE USABLE OPEN SPACE + POTENTIAL DEVELOPMENT ANALYSIS

USABLE OPEN SPACE + POTENTIAL DEVEOPMENT OPPORTUNITIES

Eight commercial adjacent alleys provide opportunities to establish flexible spaces for commercial or community activities, such as outdoor dining, markets, and festivals.

Eight overgrown alleys, five of which are located in the southwest corner of the network, have the potential to be closed completely to vehicles and decommissioned. Furthermore, gated alleys within the network that already restrict vehicular traffic also have the potential to be decommissioned.

Direct visibility of alleys from Vernon and Vermont Avenues are opportunities to increase awareness of alleys and create gateways. High visibility also increases safety.

There is potential for closure of Budlong Avenue between 47th Street and 48th Street to be a pedestrian plaza.



FIGURE 6.46
VERMONT SQUARE USABLE OPEN SPACE ANALYSIS



USABLE OPEN SPACE + POTENTIAL DEVELOPMENT CONSTRAINTS

Four alleys of high volume traffic and five alleys of moderate-high volume traffic constrain the design responses that can be considered in the redevelopment of alleys as usable open spaces.

Crime hotspots foster perceptions of danger and inhibit the use of alleys and other public open space. Furthermore, a lack of local services and only one restaurant along the Vermont Avenue commercial corridor, resulting in low levels of activity on the streets, may be a contributing factor to high levels of crime. Efforts to overcome negative perceptions associated with Vermont Square Park should be made through outreach and community building.

Although there are two vacant lots within the network area, both are currently being used as parking lots. In the long-term, priority developed lots may be considered for redevelopment as open space.

Alley gates currently act as barriers to accessing alleys in the network. Redeveloping alleys to be publicly accessible will require outreach and cooperation from residents.

No planned community development projects, new parks and open spaces, or abandoned buildings were identified within this network, however as time progresses such opportunities may arise.



FIGURE 6.47
VERMONT SQUARE LIBRARY

VERMONT SQUARE
SAFE CONNECTIONS ANALYSIS

SAFE CONNECTIONS OPPORTUNITIES

Gaps in the urban forest provide opportunities for future tree plantings along all streets to provide shade and increase pedestrian and bicyclist comfort.

The majority of alleys within the network are T-alleys, which provide multiple connection points.

Destinations within the network include two public schools, a charter school and youth center, five churches, one grocery store, and several local stores.

The alleys running parallel to Normandie and Vermont Avenues have high visibility, providing ideal conditions for encouraging walking and bicycling. Furthermore, highly visible alleys are opportunities for wayfinding, increasing residents' awareness of alleys, and creating gateways.

Orientation and position of alleys allows

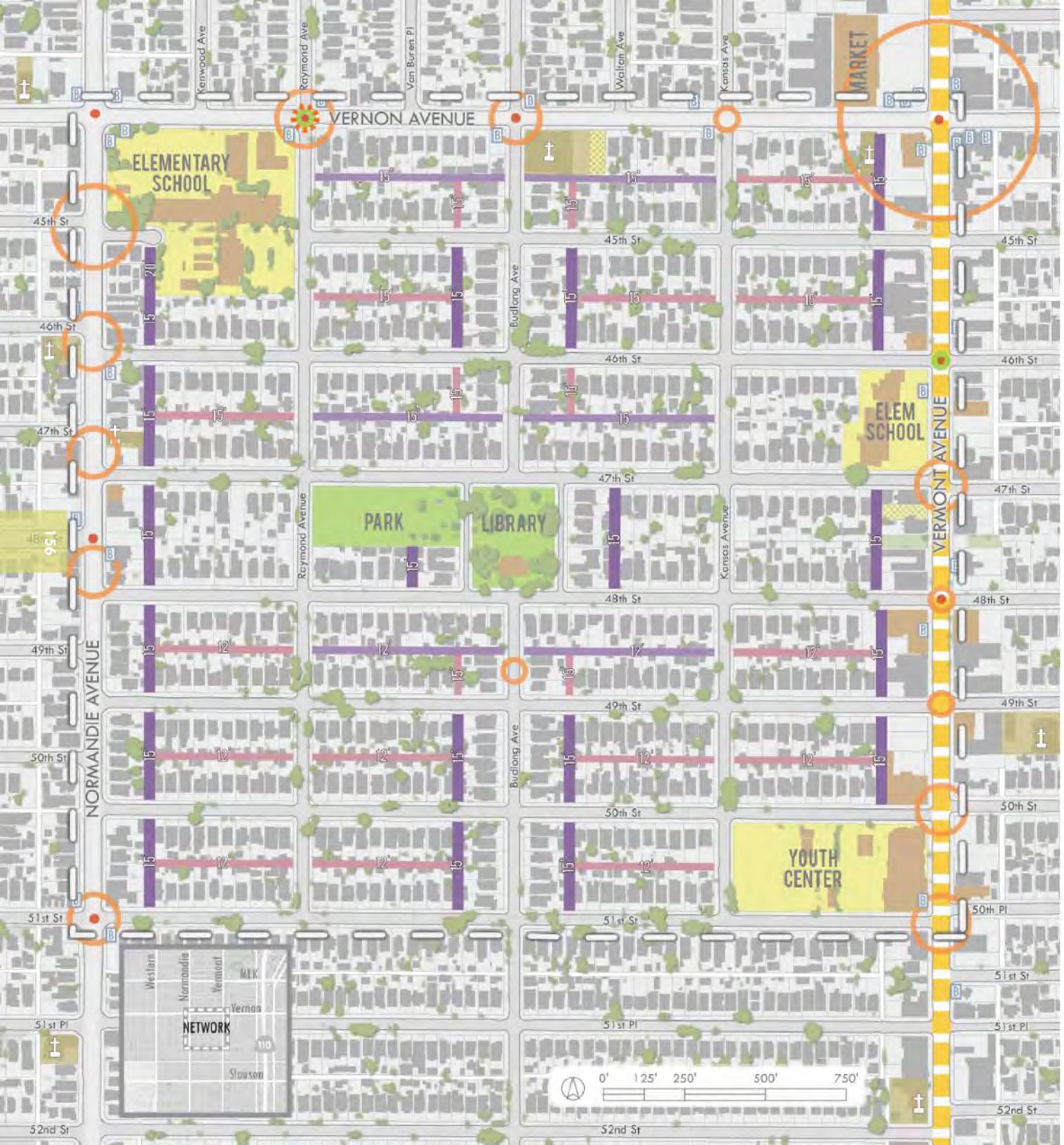


FIGURE 6.48
VERMONT SQUARE
SAFE CONNECTIONS ANALYSIS



for direct linkages between a grocery store, the Vermont Avenue commercial corridor, the proposed bike lane along Vermont Avenue, Neighborhood Network Bikeways along Budlong Avenue and 48th Street, two churches, an eye clinic, the library and park, and bus stops at the intersection of Vernon Avenue and Vermont Avenue.

A proposed bike lane on Vermont Avenue and existing bus stops along Vermont, Vernon, and Normandie Avenues provide opportunities for connecting residents to the regional transportation network.

Collision hotspots along Vermont, Vernon, and Normandie Avenues are opportunities for targeting street and intersection enhancements.

The network contains a primary, elementary, and middle (charter) school, which serve as anchors for the network as well as provide educational and stewardship opportunities.

The direct view of Vermont Square Park and Library from Budlong Avenue provides a unique sense of place and neighborhood character, and serves as a wayfinding landmark.

A community garden adjacent to an alley has the potential to increase pedestrian and bicyclist use of the green alley network, and provides opportunities for community participation and stewardship.

The consistent pattern of streets and alleys facilitates wayfinding.

As part of Safe Routes to School, the network has two crossing guards, located at the intersections of Vernon Avenue and Raymond Avenue and Vermont Avenue and 46th Street, and one flashing crossing light at the intersection of Vernon Avenue and Raymond Avenue.

SAFE CONNECTIONS CONSTRAINTS

The majority of alleys within the network are T-alleys with blind corners, constraining the design responses that can be considered in the redevelopment of alleys as safe connections.

Collision hotspots along the major roads of Normandie, Vernon, and Vermont Avenues foster perceptions of danger and inhibit the use of alleys and streets as connections.

Eleven 12 foot wide alleys restrict the accommodation of multiple user groups and some design responses, especially in combination. This constrains the ability to implement shared-use principles.

Alleys between high-activity commercial areas and low-activity residential areas require appropriate transitioning.

The primary school on Vermont Avenue creates dead end alleys, disrupting the connectivity of the network.

A grocery store located on Vernon Avenue has high traffic volumes. Design interventions must provide measures to ensure safety for pedestrians and bicyclists in this key crossing across Vernon Avenue.

Alley gates currently act as barriers to accessing alleys; redeveloping alleys to be publicly accessible will require outreach and cooperation from residents.

VERMONT SQUARE ISSUES

While all of the issues identified for the project area are relevant to some extent for each network, some issues stand out as being particularly important to address here. The primary issues affecting Vermont Square Network include:

High levels of crime.

- Vermont Square, the neighborhood in which Vermont Square Network is located, has the 11th highest rate of violent crime out of 272 Los Angeles neighborhoods. Its property crime ranking is 33rd out of 272 (Los Angeles Times 2011c and 2011d). Crime hotspots are located along Vernon and Vermont Avenues, in the northeast corner of the site. The central area of the network in and around Vermont Square Park has dispersed occurrences of crime, which do not cluster to create crime hotspots. High levels of crime lead to high levels of fear and reluctance to use public spaces.

Insufficient pedestrian and bicycle infrastructure.

- The combination of high traffic volumes along Vermont, Vernon, and Normandie Avenues (east, north, and west network boundaries respectively) and the lack of safe crossings act as barriers to walking and biking. This prohibits the major streets from fully functioning within the network of minor residential streets and alleys.

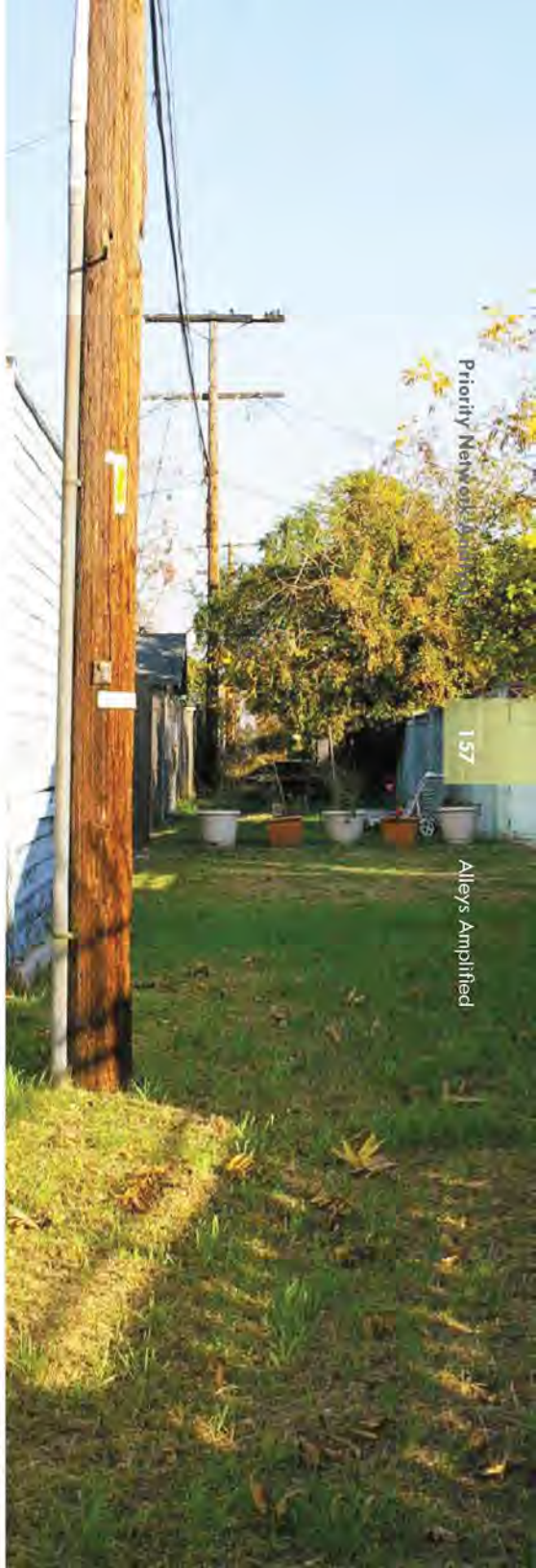


FIGURE 6.49
PARKLET IN VERMONT SQUARE NETWORK

VERMONT SQUARE SUITABILITIES + PRIORITIES

The compact nature of Vermont Square Network, the presence of multiple schools, and the network's primarily residential character can all help contribute to the success of a green alley network.

A high number of collisions, especially at the intersection of Vernon Avenue and Vermont Avenue, necessitate a priority on safe connections in the design of the green alley network. Design responses should create pedestrian- and bicyclist-friendly streets and alleys, encourage the presence of youth, and allow safe and direct connections. The section of Budlong Avenue between 47th and 48th Street could be ideal for use as a pedestrian plaza, either through a temporary or permanent closure. The Sunset Triangle Plaza located in Silver Lake (described in Appendix N) is a good example of this type of closure.

A cluster of overgrown and underutilized alleys in the southwest corner of the network should prioritize usable open space design responses. Additionally,

FIGURE 6.50
VERMONT SQUARE ANTICIPATED CIRCULATION ANALYSIS



fitness uses and amenities may be incorporated into the design response of these alleys.

The high levels of crime that this neighborhood experiences is another primary issue for Vermont Square Network. By improving the pedestrian and bicyclist infrastructure of Vermont Square Network and encouraging social activity within the neighborhood, an increase of "eyes on the street" will improve the perception of safety and encourage walking and bicycling (Newman 1972, Jacobs 1961). Studies have also evidenced that improvements in the physical infrastructure, such as improved lighting (Painter and Farrington 2001) and increased care and upkeep (Beard 2010, Cozens et al. 2005, Nassauer 1995, Wilson and Kelling 1982) will also deter crime.

The existing stormwater infrastructure in combination with alley configurations results in a potential need to place many of the stormwater BMPs in the parkways rather than alleys. However, this is not universally the case. Some segments that parallel Normandie and Vermont Avenues are suitable for stormwater BMPs, as are the alleys in close proximity to Vermont Square Park and Library.





FIGURES 6.51 (TOP) AND 6.52 (BOTTOM)
ALLEY IN VERMONT SQUARE NETWORK



QUINCY JONES NETWORK PROFILE + ANALYSIS

Quincy Jones Network is located in the northeastern portion of the project area, just west of the intersection of Central Avenue and Jefferson Boulevard. It is bordered by industrial land uses to the north (Figure 6.53).

Approximate Area: 55 acres

RATIONALE FOR SELECTION

Quincy Jones Network has the second highest combined score for the project area runoff volume, pollution levels, park poverty, and community connections models used in the network selection process (Chapter 4). Some of the alleys have extensive and elaborate murals, lending a local character and there is evidence of community stewardship, as artists were observed maintaining murals and a resident was observed sweeping the alley by his home. The network is adjacent to the Newton Community Police Station, which has been involved with The Trust for Public Land's Avalon Green Alley Demonstration Project.

FIGURE 6.53
QUINCY JONES NETWORK

FIGURE 6.54 (OPPOSITE)
A TACO TRUCK IN QUINCY JONES NETWORK

Church
Bus Stop
Alley Gates
Open
Closed
Alley Width
Alley
Network Boundary
Existing Tree Canopy

STOP
LOS BURRITOS
La Misena

STORMWATER CAPTURE + TREATMENT OPPORTUNITIES

Alleys ranging from 15 to 20 feet wide provide ample space for stormwater BMPs.

Large industrial rooftops and parking areas provide surface areas with large volumes of stormwater runoff which can be re-directed to new capture opportunities. By capturing and treating runoff from industrial land uses, new BMPs have the opportunity to remove larger concentrations of water pollutants from the storm drain system than similar BMPs could remove in entirely residential neighborhoods.

The shift in the street grid has created irregular intersections, which have potential for infiltration or filtration planters. One such opportunity is the five-way intersection of Jefferson Boulevard, Griffith Avenue, and 36th

FIGURE 6.55
QUINCY JONES STORMWATER CAPTURE + TREATMENT ANALYSIS



Street, which could be redesigned to encourage slower traffic speeds in front of Quincy Jones Elementary School, and which in turn could eliminate a 40-foot roadway segment in front of a liquor store parking lot. Other opportunities to reduce the amount of paved roadway are the intersections of 31st and 32nd Streets, and that of Jefferson Boulevard, 34th Street, and Wadsworth Avenue.

Wide travel lanes on San Pedro Street and Jefferson Boulevard near the intersection of both streets can be reduced to allow for infiltration opportunities. Jefferson Boulevard's travel lanes also widen in front of Quincy Jones Elementary School. While this street design allows space for student pick-up and drop-off, alternate design solutions could encourage slower vehicle speeds while allowing for infiltration of stormwater flow.

Neither the volume of traffic on Jefferson Boulevard, nor the necessary level of access to adjacent properties, appear high enough to warrant preserving the existing center turn lane. The turn lane instead could accommodate a planted median, which could capture and filter stormwater runoff and provide refuge for crossing pedestrians.

Currently, there is little need for driveway access in front of the church property along 34th Street and Jefferson Boulevard, as well as street frontage adjacent to a separate church parking lot on Wadsworth Avenue. These areas allow placement of tree wells and large planters.

Two alley-adjacent vacant lots provide greater opportunities for stormwater capture.

Two 20 foot wide alleys provide opportunities to add BMPs while maintaining truck access. Little to no driveway access is needed in the three L-shaped short alleys, increasing their potential to accommodate BMPs.

STORMWATER CAPTURE + TREATMENT CONSTRAINTS

The density of industrial buildings and facilities may require larger minimum lane and roadway widths, street parking for large trucks, and paving which can support heavy loads. This could restrict placement of stormwater BMPs along industrial area streets.

Relatively high traffic volume along San Pedro Street limits the space available for stormwater BMPs.

Vehicle access is currently required in nearly every portion of each alley segment, limiting the stormwater BMPs that can be installed.

A relatively large distribution of drain inlets throughout the site quickly capture and divert stormwater runoff.

Streets within the network do not form a regular grid but include an offset sector.

FIGURE 6.56 (TOP)
INDUSTRIAL PARKING LOT IN QUINCY JONES NETWORK

FIGURE 6.57 (BOTTOM)
ALLEY-ADJACENT VACANT LOT IN QUINCY JONES NETWORK





QUINCY JONES URBAN GREENING + COOLING ANALYSIS

URBAN GREENING + COOLING OPPORTUNITIES

The network's many large industrial buildings provide opportunities to encourage green roof adoption in the neighborhood where structural engineering may allow for the weight of these innovations. Such adaptations could begin with the large roof areas on the classroom buildings of Quincy Jones Elementary School.

Gaps in the urban forest provide opportunities for tree plantings along streets to alleviate the urban heat island effect. A lack of tree canopy indicates higher levels of heat due to more sun, and less shade and evaporative cooling.

Alleys adjacent to several taller buildings within the network provide opportunities for using green walls to mitigate the heat that is released from the building walls. Alleys located on the south or west sides of tall buildings are not shaded by the buildings in the afternoon, and are subject to the heat that is released back from those walls.

FIGURE 6.58
QUINCY JONES URBAN GREENING + COOLING ANALYSIS



Alleys that are exposed on the west or south, due to vacant lots or parking lots, receive high levels of afternoon sun. These alleys could benefit from structures, canopies, trees, or other measures to provide shade and a cooler environment.

URBAN GREENING + COOLING CONSTRAINTS

The network's relatively large number of industrial facilities may require increased minimum lane and roadway widths, street parking for large trucks, and paving which can support heavy loads. This could restrict the space available for street trees, plantings, and other urban greening and cooling responses.

Relatively high traffic volume along San Pedro Street limits the space available for vegetation.

Consent and cooperation of private/public property owners is required to install green roofs on buildings, in particular the large industrial buildings and Quincy Jones Elementary School. In addition, roof support engineering must allow the additional weight of green roof infrastructure.

Limited data was available concerning plans for future street tree plantings.





FIGURES 6.59 (TOP) AND 6.60 (BOTTOM) INDUSTRIAL BUILDINGS IN QUINCY JONES NETWORK

QUINCY JONES
USABLE OPEN SPACE + POTENTIAL DEVELOPMENT ANALYSIS

USABLE OPEN SPACE + POTENTIAL DEVELOPMENT OPPORTUNITIES

The busy activity along Central Avenue provides spill-over foot traffic into adjacent alleys, encouraging open space use.

Two alley-adjacent vacant lots located on 32nd Street, at Stanford Avenue and Central Avenue, provide excellent opportunities for pocket parks or other open space interventions.

Two T-shaped alleys with good visibility, high levels of pedestrian activity, and use by youth for recreation space provide recreation and open space opportunities.

Little to no driveway access is needed in three short L-shaped alleys, which can be re-designed to create safe play spaces, recreation spaces, or bird and wildlife habitat.

The recent development of entirely new school grounds has the potential to



FIGURE 6.61
QUINCY JONES USABLE OPEN SPACE ANALYSIS

Alley Traffic
- High
- Mod. High
- Moderate
- Mod. Low
- Low

Vacant Lot
Church
Bus Stop
Existing Tree Canopy

Crime Reports
- Violent Crime
- Property Crime

note: multiple rings indicate more crime incidents

Alley Width 15'
Network Boundary

benefit the entire community through such programs as joint use agreements between the school district and the City's Department of Recreation and Parks, or through innovative new programs such as "Community-School Parks" (People for Parks Los Angeles 2012).

The adjacent Southern Pacific right-of-way creates opportunity for innovation. While several sections have been left to deteriorate, others have reverted to a wild and natural state, fenced off and inaccessible to neighbors.

None of the alleys are gated.

Well-maintained artwork exists along some streets and alleys, making them more interesting and inviting open spaces.

At least five new lights have recently been installed in one alley segment (bounded by 31st and 32nd Streets and Stanford and Griffith Avenues), indicating an effort to increase safety and thereby improving its usability as an open space.

USABLE OPEN SPACE + POTENTIAL DEVELOPMENT CONSTRAINTS

Vehicle access is currently required in nearly every portion of each alley segment, so alleys may not be easily closed to vehicular traffic for providing open space.

Long alleys and T-shaped alleys have poor visibility within them, and can hinder safety and perceptions of safety, which in turn discourages use of these open spaces. Additionally, most alleys are poorly lit.

Four liquor stores are located in the commercial corridors of the network, creating several areas with potential nuisance behavior that may discourage their use as open space.

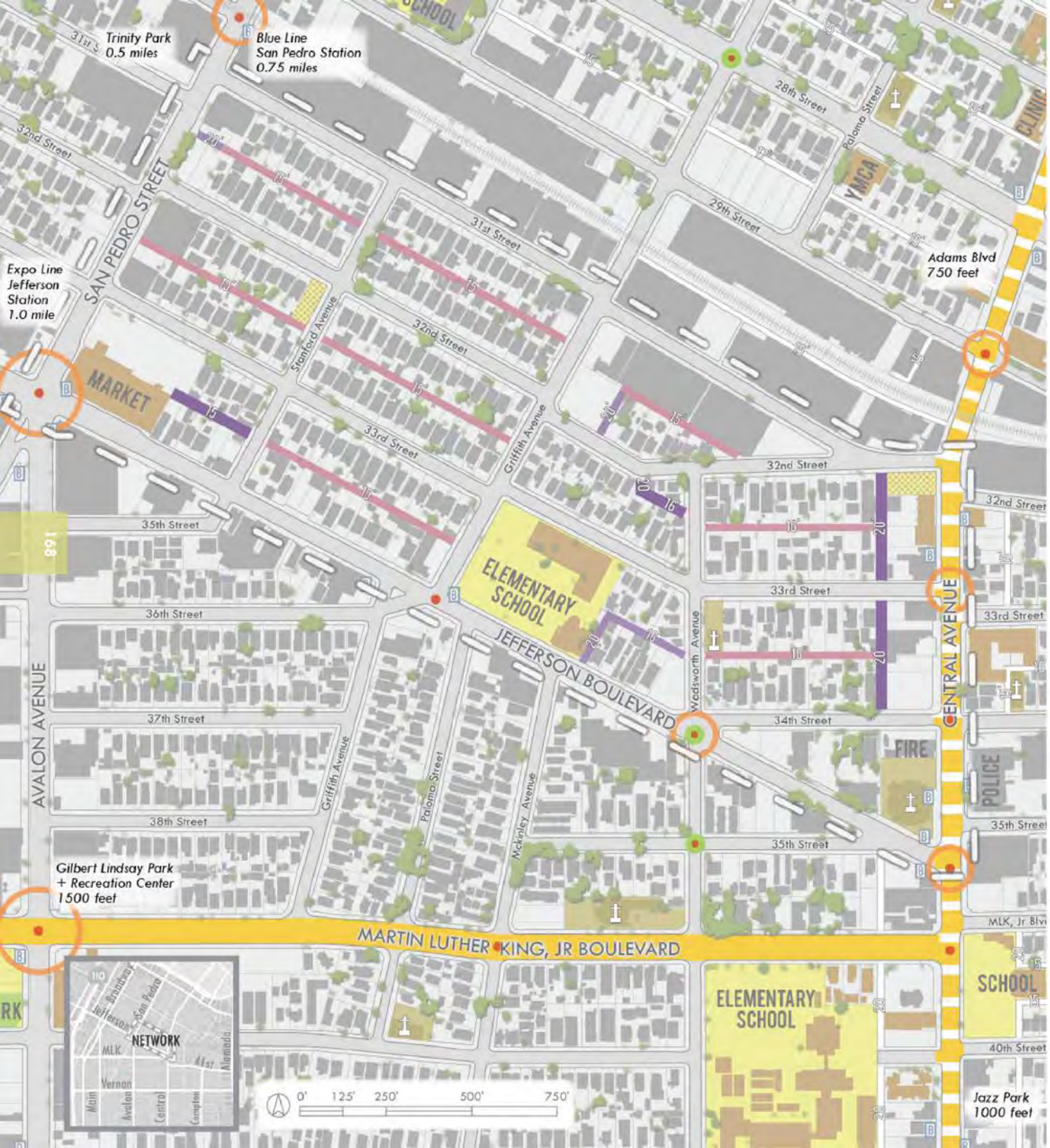
No planned community development projects, new parks and open spaces, or abandoned buildings were identified within this network, however as time progresses such opportunities may arise.





FIGURE 6.62 (TOP)
QUINCY JONES ELEMENTARY SCHOOL

FIGURE 6.63 (BOTTOM)
CHILDREN PLAY IN A QUINCY JONES NETWORK ALLEY



QUINCY JONES
SAFE CONNECTIONS ANALYSIS

SAFE CONNECTIONS OPPORTUNITIES

Central Avenue is a community retail spine, with several four-story mixed-use buildings, as well as multiple grocery stores and community centers. This combination of high-density housing and community destinations facilitates walking and bicycling within the network.

The redesign of intersections along Jefferson Boulevard can slow vehicular traffic, provide shade along pedestrian paths of travel, shorten street crossing distances, ease access to bus stops, improve comfort at bus stops, and create a safer and more inviting pedestrian environment.

Alleys ranging from 15 to 20 feet wide provide space for "complete street" redesign.

Several irregularly-shaped alleys lend interest, variety, and serve as points of reference with regards to wayfinding.

FIGURE 6.64
QUINCY JONES
SAFE CONNECTIONS ANALYSIS



At least five new lights have recently been installed in one alley segment (bounded by 31st and 32nd Streets and Stanford and Griffith Avenues), indicating an effort to increase safety and visibility.

None of the alleys are gated.

Well-maintained artwork exists along some streets and alleys, increasing their interest and attractiveness as pedestrian and bicyclist routes.

Two T-shaped alleys with good visibility, high levels of pedestrian activity, and current use by youth for recreation provide support for increasing their use as community connections.

SAFE CONNECTIONS CONSTRAINTS

The narrow industrial corridor to the north of the network is in fair condition, with inadequate lighting, which makes the area uninviting for pedestrian passage by day, and worse at night. The industrial zone acts as a barrier to pedestrian movement.

Busy traffic along San Pedro Street, Jefferson Boulevard, and Central Avenue act as pedestrian barriers.

Long alleys and T-shaped alleys have poor visibility within them, and can reduce safety and perceptions of safety.

Most alleys are poorly lit, hindering visibility and safety.

A shift in the street grid geometry results in unaligned street connections. There is no path of travel entirely within the alleys that traverses the site.

Four liquor stores are located in the commercial corridors of the network, creating several areas with potential nuisance behavior that may discourage their use as safe connections.

QUINCY JONES ISSUES

While all of the issues identified for the project area are relevant to some extent for each network, some issues may stand out as being particularly important to address. The primary issues affecting Quincy Jones Network include:

Lack of access to open space and recreation opportunities.

- Four parks are within a half mile to three-quarters of a mile from the network, but reaching each requires crossing more than one busy street. Varying levels of gang presence exist at some parks.

Impaired water quality.

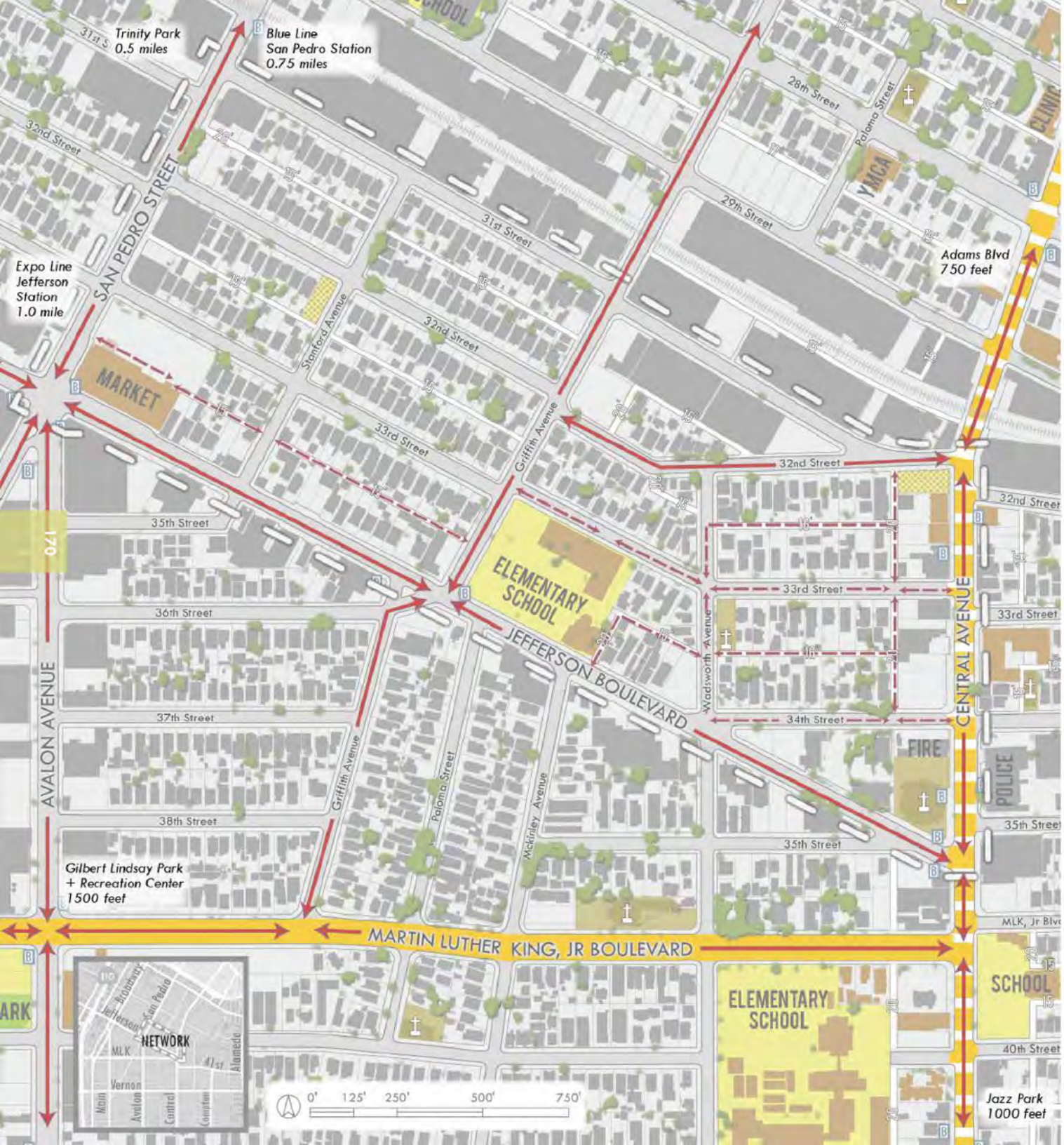
- The high level of industrial zoning creates both relatively high volumes of runoff and high levels of runoff pollutants.





FIGURE 6.65 (TOP)
MIXED-USE BUILDING ON CENTRAL AVENUE

FIGURE 6.66 (BOTTOM)
WIDE ALLEY WITH MURALS
IN QUINCY JONES NETWORK



QUINCY JONES SUITABILITIES + PRIORITIES

Quincy Jones Network lies within a compact and clearly defined neighborhood. The site is easy to navigate for residents and visitors alike on account of its compactness, dual street grid, clear street and alley hierarchy, and recognizable landmarks. The street geometry and landmarks give the neighborhood a clear sense of place, which in turn gives the site the basis for much of its character. AMPlified alleys will serve as alternate pedestrian routes through the neighborhood, and new bicycle infrastructure improves safety for bicyclists along streets that connect to resources in the neighborhood and beyond. Figure 6.67 illustrates the anticipated movement of pedestrians and bicyclists .

With the lack of open space as one of the primary issues for this network, the priority for the north-south segments of the two T-shaped alleys should be usable open space. Their adjacency to Central Avenue provides for a diverse mix of commercial uses, single-family residences, and multi-family residences along them and visibility is relatively good. The short alley lengths

FIGURE 6.67
QUINCY JONES ANTICIPATED CIRCULATION ANALYSIS



are relatively wide at 20 feet and a vacant lot could provide additional open space. The east-west segments of the T-shaped alleys should prioritize safe connections in order to link residents to the new alley open spaces and the businesses and bus stops on Central Avenue. On each site visit, slightly different existing uses were observed, such as truck unloading, bicycle deliveries, taco trucks and ice cream trucks, push carts, graffiti artists, ball playing, alley maintenance, and neighbors on their porch watching passers-by. However, there were also mixed levels of dumping. These sites are opportunities to demonstrate the neighbors' interest and involvement in the space through decorative paving and lighting. Simple design interventions can make these alleys feel like intentional spaces, rather than leftover driveways.

The two alley segments connecting Numero Uno Supermarket, at the northeast corner of San Pedro Street and Jefferson Boulevard, with Quincy Jones Elementary School should prioritize safe connections. The grocery store is a destination for neighbors of all ages, and a very important one in a part of Los Angeles with a severe shortage of fresh food. While the school is not a destination for all neighbors, preliminary outreach interviews and surveys suggested that many children in this area walk to school. This alley is a preferable route to the busy and exposed Jefferson Boulevard corridor.

Central Avenue is the eastern terminus of Jefferson Boulevard, a street that represents the divider between street grids in South Los Angeles, and which ties the site to the University of Southern California and neighborhoods beyond. Enhancements for the streetscape could represent the street's prominence, and Jefferson Boulevard is wide enough to accommodate improvements such as street trees and wider sidewalks or a planted median. Such improvements could themselves become an opportunity to examine places for stormwater BMP locations.

Almost every alley segment is suitable for stormwater capture and treatment. As impaired water quality is another primary issue for this network, the AMP recommends implementing appropriate stormwater BMPs throughout the network.





FIGURE 6.68 (TOP)
MURAL IN A QUINCY JONES ALLEY

FIGURE 6.69 (BOTTOM)
ALLEY TERMINATING AT A GROCERY STORE



BROADWAY-75TH NETWORK PROFILE + ANALYSIS

Broadway-75th Network is located in the southern portion of the project area, immediately east of Interstate 110 and south of Florence Avenue (Figure 6.70). It contains an elementary school, public library, and police station, but no parks or recreation centers.

Approximate Area: 170 acres

RATIONALE FOR SELECTION

Broadway-75th Network is located in an extremely park-poor neighborhood, with relatively few community resources. As a result, the community could benefit greatly from the park and recreational opportunities created by green alley networks. This is the only high-priority network in the southern portion of the project area.

FIGURE 6.70
BROADWAY-75TH NETWORK

FIGURE 6.71 (OPPOSITE)
BROADWAY IN BROADWAY-75TH NEIGHBORHOOD

Church
Bus Stop
Alley Gates
Open
Closed
Alley Width
Alley
Network Boundary
Existing Tree Canopy

305 WIMITED
5149
JOSY'S
SHOES
3 PARES DE ZAPATOS
POR $20

BROADWAY-75TH STORMWATER CAPTURE + TREATMENT ANALYSIS

STORMWATER CAPTURE + TREATMENT OPPORTUNITIES

Two vacant lots on Broadway, at the bottom of their engineered subwatersheds, provide opportunities for larger-scale filtration or infiltration interventions.

Long (950-feet-long) alleys provide space for stormwater BMPs.

Two 20-foot-wide alleys provide space for vehicle traffic and stormwater BMPs.

The repetitive pattern of alleys and streets increases the replicability and cost-efficiency of BMP implementation.

Gaps in the urban forest provide opportunities for tree plantings along all streets for capturing and absorbing rainwater.

Parkways along east-west residential streets provide ample space for stormwater capture and treatment BMPs.



FIGURE 6.72
BROADWAY-75TH STORMWATER CAPTURE + TREATMENT ANALYSIS

Alley Pavement
- Asphalt
- Concrete
- Broken Pavement
- Unpaved
- Overgrown

Existing Tree Canopy

- Alley-Adjacent Paving
- Alley-Adjacent Buildings Over One Story
- Vacant Lot
- Alley Width 15'
- Network Boundary

STORMWATER CAPTURE + TREATMENT CONSTRAINTS

Under current city regulations, 12-foot-wide alleys cannot accommodate infiltration BMPs if there are building foundations within ten feet. The majority of the alleys within the network are 12 feet wide.

Some alleys exhibit poor drainage with persistent ponding.

The orientation of alleys in relation to engineered subwatershed boundaries restricts the ability to redirect stormwater from the streets into many of the alleys.

Appropriate precautions should be taken when designing BMPs in the vicinity of the leaking underground storage tank (LUST) northwest of the intersection of Main Street and 79th Street.



FIGURE 6.73 (TOP)
12-FOOT-WIDE ALLEY WITH ADJACENT BUILDINGS IN BROADWAY-75TH



FIGURE 6.74 (BOTTOM)
POOR DRAINAGE IN A BROADWAY-75TH ALLEY

BROADWAY-75TH URBAN GREENING + COOLING ANALYSIS

URBAN GREENING + COOLING OPPORTUNITIES

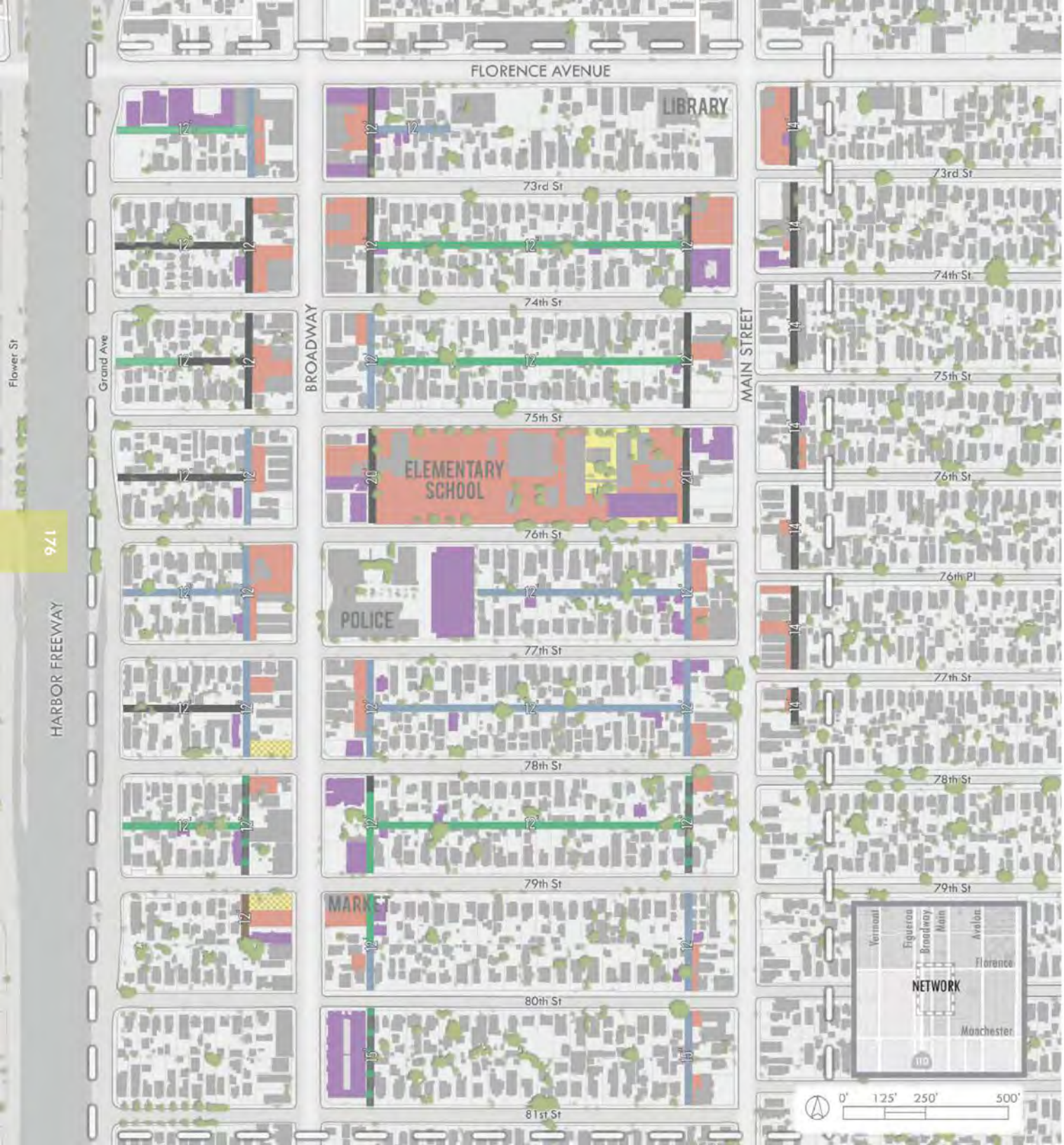
Gaps in the urban forest provide opportunities for tree plantings along streets to alleviate the urban heat island effect. A lack of tree canopy indicates higher levels of heat due to more sun, and less shade and evaporative cooling.

The median between the Harbor Freeway and Grand Avenue provides additional space for canopy trees and other plantings.

Alleys adjacent to several tall buildings within the network provide opportunities for using green walls to mitigate the heat that is released from the building walls. Alleys located on the south or west sides of tall buildings are not shaded by the buildings in the afternoon, and are subject to the heat that is released back from those walls.

Alleys that are exposed on the west or south, due to vacant lots or parking lots, receive high levels of afternoon sun. These alleys could benefit from structures, canopies, trees, or other measures to provide shade and a cooler environment.

FIGURE 6.75
BROADWAY-75TH URBAN GREENING + COOLING ANALYSIS



Alleys paved with asphalt provide opportunities for lowering the urban heat island effect by replacement with high albedo pavement.

The 75th Street Elementary School grounds are paved with asphalt, and provide the opportunity to lower the urban heat island effect by introducing vegetation and high albedo materials.

The proximity to the freeway necessitates BMPs to improve air quality. Canopy trees that are effective for filtering particulates also help to mitigate the urban heat island effect.

Long (950 feet long) alleys provide extra space for urban greening and cooling BMPs.

URBAN GREENING + COOLING CONSTRAINTS

Twelve foot wide alleys restrict the accommodation of vehicle traffic in combination with some urban greening and cooling design responses.

Consent and cooperation of private/ public property owners is required to install green roofs on buildings, in particular the 75th Street Elementary School, police station, and commercial buildings.

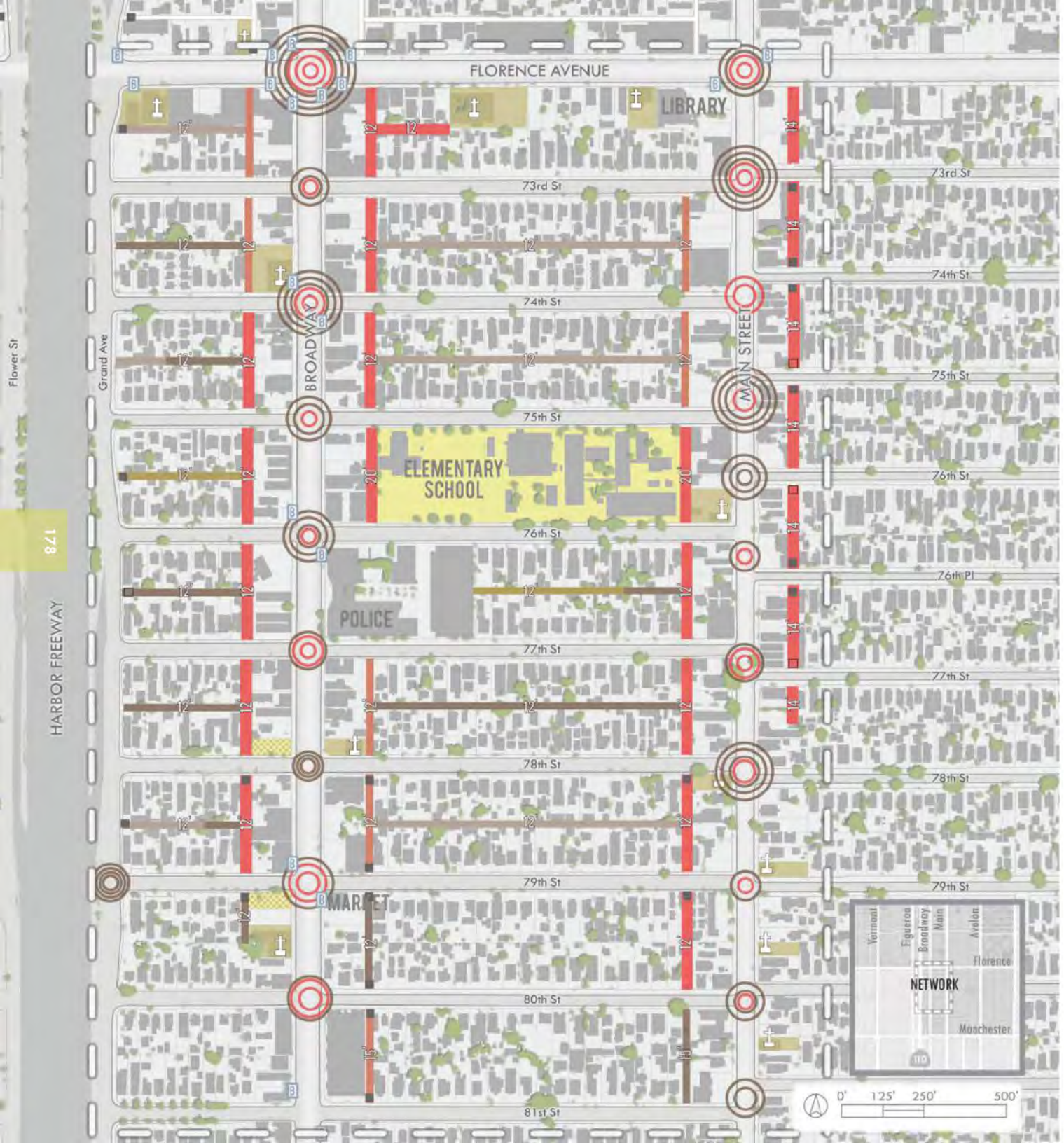
Limited data was available concerning plans for future street tree plantings.



FIGURE 6.76 (TOP)
ASPHALT ROAD WITH SCARCE TREE CANOPY IN BROADWAY-75TH



FIGURE 6.77 (BOTTOM)
NARROW ALLEY IN BROADWAY-75TH



BROADWAY-75TH USABLE OPEN SPACE + POTENTIAL

DEVELOPMENT ANALYSIS

USABLE OPEN SPACE + POTENTIAL DEVELOPMENT OPPORTUNITIES

In the long-term, safety and usability of the long dead end alley north of 77th Street could be improved if an adjacent property becomes vacant to create an opportunity for a pocket park and second point of access to the alley.

The long central segments of H-shaped alleys between Broadway and Main Street are an opportunity to create communal backyards, under the care and stewardship of the adjacent residents.

Short dead-end alleys with good visibility may be good candidates for parklets.

Alleys that are overgrown with vegetation have an established condition of not being used by vehicles, creating an opportunity to close them to traffic or decommission.

Gated alleys already restrict vehicular traffic, and may have the potential to be closed completely to vehicles.

FIGURE 6.78
BROADWAY-75TH USABLE OPEN SPACE ANALYSIS

Alley Traffic
- High
- Mod. High
- Moderate
- Mod. Low
- Low

Vacant Lot
Church
Bus Stop
Existing Tree Canopy

Crime Reports
- Violent Crime
- Property Crime

note: multiple rings indicate more crime incidents

Alley Width 15'
Network Boundary

Alleys with a high percentage of homes that access parking from the street may be used as flexible spaces, and potentially be decommissioned.

USABLE OPEN SPACE + POTENTIAL DEVELOPMENT CONSTRAINTS

Twelve-foot-wide alleys restrict the accommodation of some open space design responses.

Pervasive violent crime increases fear and may inhibit some neighbors from using open spaces.

The proximity of the network to the freeway leads to higher levels of air and noise pollution, conditions not ideal for open spaces.

Alleys that are currently overgrown with vegetation and not being used by vehicles may potentially become vehicular space if vegetation is removed.

No planned community development projects, new parks and open spaces, or abandoned buildings were identified within this network, however as time progresses such opportunities may arise.





FIGURE 6.79 (TOP)
GATED ALLEY IN BROADWAY-75TH

FIGURE 6.80 (BOTTOM)
OVERGROWN ALLEY IN BROADWAY-75TH



BROADWAY-75TH SAFE CONNECTIONS ANALYSIS

SAFE CONNECTIONS OPPORTUNITIES

Collision hotspots involving pedestrians and bicyclists indicate a need for improved pedestrian and bicyclist safety infrastructure.

Clusters of destinations located along commercial corridors generate activity and can be served by improved pedestrian and cyclist networks.

Short (<300 feet long) alleys parallel the commercial corridors of Broadway and Main Street, and can serve as alternative routes for pedestrians and bicyclists.

A planned bike lane on 79th Street will provide connections beyond the network, and generate bicyclist activity within the network.

The 75th Street Elementary school and a number of places of worship throughout

FIGURE 6.81
BROADWAY-75TH
SAFE CONNECTIONS ANALYSIS

the network serve as destinations within the network as well as provide educational and stewardship opportunities.

An historic firehouse building on Florence Avenue offers unique neighborhood character and sense of history, and could serve as a community center and anchor for the green alley network.

Short alleys (<300 feet long) provide greater visibility, safety, and perception of safety.

As part of Safe Routes to School, the network has one crossing guard and flashing light at the intersection of Broadway and 75th Street.

SAFE CONNECTIONS CONSTRAINTS

Twelve-foot-wide alleys restrict the accommodation of multiple user groups and some design responses, especially in combination. This constrains the ability to implement shared-use principles.

Pervasive violent crime increases fear and may inhibit some neighbors from walking and bicycling.

Collision hotspots involving pedestrians and bicyclists increase the perception of danger and may inhibit some neighbors from walking or bicycling in the neighborhood.

The proximity to the freeway leads to higher levels of air and noise pollution, conditions not ideal for pedestrian or bicyclist comfort and health.

The police station interrupts the pattern of alleys, breaking continuous travel from block to block.

The long alley that dead ends into the police station poses a safety concern, with only one access point and poor visibility.

Long (950 feet long) and H-shaped alleys have poor visibility and negatively affect safety and perception of safety.

Alley gates prevent pedestrians and bicyclists from using the alley as a shortcut.

BROADWAY-75TH ISSUES

While all of the issues identified for the project area are relevant to some extent for each network, some issues may stand out as being particularly important to address. The primary issues affecting Broadway-75th Network include:

Lack of access to open space and recreation opportunities.

- The nearest park is almost three-quarters of a mile from the network, and is on the other side of the freeway. It is a small, four acre recreation center, in a neighborhood with a population density of over 20,000 persons per square mile.

High levels of crime.

- Florence, the neighborhood in which Broadway-75th Network is located, has the twelfth highest rate of violent crime out of 272 Los Angeles neighborhoods. Its property crime rate is within the highest 17% (Los Angeles Times 2011c and 2011d).

Insufficient pedestrian and bicycle infrastructure.

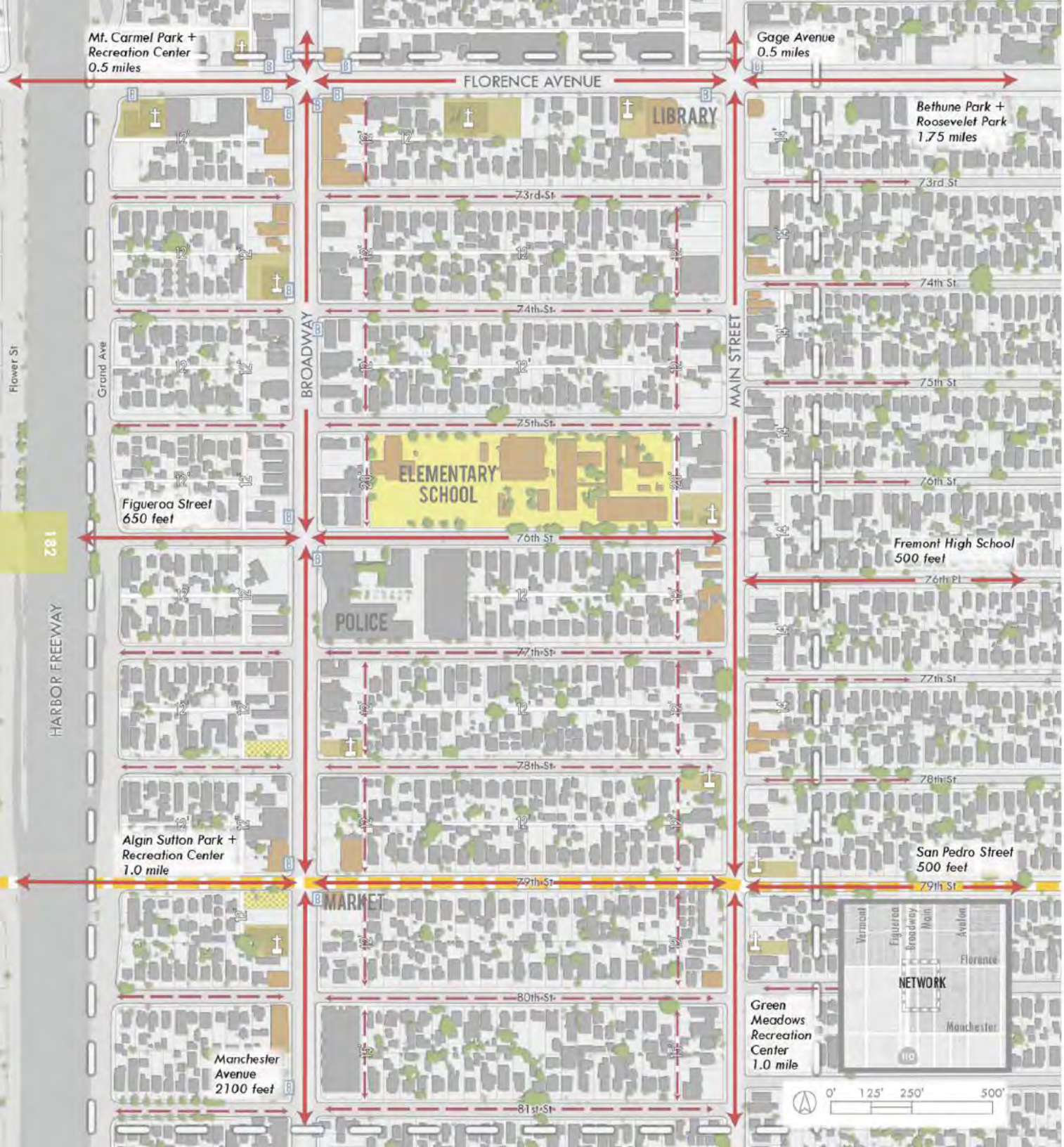
- The area of the Broadway-75th Network has no bicycle lanes or paths, and 30% of collisions reported in the years 2008-2009 involved pedestrians or bicyclists (University of California, Berkeley 2012). On average a pedestrian or cyclist was hit by a car every eight to nine days during this two year period.



FIGURE 6.82 (TOP)
PEDESTRIANS IN AN ALLEY, BROADWAY-75TH NETWORK



FIGURE 6.83 (BOTTOM)
PEDESTRIAN CROSSING AT 78TH AND BROADWAY



BROADWAY-75TH NETWORK SUITABILITIES + PRIORITIES

The Broadway-75th Network contains clusters of community destinations located on Broadway at Florence Avenue and at 79th Street, and on Main Street at its north end as well as at 76th Street. The 75th Street Elementary School is a destination located in the middle of the network. With a configuration of mostly H- and T-shaped alleys in the Broadway-75th Network, the AMP anticipates pedestrians utilizing the north-south alleys that parallel Broadway and Main Street as alternate routes to these busy streets. East-west pedestrian routes could follow the quieter residential streets. There is a potential for new bike lanes on Broadway and Main Street, Florence Avenue, 76th Street, and 79th Street. These bike lanes would connect the primary destinations within the network, and also lead to parks, recreation centers, and a high school beyond the network.

Due to the extremely poor access to parks and recreation opportunities in the neighborhood, this network prioritizes creating new and safe open spaces

FIGURE 6.84
BROADWAY-75TH ANTICIPATED CIRCULATION ANALYSIS



and recreation opportunities. Three long alleys running east-west between Broadway and Main Street, three short alleys running east-west between Grand Avenue and Broadway, and two short dead end alleys have conditions that support their conversion to usable open space. One of the dead end alleys, located southwest of 79th Street and Broadway, is adjacent to a vacant lot, which could provide additional recreational open space.

Additionally, the high rate of collisions along Broadway and Main Street indicates the need for the enhancement of pedestrian and bicycle infrastructure. Intersections along Broadway and Main Street should receive enhanced safety infrastructure for pedestrians and cyclists, particularly those that experience recurring collisions. East-west residential streets between Broadway and Main Street, which have a history of collisions, should receive traffic calming design responses in order to slow vehicular traffic, discourage excessive cut-throughs, and protect pedestrians and bicyclists. Short alleys that parallel Broadway and Main Street should be redeveloped to prioritize pedestrian and bicyclist users as these alleys provide an alternate route to said busier, high traffic streets. The historic firehouse on Florence Avenue is adjacent to one of these shorter alleys and could anchor the network as a community center.

Alleys that parallel Main Street to the east are well-suited for stormwater capture and treatment, as are the T-shaped alleys in the blocks between Grand Avenue and Broadway. These alleys, as well as the median strip between Grand Avenue and the Harbor Freeway, should also prioritize mitigating air pollution from the freeway. Air pollution solutions should additionally contribute to reducing the urban heat island effect. Stormwater BMPs should be placed in the parkways in areas where they are less suitable for the alleys.



FIGURE 6.85
ADAPTIVE USE OF AN ALLEY



SECONDARY



ANALYSIS + INPUT



7. SECONDARY ANALYSIS + INPUT

Analysis brings together information gathered during previous stages of the project. It combines the most relevant existing conditions with the desired alley infrastructure approaches, determined through outreach and input, in order to identify the most salient issues, opportunities, and constraints affecting the project. With the priority network selection and analysis complete, a secondary stormwater analysis was performed which sought to understand the potential of each high priority alley and alley network to infiltrate stormwater runoff. In addition, an extensive community outreach process in order to determine residents' priorities for alley programming and design was conducted. Working in harmony, these data subsets were used to guide and inform the alley network concept designs presented in Chapter 8.

7-A. STORMWATER INFILTRATION MODELING ANALYSIS

In order to conduct a stormwater infiltration analysis in GIS, a secondary review of the recommendations in the AMP as well as the GIS data that informed the AMP recommendations was conducted. This pre-analysis review revealed significant potential challenges for storm water infiltration in the five alley networks identified in the AMP. In the "City of Los Angeles Department of Building and Safety Guidelines for Stormwater Infiltration" (Appendix K), design requirements state that the minimum distance between an infiltration facility and the adjacent private property line or foundations shall be ten feet. Given that few alleys are greater than 20 feet wide, it becomes difficult and costly to install infiltration BMPs within them, as the only way to meet this requirement is to bury the infiltration system at a great depth. A potential exception is for grassy swales, which can be located a minimum of five feet from a property line or building (City of Los Angeles Bureau of Sanitation 2011). A detailed diagram (Figure 7.2) illustrates how the restriction concerning infiltration BMPs and proximity to building foundations can be a constraint for green alley and green street development. The left graphic shows extensive areas of alleys and parkways that are within ten feet of building foundations and are restricted in the potential for stormwater BMPs. The right graphic, however, illustrates alleys with greater areas available for infiltration since the constraint of a minimum of ten feet from building foundations is less limiting. In addition to constraints presented by the proximity of building foundations to alleyways, the data also revealed that an alley-by-alley storm water volume feasibility analysis should be completed to understand the volume of runoff an alley may receive under current conditions in its subengineered watershed. This study was conducted, see Appendix E.

For these purposes, AMP authors developed additional GIS layers to inform modeling using the Groundwater Augmentation Model (GWAM), developed by the US Department of Interior Bureau of Reclamation. GWAM estimates runoff and infiltration within areas, therefore the alleyways were converted from line features used during the primary phase of project and network area analysis to polygon representations of the alley right-of-way. Additionally, a new GIS layer was created to provide GWAM with a theoretical contributing area to each alley. This contributing area is indicated as Alley Catchment (Estimated) in the detailed maps for each alley within the 5 high priority networks in Appendix E. Using GWAM, AMP authors used the contributing areas and historical precipitation to generate both the estimated runoff volume and the estimated runoff volume that could be captured if the alley was redesigned to infiltrate a ¾" storm event. The methodology is described in detail later in this section.

FIGURE 7.1
BUILDING FOUNDATIONS DIRECTLY ADJACENT TO AN ALLEY IN THE AMP PROJECT AREA

FIGURE 7.2 (OPPOSITE)
DIAGRAMS ILLUSTRATING 10' BUFFER AROUND BUILDING FOUNDATIONS


42nd Street
42nd Place
43rd Street
CENTRAL AVENUE
Martin Luther King, Jr. Boulevard
40th Place
41st Street
Naomi Avenue
Secondary Analysis + Input
187
Alleys Annulled
20'
12'
15'

INITIAL ESTIMATES FROM STORMWATER INFILTRATION MODELING ANALYSIS					
NETWORK NAME	CENTRAL-JEFFERSON HIGH	WESTERN-MLK	VERMONT SQUARE	QUINCY JONES	75TH-BROADWAY
NUMBER OF ALLEYS	25	27	25	11	27
NETWORK TOTAL ALLEY AREA (SQ FT)	15,3578	19,6754	22,4985	93,082	20,0052
NETWORK TOTAL BUILDING SETBACK AREA (SQ FT)	59,040	129,858	124,526	37,803	89,475
NETWORK TOTAL INFILTRATION AREA (SQ FT)	94,538	66,896	100,459	55,279	110,577
NETWORK TOTAL PERCENT OF ALLEY SURFACES AVAILABLE FOR INFILTRATION BMPS	62%	34%	45%	59%	55%
MIN. AREA AVAILABLE	24%	7%	22%	32%	17%
MAX. AREA AVAILABLE	89%	75%	81%	84%	89%

INFILTRATION CONSTRAINTS

Because infiltrating water near a structure can be challenging as described previously in this section, a 10-foot infiltration exclusion zone was assigned to structures adjacent to the alleys. The resulting GIS layer indicated surface area available for infiltration outside of the 10-foot building exclusion zone. The initial estimates from the modeling exercise indicate that 3 of 5 of the alley networks have 56% or greater alley surface area available to infiltrate storm water runoff (Table 7.3).

Although results reinforce the initial assessment of these alleys' ability to capture and infiltrate stormwater runoff, further analysis related to the hydrologic conditions and engineering requirements is required to ensure the feasibility of infiltrating stormwater runoff in each alley network and the alleys that comprise the network. This analysis expands on the initial AMP findings and can inform the prioritization, design, and engineering phases of South Los Angeles green alley projects.

DATA DRIVEN BMP SELECTION CONSIDERATIONS

Prior to developing finalized designs for each of the alley networks and their respective alleys, AMP authors recommend refining the analysis to include the following pre-design considerations for South Los Angeles green alley projects:

- Verify the 10-foot infiltration exclusion zone for each alley. Prioritize infiltration in alleys that are not required to have an extensive 10-foot infiltration exclusion zone. The Council for Watershed Health's experience with the Elmer Paseo indicated that the exclusion zone does not overtly limit the volume of water that can be infiltrated, however it is an important factor in cost benefit analysis conducted during the design and engineering phases of a green alley project.
- Verify the volume of runoff directly draining to the alley on an annual basis in order to assess the potential to redirect sheet flow from alley adjacent streets into BMPs located within the alleys. The Avalon Green Alley Demonstration Project will redirect stormwater flows from streets into alley located BMPs and The Council for Watershed Health's experience with the Elmer Avenue and Elmer Paseo retrofits echoes this feature. The City of Los Angeles recently re-graded the intersection of Stagg St. and Fair Ave. to direct additional runoff flows to Elmer Avenue BMPs. Initial analysis needs to account for the volumes that may be present in current flow conditions and then design for excess capacity that can be included in a cost-benefit engineering analysis.
- Determine the volume of runoff that should be targeted for capturing a ¾" storm event.
- Develop a detailed analysis of surface flow direction in and around the alleys.

ADDITIONAL USES OF THE DATA FOR PRE-PLANNING

The results of this secondary stormwater analysis can assist with the population the Environmental Protection Agency's (EPA) Stormwater Calculator. The Council for Watershed Health reported that comments were offered to the EPA about the Calculator, which has limited utility in Metro Los Angeles County because it lacks underlying data about multiple factors, including soil and precipitation. Table 7.4 illustrates which fields used in this analysis are suggested for specific inputs in the EPA model.

TABLE 7.3 (OPPOSITE)
INITIAL ESTIMATES FROM STORMWATER INFILTRATION MODELING ANALYSIS

TABLE 7.4
SUGGESTED FIELDS FOR THE EPA'S STORMWATER CALCULATOR

SUGGESTED FIELDS FOR THE EPA'S STORMWATER CALCULATOR

ANALYSIS FIELD	EPA MODEL INPUT
Location Tab	Catchment Acres
Soil Type Tab	Soil_type_letter
Soil Drainage Tab	KSAT
Topography Tab	Slope
Land Cover Tab	Catchment_Perc_impervious
LID Controls Tab	.75"

DATA SETS FOR ALLEY CONTRIBUTING AREA AS PRODUCED BY GWAM	
ALLEY'S CONTRIBUTING AREA VALUES FROM GWAM (IN AVERAGE ANNUAL CUBIC FEET)	
ITEM	FIELD
Precipitation	PRECIP_CUFT_1
Runoff	RUNOFF_CUFT_1
Current condition infiltration	INFILT_CUFT
Current condition deep perc	DEEPPERC_CUFT
Expected 3/4 inch storm diversion volume from both pervious and impervious areas	Total_RDR_cuft
ALLEY'S CONTRIBUTING AREA VALUES FROM GWAM (IN SQUARE FEET OF SURFACE AREA)	
ITEM	FIELD
Impervious area based on land use	LU_IMPERV_SQFT
Area of catchment	LU_AREA_SQFT
Area of residential and use	ResLU_AREA_SQFT
Area of commercial land use	ComLU_AREA_SQFT
Area of industrial land use	IndLU_AREA_SQFT
ALLEY'S CONTRIBUTING AREA VALUES FROM GWAM AS PERCENTAGES	
ITEM	FIELD
Percentage of residential land use area	Perc_ResLU
Percentage of residential land use runoff	Perc_ResRUNOFF
Percentage of commercial land use area	Perc_CommLU
Percentage of commercial land use runoff	Perc_CommRunoff
Percentage of industrial land use area	Perc_IndLU
Percentage of industrial land use runoff	Perc_IndRUNOFF
ALLEY INFORMATION	
ITEM	FIELD
Surface area for infiltration sq. ft.	INFILT_AREA_SQFT
Soil Name	polygon_SOIL_NAME
Soil KSAT (in. / hr.)	KSAT
Soil field capacity (in. / ft.)	FieldCapacity
606 Studio network ID	Network_ID
606 Studio network type	NetwrkType

METHODOLOGY AND DATA OUTPUT REVIEW

The Groundwater Augmentation Model (GWAM) was designed for and validated at a regional scale. The output values from GWAM in this analysis do not reflect the exact conditions around the AMP high priority alley networks, but are an approximation suitable for making management decisions.

First, to determine the alley right-of-way and viable area for infiltration, the alley areas were processed by creating polygons from initial AMP analysis alley line features and removing any areas that overlapped the parcel layer and the street right-of-way (many of the initial AMP analysis alley lines continue across streets). The resulting polygons reflect the area of the alley that could be retrofitted. The alley areas were then tagged with the amount of surface area unavailable for infiltration due to falling within the 10-foot building exclusion zone. To do this the AMP authors used the following data:

- LA County parcel layer
- LA County Enterprise GIS CAMS streets layer
- 606 studio alley networks
- TPL Green Alley Network Boundary
- 2012 LARIAC 1 foot imagery
- 2008 LA County Building Outlines

Second, to estimate the volume of water that may naturally flow to the alley in the current conditions (not including any

TABLE 7.5
DATA SETS FOR ALLEY CONTRIBUTING AREA AS PRODUCED BY GWAM

redirection from the street), each alley group within a city block was assigned an approximate contributing area. To do this, each alley group was buffered 80 feet, a distance corresponding to the approximate observable back yards of the residential properties adjacent to the alleys. This area was then trimmed to the city block using the Parcel layer and assigned as the alley's contributing area. GWAM was run on these areas to produce multiple data sets for each alley's contributing area. These data sets are outlined in Table 7.5.

The impact that green alley projects in this area can have in terms of stormwater management is great. Because the project area is located over the LA forebay, which is capable of storing and releasing large quantities of groundwater and allows percolation into deeper aquifers that replenish the groundwater basin, designs should prioritize the stormwater infiltration and capture potential of each alley.

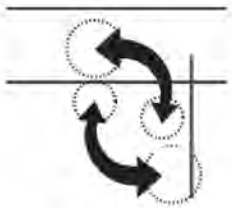
While the stormwater findings in this chapter are only preliminary calculations, the potential benefit to the augmentation of local water supply should not be underestimated. Table 7.6 illustrates the infiltration potential of each alley network should ¾" BMPs for each alley catchment area be applied. In fact, if an engineering analysis determines that infiltration can occur to the fullest extent possible as outlined in these calculations, and all green alley networks are designed to their full potential (¾" BMPs for each alley catchment area), this plan has the capacity to infiltrate 4,264,615 cubic feet of stormwater annually. However, if the potential to infiltrate stormwater in alleys from adjacent street is realized as well, the infiltration and recharge capacity of this proposal is only that much greater.

TABLE 7.6
RUNOFF CAPTURED BY ¾" DESIGN BMP'S BY NETWORK

RUNOFF CAPTURED BY 3/4" DESIGN BMP'S BY NETWORK		
CENTRAL-JEFFERSON HIGH NETWORK	Impervious Runoff Captured by 3/4" design BMP (cu. ft.)	812,065
	Pervious Runoff Captured by 3/4" design BMP (cu. ft.)	50,553
	Combined Runoff Captured by 3/4" design BMP (cu. ft.)	**862,618**
WESTERN-MLK NETWORK	Impervious Runoff Captured by 3/4" design BMP (cu. ft.)	925,665
	Pervious Runoff Captured by 3/4" design BMP (cu. ft.)	113,340
	Combined Runoff Captured by 3/4" design BMP (cu. ft.)	**1,039,005**
VERMONT SQUARE NETWORK	Impervious Runoff Captured by 3/4" design BMP (cu. ft.)	705,763
	Pervious Runoff Captured by 3/4" design BMP (cu. ft.)	70,731
	Combined Runoff Captured by 3/4" design BMP (cu. ft.)	**776,494**
QUINCY JONES NETWORK	Impervious Runoff Captured by 3/4" design BMP (cu. ft.)	466,007
	Pervious Runoff Captured by 3/4" design BMP (cu. ft.)	27,490
	Combined Runoff Captured by 3/4" design BMP (cu. ft.)	**493,497**
BROADWAY-75TH NETWORK	Impervious Runoff Captured by 3/4" design BMP (cu. ft.)	1,049,007
	Pervious Runoff Captured by 3/4" design BMP (cu. ft.)	43,994
	Combined Runoff Captured by 3/4" design BMP (cu. ft.)	**1,093,001**



Create Open Space



Create Connections



Reduce Crime



Clean Water



Prevent Flooding



Reduce Urban Heat Island Effect

Community participation has been defined as a tool that allows for the redistribution of power from privileged communities to those that are generally excluded from economic and political processes (Arnstein 1969). Through the process of community participation, local residents are able to be included in the future of their neighborhoods, resulting in design end products that are representative of the needs of the community. In addition, community participation fosters placemaking, allowing the design style to be reflective of a community's unique identity. Community input creates places that are context driven, and when neighborhood residents are invested in a local project, pride of place and stewardship for the completed project are fostered. In the development of green alleys, community outreach is a valuable tool at all stages.

In addition to preliminary project area-wide outreach efforts discussed in Chapter 5, extensive outreach was conducted at the individual network scale as part of a secondary phase of outreach. The goal of such efforts was to understand opportunities and constraints within the networks, as well as to establish potential programming options and a network alley design 'theme' as envisioned by community residents given each network's unique identity.

In order to engage residents, a number of outreach techniques were employed. These included surveys, walking and photo inventories, and dotmocracy prioritizing. To ensure all community members were able to give their input on some level, materials and presentations were conducted in both English and Spanish. In addition, activities were available that were non-linguistic in format (dotmocracy/photo inventories) in order to provide access to young adults, children and those with limited literacy. These techniques were made available to community members and stakeholders through a variety of activities, including sidewalk surveys, tabling at community events, and workshops/presentations with key community groups.

To further involve community members in outreach efforts, local high school students were hired for about 25-50 hours of work to be completed during after school and weekend hours, as well as on school breaks. Approximately ten interns, many of whom were fluent in both Spanish and English, were hired to:

- work in groups of 2-3 to conduct community surveys at key locations within each previously identified alley network on 3-5 survey days,
- compile information gleaned from surveys,
- participate in other organizing activities, including door-to-door outreach, tabling at events, attending and presenting at community meetings, and
- complete 2-4 hours of training with employees of The Trust for Public Land on engaging community members and surveying processes.

In all, over 40 tabling/workshop/presentation events were conducted over a six month period from February to July of 2014. This chapter includes a description of each technique and a summary of results found. Connections between the results and their application to design priorities and considerations as they are relevant to the project area and the individual networks are also described. While some of the content is specific to this project, the materials and techniques presented herein are replicable to other community driven design projects. A full list of materials and data summaries are provided in Appendix G.

FIGURE 7.7
BENEFITS OF GREEN ALLEYS

COMMUNITY SURVEYS

A community survey was developed and administered to provide information on the types of activities South Los Angles community members would like to see in green alleys as well as to help identify existing issues and concerns that will need to be addressed. A total of 1,338 community members participated in the study within a six month period of time (February to July 2014) with a comparable distribution of surveys collected in each of the five priority networks (Figure 7.10). Approximately 20% of the total number of surveys came from each of the individual networks, with between 238 and 292 respondents per network.

Surveying was conducted at a variety of events to engage as many people as possible and ensure a wide range of participants in the study. This step was critical in procuring the most representative sample of the whole of the South Los Angeles community. Such events where surveys were collected included open houses, tabling, community meetings, workshops, and presentations. The result of this was that surveys were collected from participants with a range of experiences, including diverse ages, ethnicities, length of time having resided in individual neighborhoods, etc., which will ensure a more accurate planning response.



FIGURE 7.8
COMMUNITY OUTREACH INTERN
CONDUCTING SURVEYS



Specific networks were explored further to gain place-based, place-specific, and experiential information.

Of all survey participants, a full 70% (936 participants) indicated they are residents of the AMP project area. Of these, 44% reported living within one of the six high-priority networks, with a relatively equal distribution between each network. This works out to an average of 268 residents per network who responded to the survey.

Based on survey responses, there is an average number of 4.418 members per household in the project area, with 59% of the 1,251 who responded to the survey's household question having children at home. The highest number of children reported by respondents fell within the age range of 5-12 years old, at 41%, followed by children between the ages of 13-18 years old, at 34%. The survey also asked respondents how many years they have lived in their neighborhood, which revealed that 44% of those who answered the question (1,308) have been a resident for 10 years or more. Given that the majority of respondents live in the AMP project area and nearly half live in one of the high-priority networks, the information gleaned from the surveys can be determined to be of value to the planning of the network designs. In addition, since almost half of the respondents have lived in the area for 10 years or more, it can be assumed that the surveys are reflective of community members who have a rich experience with, and an investment in, the AMP project area.

The survey asked participants if and how they use their local alleyways. Over 95% (1,276) of those surveyed responded to this question, and of that, 60% responded that they do use their local alleyways. Furthermore, nearly 72% (959) of all those surveyed provided additional information by answering multiple choice questions on how they use alleyways. Because participants selected multiple uses in the questionnaire, note that total calculations exceed 100%. Figure 7.11 illustrates that 67% of respondents reported that their use of alleys involves walking through them to get to a destination. Other respondents reported that they use the alleyways for walking or running for exercise, biking, and vehicular usage in regards to passage, access, and parking. Respondents were provided a write-in area to describe other

FIGURE 7.9 (LEFT)
COMMUNITY OUTREACH INTERN CONDUCTING SURVEYS

FIGURE 7.10 (RIGHT)
SURVEYS COLLECTED BY NETWORK

NETWORK	SURVEYS COLLECTED	% TOTALS
Central-Jefferson High	278	21%
Quincy Jones	292	22%
Broadway-75th	238	18%
Western-MLK	270	20%
Vermont Square	260	19%
TOTAL	**1338**	**100%**

activities performed within alleys outside of those listed in the survey. Vehicular usage was a common write-in response with an overall 8% total response.

These patterns of use are similar for each of the specific alley networks. For each network, 59% to 62% of respondents reported that they currently use their neighborhood alleyways, with 42% to 51% of the activity being composed of walking to get to a destination (Figure 7.14).

These responses on alleyway use varied from those given concerning alleyway use by the children of respondents. 70% (689) of those who responded to the question said that their children do not use the alleyways, with only 30% of respondents indicating that they did. These results were fairly consistent among each of the networks.

Participants were also asked what they like about their alleys. Nearly 74% (986) of all those surveyed included comments, with 59% of those indicating that there was nothing they liked about their alleys. Of the remaining responses, 15% of total respondents indicated that they like their alleys because they provide pasageways and shorcuts from one destination to another. Other likes included less vehicular traffic, using the alley for passive recreation, such as sitting, enjoying solitude and quite, and using the alley for active recreation.

To contextualize current use, as well as provide information that could impact intended future alley use, respondents were asked if they have specific concerns about their local alleys or if there were reasons they do not use them. Of the 1,338 participants in the survey, 1,306 responded to the question regarding specific concerns. Note that participants often responded with multiple concerns for a total of 1,611 individual responses, resulting in total amounts that exceed 100%. Responses ranged from concerns about traffic, maintenance, safety, and a lack of desired features. A high 73% of respondents stated that maintenance issues, including illegal dumping, degraded surfacing and graffiti, were of most concern. Traffic, in the form of driven or parked cars, was also a primary concern, as indicated by 22% of respondents. Again, participants were provided an opportunity to write-in additional comments not listed in the survey options. 23% percent of participants included additional comments, which revealed a significant concern (8% of write-in responses) regarding trash, dumping, and dirt. In equal measure, illicit activities, including drug use, prostitution, crime and violence accounted for 8% of the write-in answers (Figure 7.12.)

Comparing responses between identified networks, safety was a main topic of concern, but varied widely by specific network. As illustrated in Figure 7.13, safety was a more significant topic of concern for the Central-Jefferson High network (reported by 28% of respondents) and the Vermont Square network (with 8% of respondents). Figure 7.14 illustrates that generally there were equal distributions among alley use responses between networks.

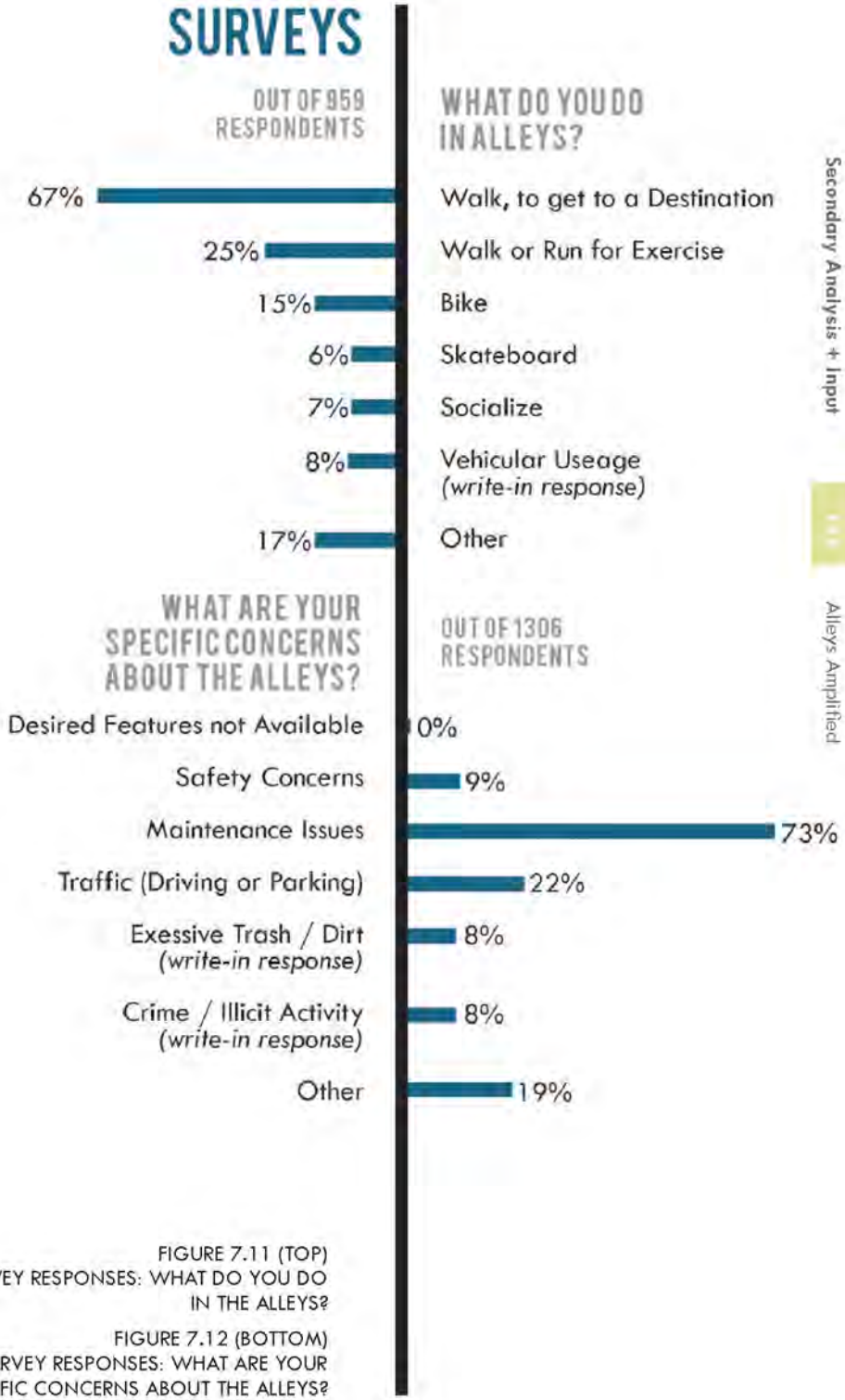
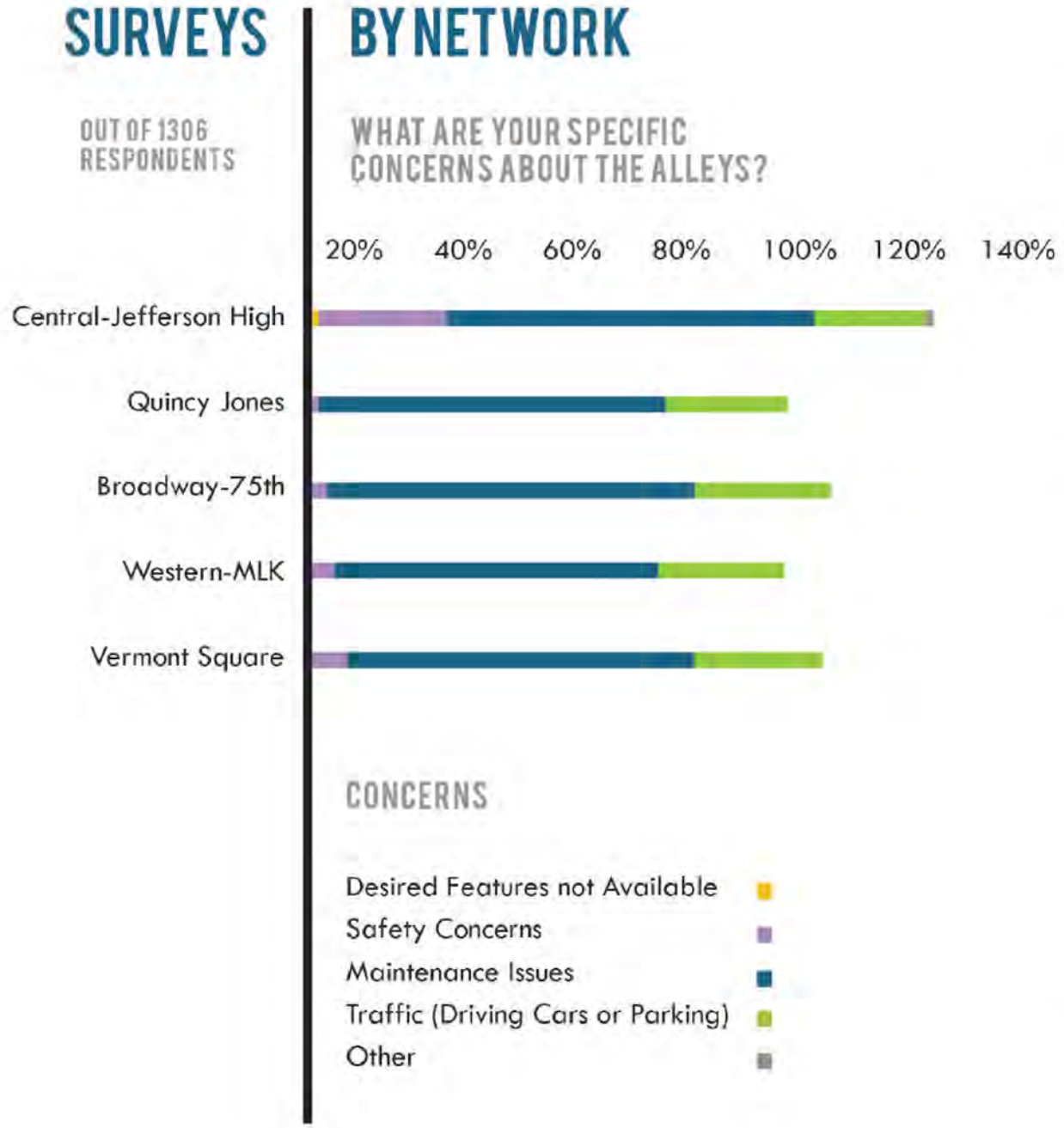


FIGURE 7.11 (TOP)
SURVEY RESPONSES: WHAT DO YOU DO IN THE ALLEYS?

FIGURE 7.12 (BOTTOM)
SURVEY RESPONSES: WHAT ARE YOUR SPECIFIC CONCERNS ABOUT THE ALLEYS?



Some abnormalities that stand out are that both Quincy Jones and Broadway-75th have the highest reported use of alleys as a cut through to a destination. In addition, residents in Vermont Square and Quincy Jones indicated that alleys were used as a place for walking or running for exercise. Broadway-75th had the highest reported alley use by bicycle or skateboard.

Support for green alley projects is high in the AMP project area. Though the response rate was low for the question 'If alleys were renovated, would you use them?', an overwhelming 88% of those who did respond reported 'yes,' that they would use the alleyways if they were renovated. Interestingly, 91% of people who responded to the question from the Central-Jefferson High network reported 'yes' - the highest of all alley networks.

Information gathered through the surveys presents a broader understanding of individuals living in and adjacent to the AMP project area and how they relate to alleys in their community. This information lays a foundation for how alleys can and should be used in the future based on community needs and desires. For instance, since alleys are most used as a passageway to get to a destination, creating safe, accessible, and comfortable passages through design is a priority in all of the alley networks. The use of alleys as

FIGURE 7.13
SURVEY RESPONSES BY NETWORK: WHAT ARE YOUR SPECIFIC CONCERNS ABOUT THE ALLEYS?

a space for active recreation, like running, can also be supported in alley designs. Some network specific issues, specifically addressing safety concerns in both the Central Jefferson High and Vermont Square networks, can be addressed in alley design through adequate lighting and increasing and/or maintaining visibility within the alleys.

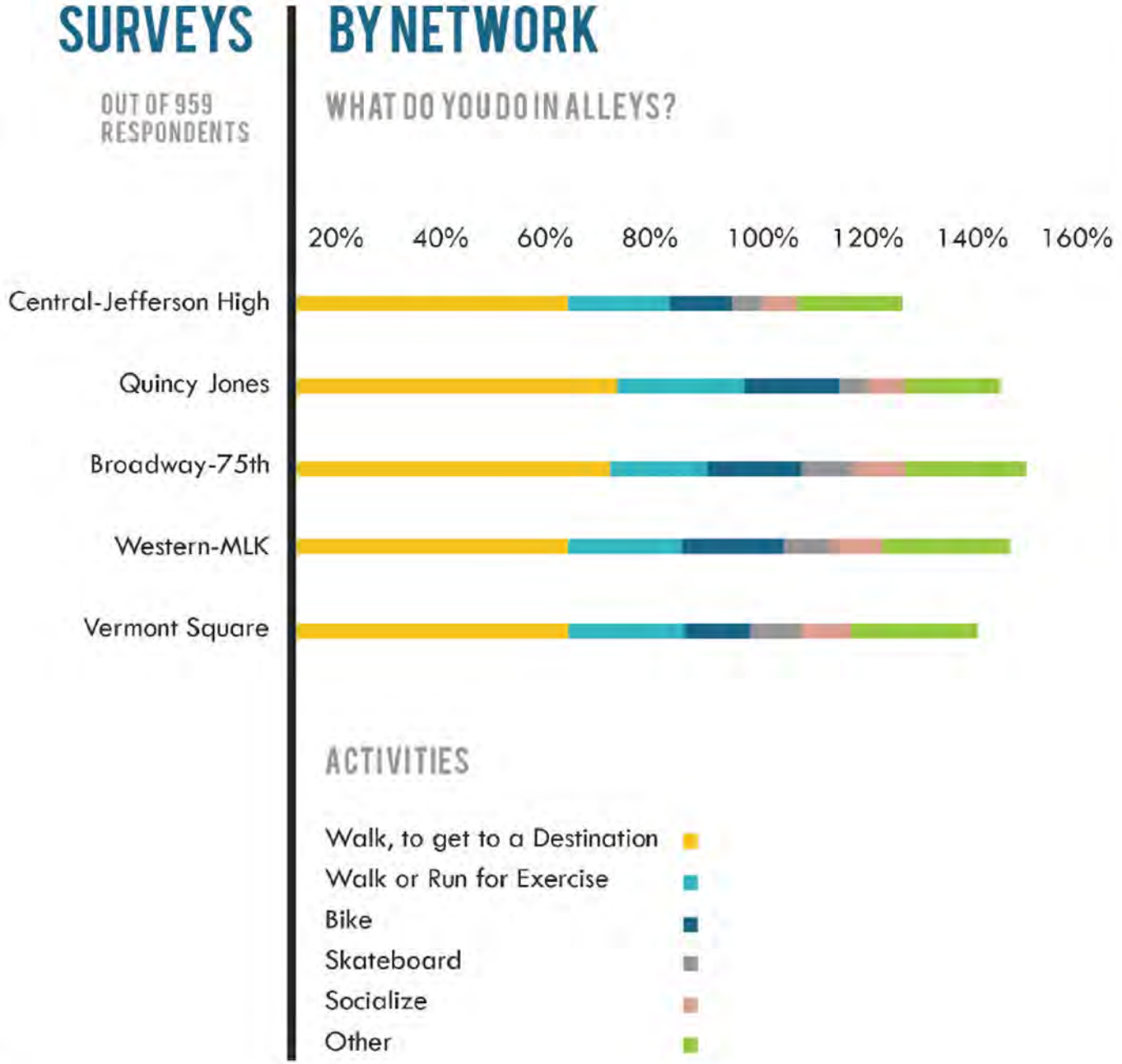


FIGURE 7.14
SURVEY RESPONSES BY NETWORK: WHAT DO YOU DO IN THE ALLEYS?





WALKING INVENTORIES

Walking inventories are a means to observe and document existing conditions in the built environment. In addition, they are a useful tool for planners to effectively engage with community members in order to collectively identify issues in the physical environment (U.S. Department of Transportation 2015). During a walking inventory, participants may be asked to complete a systematic questionnaire about the built environment. In addition, a photo inventory may be used to further engage participating community members and stakeholders. Photo inventories involve the documentation on film of special places and features as realized by community members. There are numerous benefits to including a photo inventory as part of an overall assessment of a built environment. Through photo inventories, community members of a variety of ages and linguistic abilities are able to be involved in the inventory process and communicate their visual preferences as well as what they considered to be significant (National Park Service 2002).

For this AMP, community members and stakeholders participated in a group walk in one of the priority alley networks as identified by the AMP. Within each of the networks, walking inventories were conducted in alleys near key community locations such as a local elementary school or youth center. During the inventory, community members participated in one of two tasks:

- a written inventory, and,
- a photo inventory.

The written inventory included structured questions, number ranking evaluations, as well as the opportunity to provide more information via write-in questions. For the photo inventory participants were provided with a disposable camera and asked to photograph alley features they considered to be significant as well as record a brief description of each image. The results from the written inventory, images, and any accompanying comments were archived and analyzed by network and each individual alley segment as determined by the walking inventory route.

Overall, there are some consistent patterns in the data collected from the walking inventories. When comparing conditions documented on the inventory form with participants' overall ranking of user comfort and perceived safety, the condition of the paving was the most likely indicator of user comfort. For instance, where alleys had degraded surfacing, participants were less likely to report high levels of use comfort. In addition, maintenance issues, like the presence of trash and overgrown vegetation, were likely to correspond with lower levels of perceived user comfort and safety.

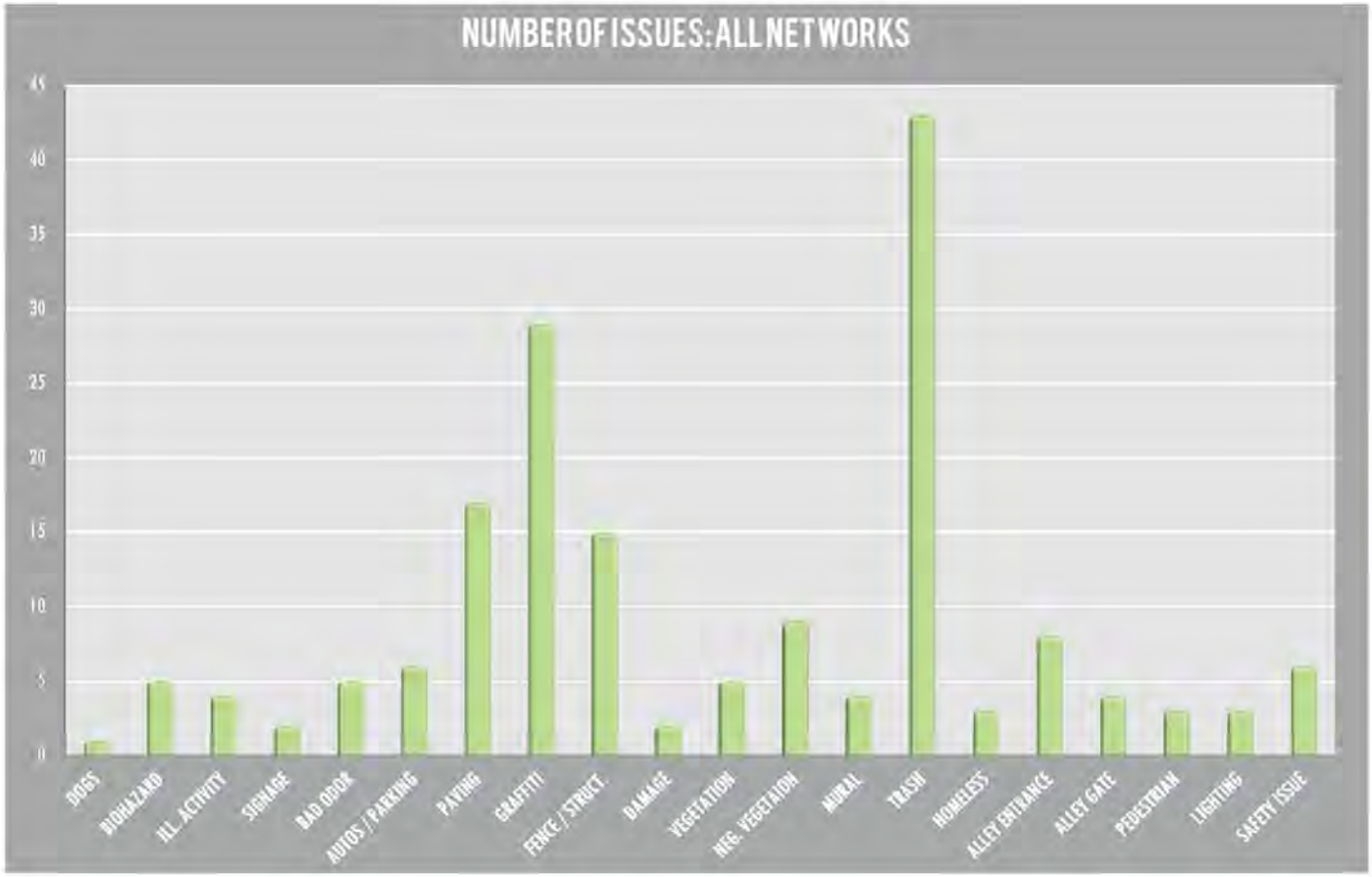
The presence of special features like art and attractive vegetation, though not

FIGURE 7.15 (TOP) AND 7.16 (BOTTOM) COMMUNITY MEMBERS PARTICIPATE IN THE WALKING INVENTORY PROCESS

often inventoried by participants, did correlate with higher levels of reported user comfort. In addition, there was a connection between an overall positive perception of the alley when conditions were more conducive to safely crossing the street between alley segments (i.e., slower traffic and drivers that yielded to participants).

In addition to the written inventory analysis, an image content analysis was conducted to determine alley features that were present in the photographs. Twenty categories of features were created and placed in a matrix alongside each image. An agreed upon threshold of not less than 80% inter-coder agreement was determined to be viable for establishing agreement amongst reviewers. With this, photos were inventoried based on thematic content.

The contents of the photos suggest that four issues were consistently raised across all alley networks. Of all photographs taken, 25% included "trash," 17% included "graffiti," 10% included "paving," and 9% included "fencing/ structures" (Figure 7.17.) In addition, initial observations of photos in each alley network separately suggest comparative differences in significant items. For example, paving is of less significance in the Western – MLK network than the overall data suggests, trash is more significant in the Quincy Jones and Central – Jefferson High networks, and alley entrances are more often highlighted in photographs from the 75th – Broadway and Vermont Square networks.



Finally the data was then evaluated collectively. Overall alley rankings indicated by the participants completing the written form were compared with the content of images captured by the photographers. In alleys that were ranked poorly for overall user comfort and perceived safety, images of trash and graffiti were more often documented by photographers. Conversely, in positively rated alleys, photographers spent more time documenting good paving conditions, fences and structures that were in good condition, and vegetation within the alley. From these responses it is clear that maintenance plays a large role in the overall perception of an alley's level of safety and comfort. In addition, vegetation can also increase a users sense of safety and comfort in an alley.

FIGURE 7.17 (ABOVE)
NUMBER OF ISSUES PHOTO-DOCUMENTED IN ALL NETWORKS



FIGURE 7.18 (RIGHT)
PAVING CONDITIONS DOCUMENTED BY A PHOTOINVENTORY PARTICIPANT



DOTMOCRACY PRIORITIZING

Dotmocracy is an established facilitation process for prioritizing ideas among a large number of people in order to recognize their collective opinions and rank a number of possible options or outcomes (Diceman 2006). During the dotmocracy process, participants are presented with a number of images to choose from. In this process, participants placed sticker dots directly on the images to indicate their preference. One of the strengths of this process as an outreach tool is that it is non-linguistic in format and therefore accessible to speakers of non-dominant languages, those with limited literacy and young children. Indeed, dotmocracy was a technique originally used in adult education settings in order to overcome literacy and language barriers in a diverse and often marginal and immigrant tenant population (Maley 2010). The process of dotmocracy does not produce a final decision, but does provide guidance and insight that can inform a project's development.

For the AMP, photos were separated by category, and each participant was given 6 dots. Participants were instructed to use each dot as a vote, and to use their votes however they saw fit. For instance, participants were told they could use one dot vote in each category, multiple dot votes in a category or even put all six dot votes on one image alone.

FIGURE 7.19
COMMUNITY MEMBERS PARTICIPATE IN THE DOTMOCRACY PRIORITIZING PROCESS

Photo categories included the following:

- Lighting: Images were chosen to cover a variety of design styles. Styles included modern light fixtures, classic light fixtures, among others. In-ground versus pole mounted lights were presented as were solar lights.
- Plants: Plant choices ranged from colorful, flowering plants to native grasses and water catchment plants. In addition, planting style (i.e., low plants, vines, etc.) were options.
- Paving: A variety of paving styles were presented, including mixes of materials, patterns, and decoration.
- Alley Character: This category presented a host of programming options (i.e., community gardening, bike friendly, fitness loop) for the alley in addition to the image options focused on the overall aesthetic of the alley (i.e., open and clear, gravel, paved).
- Art and Fencing: A number of different art mediums were represented in this category including mosaics, murals, and sculptures. In addition, a handful of fence design styles were an option.
- Signs: Within this category, various sign styles were presented. In addition, the programming of sign series options were indicated (i.e., educational or locational).

The results of the dotmocracy activities were tallied and analyzed for two areas:

- The overall categorical priorities within a network, based on the categories that were determined to be of highest priority (greater than or equal to 20% of all votes) and second highest priority (greater than or equal to 15% of all votes). The results of this analysis are reflective of design programming and interventions that should be considered and implemented network wide.
- The highest priority images (8 images out of the 36 receiving the highest number of votes) and second highest priority images (8 images out of the remaining 28 receiving the highest number of votes). The results of this analysis should guide the overall design and programming on an alley by alley basis.

The results of these analyses are described at length and priority images are presented in the remainder of this section.



FIGURE 7.20
COMPLETED DOTMOCRACY PRIORITIZING BOARD

CENTRAL-JEFFERSON HIGH NETWORK PRIORITIES


CLASSIC LIGHT FIXTURES


WATER CATCHMENT PLANTS


CHARACTER - PAVED


CHARACTER - PAVED PATHWAYS


MIX OF PAVING METHODS


MURALS



LOCATIONAL SIGNAGE


MODERN DESIGN LIGHT FIXTURES

CENTRAL-JEFFERSON HIGH NETWORK ADDITIONAL PREFERENCES


LIGHT POLE FIXTURES


TRADITIONAL BRICK


NATIVE GRASSES


SUSTAINABLE LIGHT FIXTURES


DECORATIVE PAVING PATTERNS


IN-GROUND LIGHTING


DECORATIVE FENCING


PAVING PATTERNS

CENTRAL-JEFFERSON HIGH DESIGN AND PROGRAMMING PREFERENCES

In the Central-Jefferson High Network a total of 576 sticker dots were used during dotmocracy activities which corresponds roughly to 96 people. Out of the six presented categories, greater than 20% of votes were received in the following top two categorical priorities:

- Lighting
- Paving

It is of note that the second most highly selected categories, receiving greater than or equal to 15% of all total votes, were:

- Alley Character
- Plants

In Figure 7.21, the top vote receiving images are shown as priority design preferences while the next 8 top scoring images are listed as additional design preferences. Top preferences for lighting include two distinct styles, modern and classic. The two different styles could be used to distinguish between alley design types. For instance, modern fixtures could be used in pedestrian pathways while a more classic style could be suitable in added open space areas. There is a preference for a mix of paving styles with decorative designs. The preference for locational signage could be used to create a way-finding program for the network. There is also a preference for low-growing, native grasses and shrubs.

FIGURE 7.21
CENTRAL-JEFFERSON HIGH NETWORK
DESIGN AND PROGRAMMING PREFERENCES

WESTERN-MLK DESIGN AND PROGRAMMING PREFERENCES

In the Western-MLK Network a total of 567 sticker dots were used during dotmocracy activities which corresponds roughly to 95 people. Out of the six presented categories, greater than 20% of votes were received in the following top two categorical priorities:

- Alley Character
- Plants

It is of note that the second most highly selected categories, receiving greater than or equal to 15% of all total votes, were:

- Art and Fencing
- Paving
- Lighting

In Figure 7.22, the top vote receiving images are shown as priority design preferences while the next 8 top scoring images are listed as additional design preferences. There is a preference for using the alleys as an option for running and/or biking on a designated path. Bike friendly features in alleys was also selected as a separate category. There is a strong preference for low-growing, native grasses and shrubs. Flowering plants were also indicated as preferable. Top preferences for lighting include two distinct styles, modern and classic. The two different styles could be used to distinguish between alley design types.

FIGURE 7.22
WESTERN-MLK NETWORK DESIGN AND PROGRAMMING PREFERENCES

WESTERN-MLK NETWORK PRIORITIES


WATER CATCHMENT PLANTS


IN-GROUND LIGHTING


CLASSIC LIGHT FIXTURES


PAVED PATHWAYS


MIX OF PAVING METHODS


MURALS


CHARACTER - PAVED


DECORATIVE FENCING

WESTERN-MLK NETWORK ADDITIONAL PREFERENCES


LIGHT POLE FIXTURES


MODERN DESIGN LIGHT FIXTURES


NATIVE GRASSES


LOW WALL PLANTS


CHARACTER - BIKE FRIENDLY


MOSAICS


FLOWERING PLANTS


TRANSPARENT FENCING

VERMONT SQUARE NETWORK PRIORITIES


WATER CATCHMENT PLANTS


LIGHT POLE FIXTURES



LOCATIONAL SIGNAGE


CHARACTER - PAVED PATHWAYS


MIX OF PAVING METHODS


MURALS


CHARACTER - PAVED


MODERN DESIGN LIGHT FIXTURES

VERMONT SQUARE NETWORK ADDITIONAL PREFERENCES


DECORATIVE PAVING PATTERNS


IN-GROUND LIGHTING


NATIVE GRASSES


PLANTERS


CLASSIC LIGHT FIXTURES


CHARACTER - COMMUNITY GARDENS


MOSAICS


TRANSPARENT FENCING

VERMONT SQUARE DESIGN AND PROGRAMMING PREFERENCES

In the Vermont Square Network a total of 581 sticker dots were used during dotmocracy activities which corresponds roughly to 97 people. Out of the six presented categories, greater than 20% of votes were received in the following top two categorical priorities:

- Alley Character
- Lighting

It is of note that the second most highly selected categories, receiving greater than or equal to 15% of all total votes, were:

- Art and Fencing
- Paving
- Plants

In Figure 7.23 the top vote receiving images are shown as priority design preferences while the next 8 top scoring images are listed as additional design preferences. Using the alleys as a space for running and/or biking on a designated path was selected, and murals were indicated as a high priority feature. Preferences for both community gardening and planters could be a natural pairing as a combined alley design feature. Top preferences for lighting were modern and the preferred paving type was a mix of styles with decorative designs. The preference for locational signage could be used to create a way-finding program for the network and low-growing, native grasses and shrubs were also preferred.

FIGURE 7.23
VERMONT SQUARE NETWORK DESIGN AND PROGRAMMING PREFERENCES

QUINCY JONES DESIGN AND PROGRAMMING PREFERENCES

In the Quincy Jones Network a total of 555 sticker dots were used during dotmocracy activities which corresponds roughly to 93 people. Out of the six presented categories, greater than 20% of votes were received in the following top two categorical priorities:

- Lighting
- Alley Character

It is of note that the second most highly selected categories, receiving greater than or equal to 15% of all total votes, were:

- Art and Fencing
- Plants
- Paving
- Lighting

In Figure 7.24 the top vote receiving images are shown as priority design preferences while the next 8 top scoring images are listed as additional design preferences. Top preferences for lighting include two distinct styles, modern and classic. The two different styles could be used to distinguish between alley design types- modern fixtures could be used in pedestrian pathways and a classic style could be suitable in added open space. Using the alleys as a space for running and/or biking on a designated path was selected as was community gardening. Mosaics and decorative fencing were also highly preferred.

FIGURE 7.24
QUINCY JONES NETWORK DESIGN AND PROGRAMMING PREFERENCES

QUINCY JONES NETWORK PRIORITIES


CLASSIC LIGHT FIXTURES


WATER CATCHMENT PLANTS


CHARACTER - PAVED


CHARACTER - PAVED PATHWAYS


MIX OF PAVING METHODS


DECORATIVE FENCING



LOCATIONAL SIGNAGE


MODERN DESIGN LIGHT FIXTURES

QUINCY JONES NETWORK ADDITIONAL PREFERENCES


LIGHT POLE FIXTURES


CHARACTER - COMMUNITY GARDENS


MOSAICS


FENCING


ANIMAL FENCE DESIGN


INGROUND LIGHTING


PLANTERS


PAVING PATTERNS

BROADWAY-75TH NETWORK PRIORITIES


WATER CATCHMENT PLANTS


MOSAICS



LOCATIONAL SIGNAGE


CHARACTER - PAVED PATHWAYS


MIX OF PAVING METHODS


MURALS


CHARACTER - PAVED


MODERN DESIGN

BROADWAY-75TH NETWORK ADDITIONAL PREFERENCES


TRADITIONAL BRICK


EDUCATIONAL SIGNAGE


NATIVE GRASSES


LOW WALL PLANTS


CLASSIC LIGHT FIXTURES


DECORATIVE FENCING


SCULPTURES


TRANSPARENT FENCING

BROADWAY-75TH DESIGN AND PROGRAMMING PREFERENCES

In the Broadway-75th Network a total of 511 sticker dots were used during activities which corresponds roughly to 85 people. Out of the six presented categories, greater than 20% of votes were received in the following top categorical priority:

- Art and Fencing

It is of note that the second most highly selected categories, receiving greater than or equal to 15% of all total votes, were:

- Alley Character
- Paving
- Plants
- Lighting

In Figure 7.25 the top vote receiving images are shown as priority design preferences while the next 8 top scoring images are listed as additional design preferences. Top preferences for lighting include two distinct styles, modern and classic. Using the alleys as a space for running and/or biking on a designated path was selected as was community gardening. Mosaics and decorative fencing were also highly preferred. The preference for locational signage could be used to create a way finding program for the network. In addition, the preference for low-growing, native grasses and shrubs as well as educational signage make this network ideal for interpretive programs on stormwater management.

FIGURE 7.25
BROADWAY-75TH NETWORK DESIGN AND PROGRAMMING PREFERENCES

CONCLUSION

The focus of this section is to provide detailed community outreach techniques and data results at the network scale. In years to come as the community evolves and changes, making current information outdated, these techniques may need to be repeated. In addition, the same survey techniques applied here at a larger scale should be applied to a more site specific scale, such as an individual alley. At that scale, information gathered can be used to inform alley specific designs. For instance, knowing the percentage of children living adjacent to a specific alley and what the dominant age range is, can help identify what sort of resources and design features are needed within that alley. When a green alley is reflective of the needs of its neighboring residents, it has a far greater chance of being cared for and used by its community, therefore becoming an amenity. Chapter 9 provides suggested topics to continue engagement with the community living in and around the five priority Phase I networks. In addition, these techniques can be applied to outreach activities for Phase II priority networks also identified in Chapter 9.



FIGURE 7.26
AMP PROJECT AREA
COMMUNITY MEMBERS


NETWORK



PLANNING + DESIGN

8. GREEN ALLEY NETWORK PLANNING + DESIGN

This chapter is focused on presenting design and programming guidelines for each of the five priority networks. Network masterplans identify design programming for each of the alleys based on the results of the community outreach process described in the previous chapter. In addition, because the project area is located over the LA forebay which is capable of storing and releasing large quantities of groundwater and allows percolation into deeper aquifers that replenish the groundwater basin, designs prioritize the stormwater infiltration and capture potential of each alley. If alley designs are fully realized with ¾" BMPs for each alley catchment area, this plan has the capacity to infiltrate 4,264,615 cubic feet of stormwater annually.

In addition to focusing on the stormwater infiltration capacity for each of the networks, the design responses in the network masterplan include recommendations for green alleys as open space, places for pedestrian and bicycle connections, and opportunities to cool the urban environment. In all, four general design typologies, tied directly to the project objectives and grant funding criteria, were used to guide alley design and theme recommendations:

- Stormwater Capture + Treatment,
- Urban Greening + Cooling,
- Usable Open Space, and
- Safe Connections.

In addition to the design recommendations for the alleys in the priority networks, opportunities for network-wide improvements are outlined. Network plans may suggest increased street tree canopy, green walls, and green roofs, which are an opportunity to further reduce stormwater flows and mitigate urban heat island effect. Suggested bike friendly streets, streets with a need for traffic calming measures and suggested traffic improvements are shown to promote safe connections between alleys, streets, residences, and community facilities. In addition, areas for increased park land are highlighted. Ultimately the network master plans are a holistic vision for unifying an entire neighborhood through green alley work.

It should be noted that each alley's specific design has yet to be realized. Community participation is key to the success of alley redevelopment projects. There are many complex issues that will not be resolved through alley redesign alone. Without community participation and stewardship, AMPlified alleys would quickly succumb to illegal dumping, vandalism, or other destructive behavior. Therefore, the priority alley networks of the AMP can only be fully designed when addressed in combination with extensive and ongoing community outreach where residents are involved and their concerns, needs, and hopes for the alleys in their neighborhood are expressed. Thus following the recommendations in the network master plans, topics for further community outreach are highlighted.

Chapter 9: Future Amplifications begins charting a course for implementing green alley designs and projects. However, certain City of Los Angeles requirements will need to be addressed and considered as alley designs move forward. For instance, recommendations in the Draft South Los Angeles and Draft



STORMWATER CAPTURE + TREATMENT



URBAN GREENING + COOLING



USABLE OPEN SPACE



SAFE CONNECTIONS

South East Los Angeles Community Plan Implementation Overlay Districts (CPIO) encourage and even require vehicular access into new developments along commercial corridors from side streets and alleys, where alleys are available. As decisions are made about what alley treatments should be implemented and where, the Los Angeles Department of City Planning policy planners should be consulted to ensure consistency with the recommendations and requirements of the current CPIOs.

In addition, the Los Angeles Department of Transportation (LA DOT) requires that loading occur in alleys in commercial districts. In these cases, organizations must consult with LA DOT to determine if the potential for relocating loading zones to streets would be feasible. LA DOT district engineers should also be consulted as alley designs are progressing.

The City of Los Angeles Fire Department will be another key agency to consult as projects are underway. Alleys are often required to maintain access for fire trucks, thus it will be necessary to consult the City of Los Angeles Fire Department to determine issues related to access and get feedback on selected materials.

Finally, it should be noted that if a design intends to use plantings in combination with alternative paving material, the irrigation system shall not utilize potable water except for plant establishment.

Two appendices are also provided to support green alley project development within these networks and beyond. The Alley Development Alternatives (Appendix A) includes sample BMP designs, with accompanying pictures for each, categorized according to the same four primary typologies utilized in the network master plan designs. The purpose of the Alley Design Alternatives is to provide ideas and supporting information for design workshops and stakeholder meetings, assist with the future site-specific design of alleys within the identified high priority networks, and serve as a resource for future alley projects elsewhere in Los Angeles and other cities. As green alley network development and design progresses under the guidance of the network master plans presented in this chapter, design responses can be reassessed and alternate design interventions can be selected from the table and adapted as needs and resources change. It should be noted that the Los Angeles Department of Power and Water should be consulted to determine appropriateness of each selected BMP.

Potential LID BMP Locations and Priority Network Alley Design Guides (Appendix E) includes maps showing the recommended locations for consideration of low impact development (LID) stormwater best management practices (BMPs) for the priority networks (excluding Avalon). Proposed locations for BMPs include curbside parkway planters and vegetated median swales, as well as BMPs constructed in redesigned alleys. In addition, individual alley guides for all alleys within the network are presented. Each alley guide includes alley specific design recommendations and considerations which include:

- Visibility within the alley.
- Surface material in the alley and its condition.
- Design theme included in the Network Master Plan in *Chapter 8: Green Alley Network Design*.
- Priority design typology.
- Additional design typology suitabilities.
- How ideal an alley is for infiltration BMPs.
- How ideal an alley is for flow through BMPs.
- The alley catchment area.
- Stormwater calculations related to the alley catchment area (from the GIS analysis described in *Chapter 7: Secondary Analysis and Input*).
- Local considerations like community facilities that should be consulted during designs.
- Adjacent opportunities for open space in vacant lots, infiltration in parking lots, and green roofs on large public facilities.
- Designations included in the Draft South Los Angeles and Draft South East Los Angeles Community Plan Implementation Overlay Districts (CPIO).
- Opportunities for infiltration of sheet flow from adjacent streets and parking lots.

FIGURE 8.1
ALLEY DEVELOPMENT ALTERNATIVES TYPOLOGIES

CENTRAL-JEFFERSON HIGH NETWORK MASTER PLAN

Information gleaned from extensive stormwater analysis helped drive specific design goals within this network. From these results and in combination with the priority design and programming preferences determined during community outreach, a Network Master Plan was derived. Goals addressed in this Network Master Plan include:

- Increasing stormwater management opportunities network wide.
- Increasing access to open space and recreation through the creation of eight new parks on currently vacant lots.
- Increasing bicycle infrastructure through AMP proposed bike friendly streets not currently identified in the Los Angeles

FIGURE 8.2
CENTRAL-JEFFERSON HIGH NETWORK MASTER PLAN



Department of City Planning 2010 Bicycle Plan.

- Increasing pedestrian infrastructure through traffic calming measures, a pedestrian focused fitness loop, and pedestrian focused improvements in key alleys.
- Increasing access to open space and green alleys by addressing safety concerns through design interventions.
- Improving a sense of community identity through a wayfinding program and an alley art walk.

To address these network specific goals, the following design features are recommended:

- A mix of paving, paving decorations, and lighting styles to unify the fitness loop. Mile markers and signage can be used to support physical activities within the loop.
- A mix of paving and paving decorations and lighting styles to unify the art walk where community based murals are the focus.
- Low growing plants and modern or classic light fixtures are used to maintain open sight lines and increase visibility at night.
- Multi-lingual locational signage directing residents to community and bike facilities (parking, lanes, etc.) lends character and unity to the network as a whole.
- Murals, mosaics, and decorative fencing should be used in alleys and new parks.

This proposed design works to envision streets, alleys, and public infrastructure as a system that works together to improve the quality of life of residents and serve community needs. In order to continue to engage residents on green alleys as these projects evolve within their neighborhoods, a series of network related design decisions should be explored in conjunction with community member input as these projects move forward. Specific topics for further community involvement in the Central-Jefferson High network are listed here:

- Network branding for locational signage and determination of key locations to identify in a wayfinding program.
- Input on design themes for murals, mosaics, and decorative fencing.
- Selection of physical activity signage and equipment where appropriate.
- Input on paving design patterns.

Suggestions on activities and tools that can be used to engage the community can be found in the *Next Steps* section of *Chapter 9: Future Amplifications*.

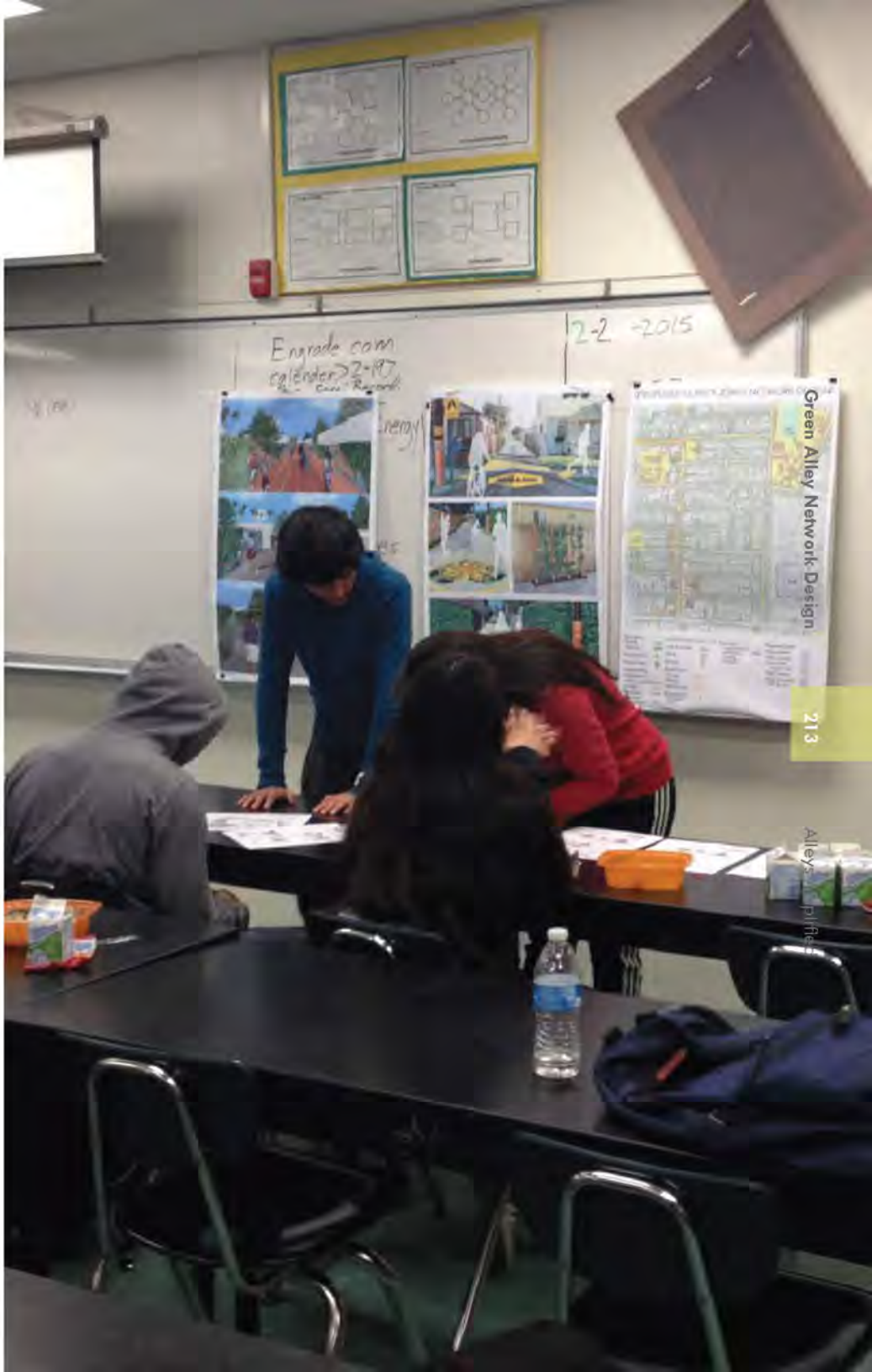
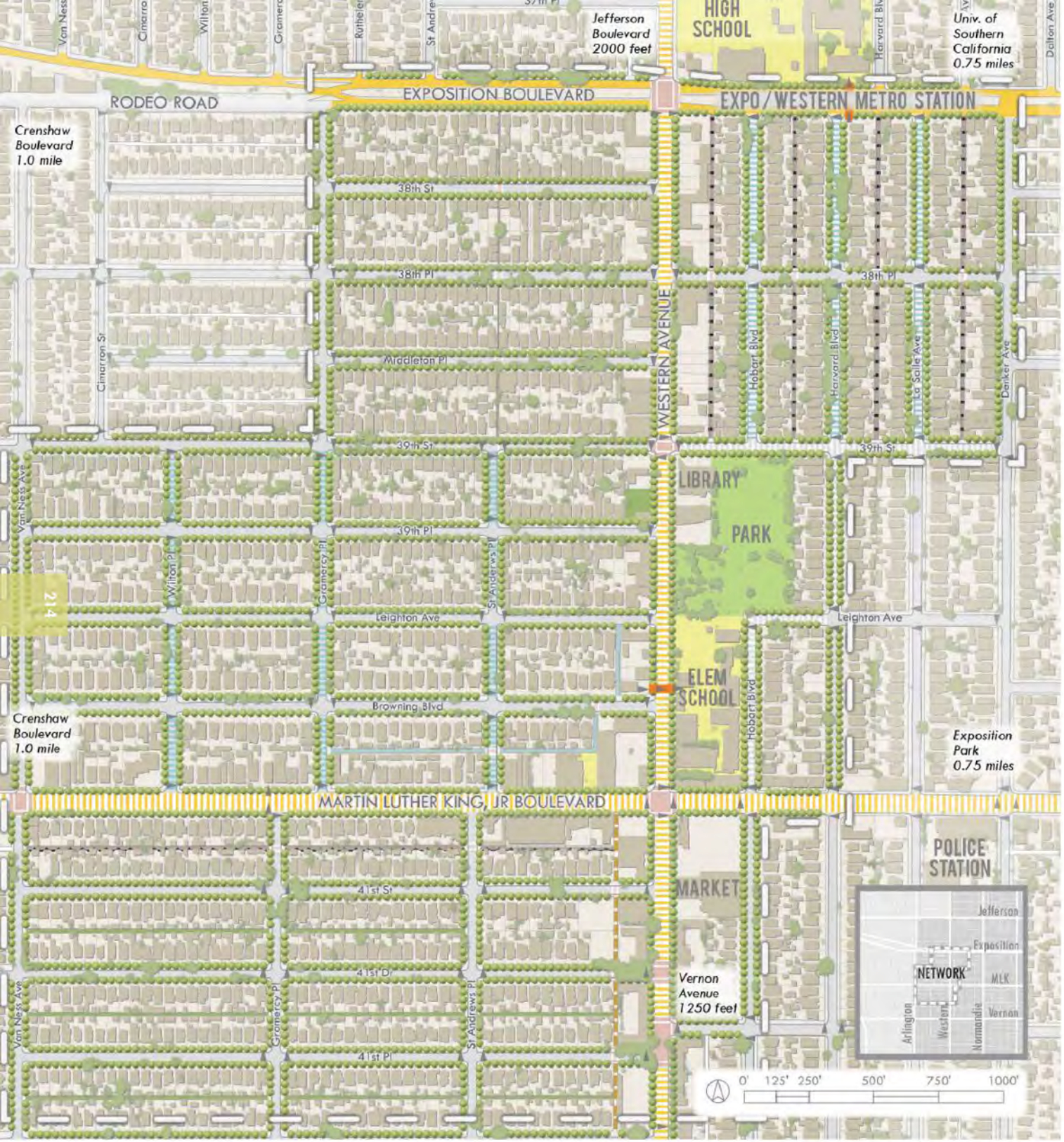


FIGURE 8.3
STUDENTS AT JEFFERSON HIGH SCHOOL REVIEW PROPOSED NETWORK DESIGN



WESTERN-MLK NETWORK MASTER PLAN

Information gleaned from extensive stormwater analysis helped drive specific design goals within this network. From these results and in combination with the priority design and programming preferences determined during community outreach, a Network Master Plan was derived. Goals addressed in this Network Master Plan include:

- Increasing tree canopy within the alleys and network wide.
- Increasing stormwater management opportunities network wide.
- Increasing pedestrian infrastructure through traffic calming measures and a pedestrian focused fitness loop.
- Reinforcing the unique character of the

FIGURE 8.4
WESTERN-MLK NETWORK MASTER PLAN



neighborhood by creating an alley art walk.
- Increasing access to open space and green alleys by addressing safety concerns through design interventions.
- Increasing bicycle infrastructure through AMP proposed bike friendly streets not currently identified in the Los Angeles Department of City Planning 2010 Bicycle Plan.

To address these network specific goals, the following design features are recommended:

- A mix of paving, paving decorations, and lighting styles to unify the fitness loop. Mile markers and signage can be used to support physical activities within the loop.
- Bicycle infrastructure improvements on streets and in alleys network wide.
- A mix of paving, paving decorations, and lighting styles to unify the art walk where community based murals are the focus.
- Low growing plants and modern or classic light fixtures are used to maintain open sight lines and increase visibility at night.
- Flowering plants should be chosen whenever possible.
- Multi-lingual locational signage directing residents to community and bike facilities (parking, lanes, etc.) lends character and unity to the network as a whole.
- Murals, mosaics, and decorative fencing should be used in alleys and new parks.

This proposed design works to envision streets, alleys, and public infrastructure as a system that works together to improve the quality of life of residents and serve community needs. In order to continue to engage residents on green alleys as these projects evolve within their neighborhoods, a series of network related design decisions should be explored in conjunction with community member input as these projects move forward. Specific topics for further community involvement in the Western-MLK Network are listed here:

- Input on design themes for murals, mosaics, and decorative fencing.
- Input on paving design patterns.
- Selection of physical activity signage and equipment where appropriate.
- Types of street trees to be planted.
- Network branding for locational signage and determination of key locations to identify in a wayfinding program.

Suggestions on activities and tools that can be used to engage the community can be found in the *Next Steps* section of *Chapter 9: Future Amplifications*.



FIGURE 8.5
STORMWATER CAPTURE AND TREATMENT TYPOLOGY EXAMPLE

VERMONT SQUARE NETWORK MASTER PLAN

Information gleaned from extensive stormwater analysis helped drive specific design goals within this network. From these results and in combination with the priority design and programming preferences determined during community outreach, a Network Master Plan was derived. Goals addressed in this Network Master Plan include:

- Increasing perceived safety in the alleys and open space areas.
- Increasing pedestrian infrastructure through traffic calming measures and a pedestrian focused fitness loop and art walk.
- Reinforcing the unique character of the neighborhood by creating an alley art

FIGURE 8.6
VERMONT SQUARE NETWORK MASTER PLAN



- Increasing access to open space in alleys. In addition, two vacant lots can become additional park space or community gardens and Budlong Avenue between 47th Street and 48th Street could be closed to accommodate a pedestrian plaza.

To address these network specific goals, the following design features are recommended:

- A mix of paving, paving decorations, and lighting styles to unify the fitness loop. Mile markers and signage can be used to support physical activities within the loop.
- A mix of paving, paving decorations, and lighting styles to unify the art walk where community based murals are the focus.
- Urban agriculture focused alleys keep in theme with community preferences for community gardening and planters.
- Designs use low growing plants and modern or classic light fixtures to maintain open sight lines and increase visibility at night.
- Multi-lingual locational signage directing residents to community and bike facilities (parking, lanes, etc.) lends character and unity to the network as a whole.
- Murals, mosaics, and decorative fencing should be used in alleys and new parks.

This proposed design works to envision streets, alleys, and public infrastructure as a system that works together to improve the quality of life of residents and serve community needs. In order to continue to engage residents on green alleys as these projects evolve within their neighborhoods, a series of network related design decisions should be explored in conjunction with community member input as these projects move forward. Specific topics for further community involvement in the Vermont Square Network are listed here:

- Network branding for locational signage and determination of key locations to identify in a wayfinding program.
- Input on design themes for murals, mosaics, and decorative fencing.
- Selection of physical activity signage and equipment where appropriate.
- Types of fruit trees and productive vines to be planted in urban agriculture alleys.

Suggestions on activities and tools that can be used to engage the community can be found in the *Next Steps* section of *Chapter 9: Future Amplifications*.

It is of note that numerous improvements will be completed just north of the Vermont Square Network along Vermont Avenue by LA DOT including curb ramp repairs and installations. Projects are slated for implementation as early as 2017. More information on these plans can be located here: http://www.catc.ca.gov/programs/ATP/2014_Project_Applications/0435_Los_Angeles.pdf.



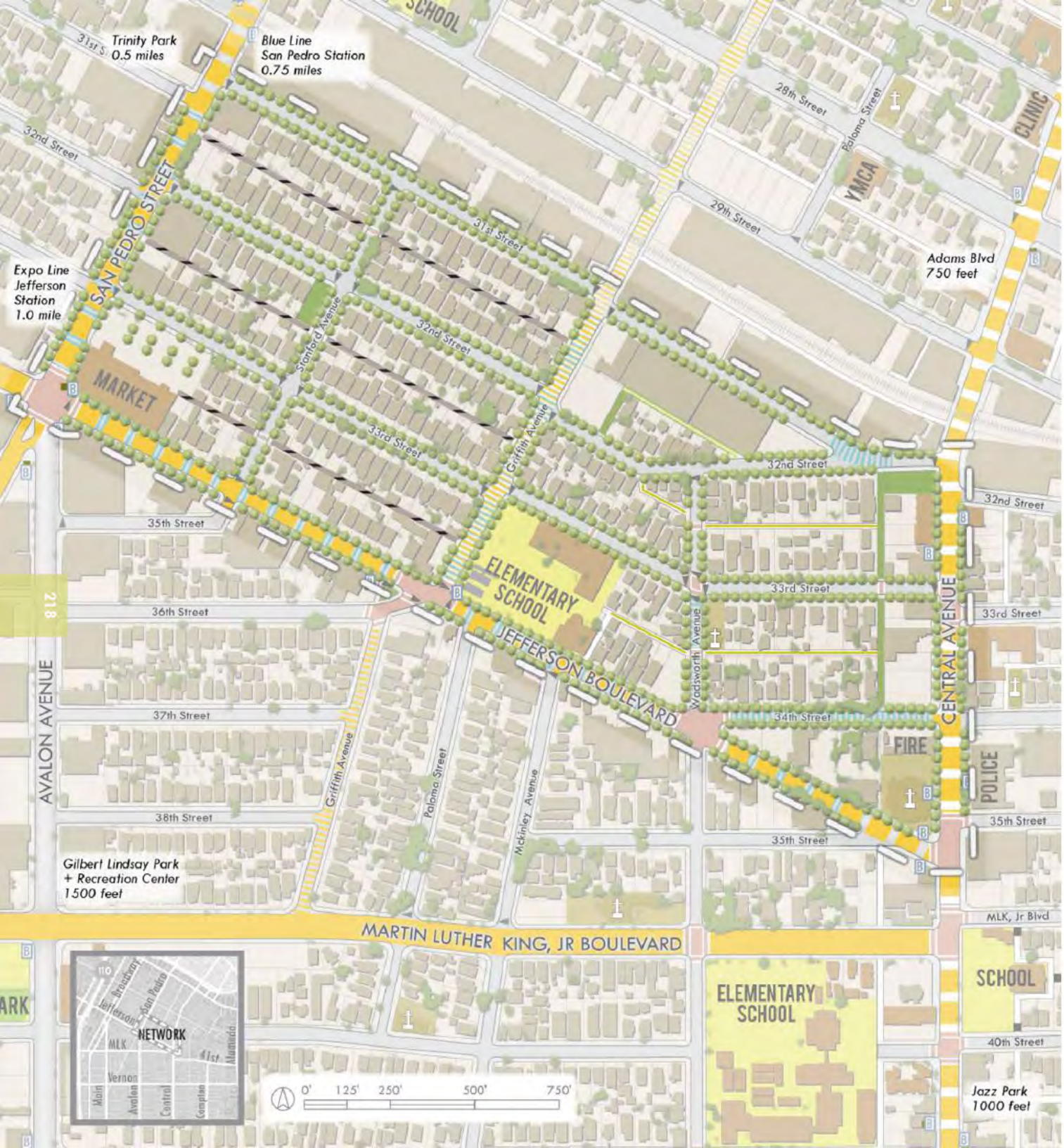
FIGURE 8.7
SAFE CONNECTIONS TYPOLOGY EXAMPLE

QUINCY JONES NETWORK MASTER PLAN

Information gleaned from extensive stormwater analysis helped drive specific design goals within this network. From these results and in combination with the priority design and programming preferences determined during community outreach, a Network Master Plan was derived. Goals addressed in this Network Master Plan include:

- Increasing pedestrian infrastructure through traffic calming measures and a pedestrian focused fitness loop.
- Increasing access to open space and green alleys by addressing safety concerns through design interventions. In addition, two vacant lots can become additional park space or community gardens.

FIGURE 8.8
QUINCY JONES NETWORK MASTER PLAN



To address these network specific goals, the following design features are recommended:

- A mix of paving, paving decorations, and lighting styles to unify the fitness loop. Mile markers and signage can be used to support physical activities within the loop.
- Urban agriculture focused alleys keep in theme with community preferences for community gardening.
- Designs use low growing plants and modern or classic light fixtures to maintain open sight lines and increase visibility at night.
- Multi-lingual locational signage directing residents to community and bike facilities (parking, lanes, etc.) lends character and unity to the network as a whole.
- Mosaics and decorative fencing should be used in alleys and new parks.
- A mix of classic and traditional lighting styles are used throughout the network to define alley design types.

This proposed design works to envision streets, alleys, and public infrastructure as a system that works together to improve the quality of life of residents and serve community needs. In order to continue to engage residents on green alleys as these projects evolve within their neighborhoods, a series of network related design decisions should be explored in conjunction with community member input as these projects move forward. Specific topics for further community involvement in the Quincy Jones Network are listed here:

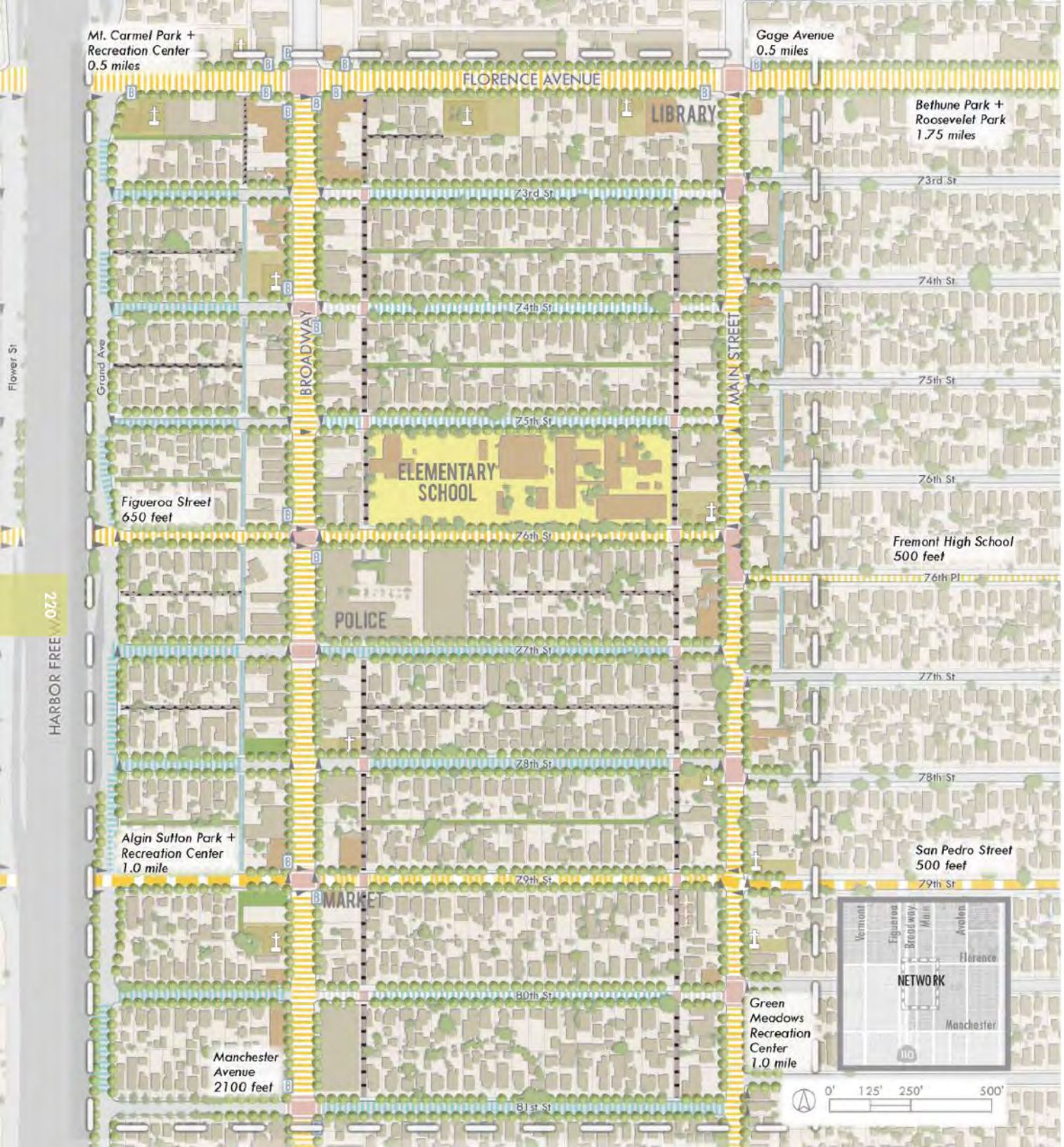
- Input on design themes for mosaics and decorative fencing.
- Network branding for locational signage and determination of key locations to identify in a wayfinding program.
- Types of fruit trees and productive vines to be planted in urban agriculture alleys.
- Selection of physical activity signage and equipment where appropriate.
- Input on paving design patterns.

Suggestions on activities and tools that can be used to engage the community can be found in the *Next Steps* section of *Chapter 9: Future Amplifications*.

It is of note that numerous improvements will be completed in the Quincy Jones Network by LA DOT including traffic calming measures such as mid-block curb extensions and speed bumps around Quincy Jones Elementary School. Projects are slated for implementation as early as 2017. More information on these plans can be located here: http://www.catc.ca.gov/programs/ATP/2014_Project_Applications/0434_Los_Angeles.pdf

FIGURE 8.9
URBAN COOLING TYPOLOGY EXAMPLE





BROADWAY-75TH NETWORK MASTER PLAN

Information gleaned from extensive stormwater analysis helped drive specific design goals within this network. From these results and in combination with the priority design and programming preferences determined during community outreach, a Network Master Plan was derived. Goals addressed in this Network Master Plan include:

- Increasing access to open space and recreation through the creation of two new parks on currently vacant lots and two new parklets in existing alleys.
- Increasing bicycle infrastructure through AMP proposed bike friendly streets not currently identified in the Los Angeles Department of City Planning 2010 Bicycle Plan.

FIGURE 8.10
BROADWAY-75TH NETWORK MASTER PLAN



- Increasing pedestrian infrastructure through traffic calming measures and a pedestrian focused fitness loop.
- Increasing access to open space and green alleys by addressing safety concerns through design interventions.

To address these network specific goals, the following design features are recommended:

- A mix of paving to unify the fitness loop. Mile markers and signage can be used to support physical activities within the loop.
- Educational signage and further space for physical activity should be included as part of a stormwater demonstration loop. Educational signage on water management in the parklet at the terminus of the western stormwater loop is recommended.
- To increase perceived safety in the alleys, designs use low growing plants and modern light fixtures to maintain open sight lines and increase visibility at night.
- Multi-lingual locational signage directing residents to community and bike facilities (parking, lanes, etc.) lends character and unity to the network as a whole.
- Murals, mosaics, and decorative fencing should be used in alleys and new parks/ parklets.

This proposed design works to envision streets, alleys, and public infrastructure as a system that works together to improve the quality of life of residents and serve community needs. In order to continue to engage residents on green alleys as these projects evolve within their neighborhoods, a series of network related design decisions should be explored in conjunction with community member input as these projects move forward. Specific topics for further community involvement in the Broadway-75th Network are listed here:

- Network branding for locational signage and determination of key locations to identify in a wayfinding program.
- Input on design themes for murals, mosaics, and decorative fencing.
- Selection of physical activity signage and equipment where appropriate.

Suggestions on activities and tools that can be used to engage the community can be found in the *Next Steps* section of *Chapter 9: Future Amplifications*.

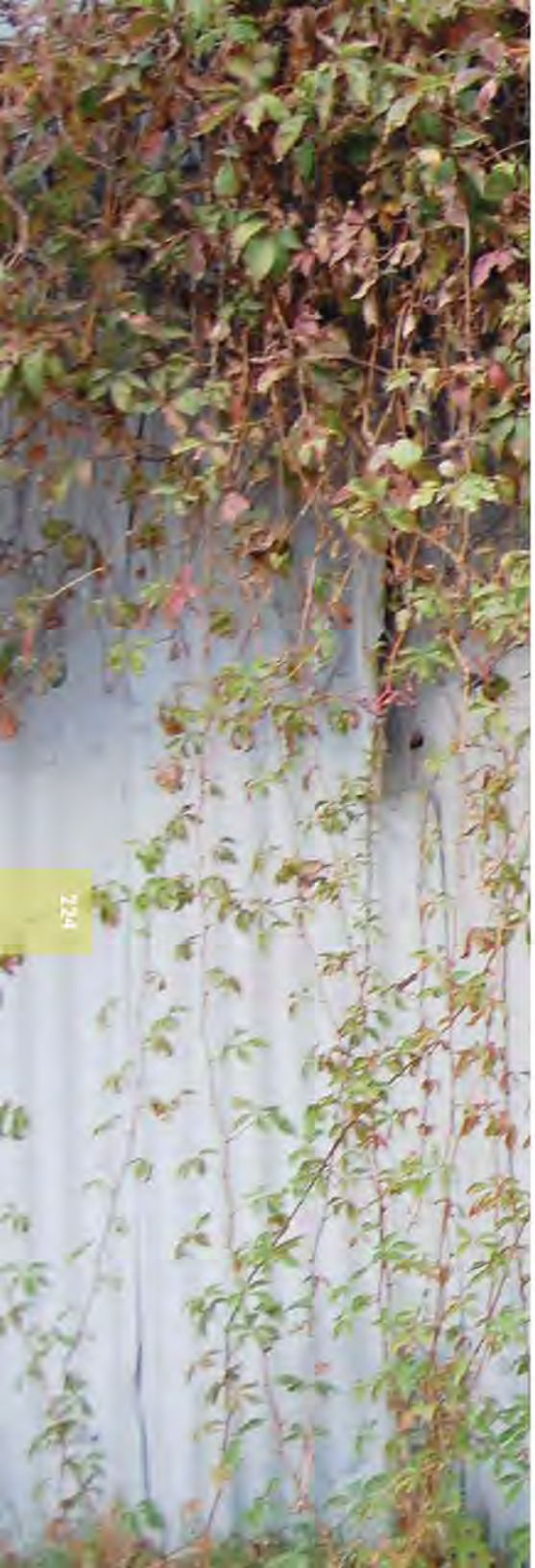


FIGURE 8.11
USABLE OPEN SPACE TYPOLOGY EXAMPLE



FUTURE AMPLIFICATIONS





9. FUTURE AMPLIFICATIONS

9-A. POLICY BARRIERS, OPPORTUNITIES, + RECOMMENDATIONS

Green alleys programs and polices vary fairly significantly throughout the United States. While some cities have formalized green alleys programs, many either include green alleys in larger green street policies or guidelines, or green alleys are supported through related policies. In the case of Los Angeles, green alleys are supported in both manners - through specific, related policies and also more general stormwater management requirements and guidance. The Los Angeles Department of City Planning has Green Streets Policy which supports green alleys work and has a focus on urban runoff and water issues. Los Angeles, as is the case in many cities, views green infrastructure related program through the lens of water impacts and with a general focus on low impact development. A key component for making green alleys become a reality is to understand Los Angeles' existing green infrastructure related policy and where new policy and/or incentives are needed. This section includes a summary of a two part study used to:

1. Identify and review the City of Los Angeles' existing policy and codes that support or present barriers to green infrastructure and AMP project objectives, and;
2. Identify gaps in existing policy and make recommendations for new policy and incentives that support green infrastructure.

This policy review focused on seven topics related to completing green alley projects. The framework for this review was borrowed from the United States Environmental Protection Agency (EPA), where questions were presented then answered through the lens of Los Angeles' existing policy. The initial questions were informed by the EPA's 2013 evaluation of green infrastructure barriers and opportunities in Phoenix, Arizona, which involved the use of two existing tools (Tetra Tech's Green Infrastructure Opportunity Checklist Tool and the EPA Water Quality Scorecard) (US EPA 2013). In addition, the Green Infrastructure Identification of Barriers and Opportunities Checklist Tool, a Los Angeles specific adaptation of Tetra Tech's Green Infrastructure Opportunity Checklist Tool (Council for Watershed Health 2013) was consulted. Both the EPA Water Quality Scorecard and the Green Infrastructure Identification of Barriers and Opportunities Checklist Tool are included in the appendices of this document, Appendix L.

Derived from the aforementioned tools, four pertinent topics were selected:

1. Minimizing effective or connected impervious areas
2. Restore and enhance the hydraulic function of unpaved areas
3. Harvest rain to enhance potable and non-potable water supply
4. Allow and encourage multi-use sotrmwater controls

Following the inclusion of the first four topics, an additional three topics identified as key components for the implementation and success of green alleys in the South Los Angeles Area were added. These are:

1. Alley gating, access, and decommissioning
2. Urban agriculture and healthy food
3. Green alley maintenance

FIGURE 9.1
ALLEY VEGETATION

Beyond identifying Los Angeles' existing policy and codes, and making it readily available in the South Los Angeles Green Alleys Master Plan (AMP), the second purpose of this study was to identify gaps in existing policy and make recommendations for new policy and incentives that support green alley projects.

In Policy Analysis and Recommendations A full discussion of the seven identified topics, issues, and findings is included in (Appendix B) provides insight on how these topics relate to greening of South Los Angeles' alleyways. Each key topic is further explored through key questions that pertain directly to the implementation of green alley work. Findings from existing City of Los Angeles policy and codes as they relate to those key questions is included and suggestions for policy expansions and additions are included and prioritized in terms of their applicability to green alley work. Included in this section is a summary of recommended policy expansions and additions considered essential to completing green alley development projects.

PRIORITY POLICY EXPANSIONS

The AMP recommends expanding upon existing policy in order to support green alley implementation. While a full listing of related policy and recommendations is included in Appendix B, priority policies for consideration are as follows:

- Expand language in the LID Standards Manual to include alleys as part of the 'various settings' where biorentention areas can be applied.
- Expand language in the LID Standards Manual to specify alleys as "various setting" where landscaped and/or bioretention areas are allowed.
- Expand language in the LID Standards Manual to include green alley development as credit towards open space development requirements. Further, incentivize developers to create alley open space in underserved communities that are park poor with few transportation options and incentivize developers to create networks of connected spaces that facilitate active transportation and recreation.
- Include alleys in the LID BMP Handbook as designated landscape areas where listed BMPs can be applied.
- Expand City of Los Angeles Municipal Code to designate green alleys as open space.

POLICY GAPS

Gaps in existing policy allow for the opportunity for the creation of new policy and programs that are supportive of green alley projects. Areas where additional policy could be added are as follows:

- Explore integrated management models to facilitate a more coordinated approach to building and maintaining green alleys and other green infrastructure projects. An outcome could be formalizing the existing green streets committee structure to carry out this role.
- City of Los Angeles to adopt Green Infrastructure Design Guidelines for alleys, thereby expanding the Bureau of Street Services' responsibility of street tree and parkway and median vegetation maintenance to include alleys.

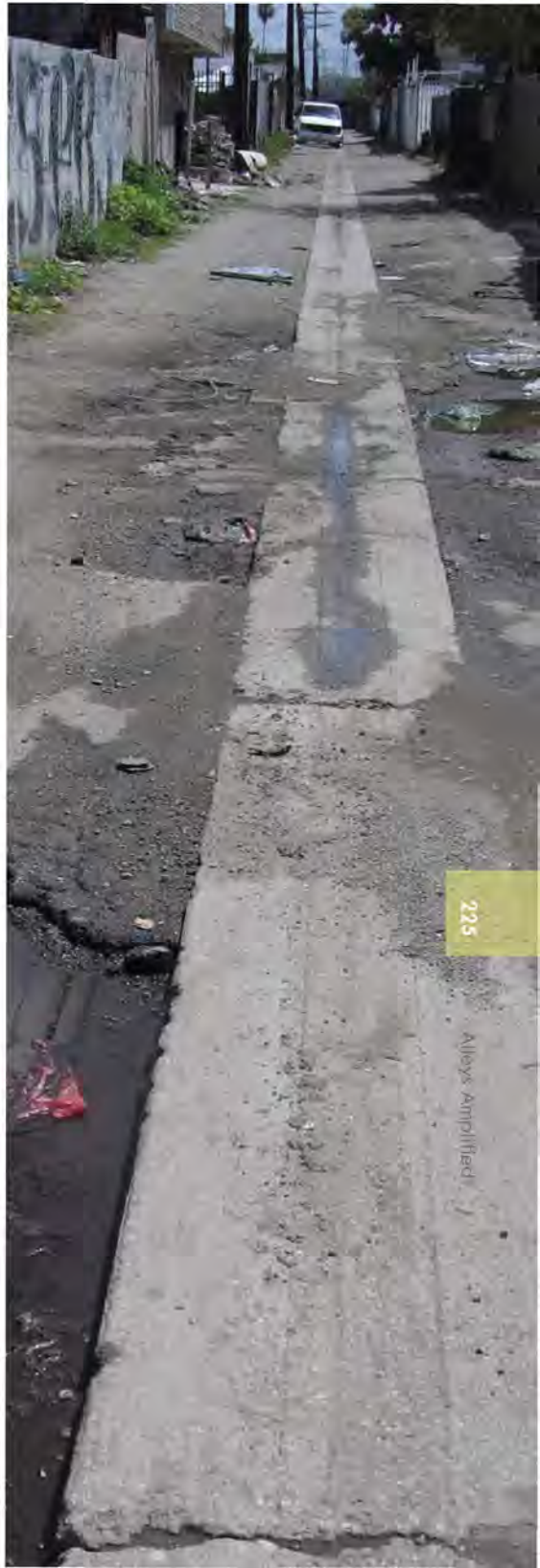


FIGURE 9.2
AN ALLEY IN THE SOUTH PARK AREA

The AMP builds the context for green alley redevelopment in South Los Angeles based on an inventory of existing conditions and input received through outreach from the stakeholders and community members who will most directly be affected by its design, implementation, and outcomes. The AMP also developed a process for analyzing the project area conditions in order to identify the networks with the greatest potential to positively impact stormwater runoff volume and quality, park poverty, and community connections. This network selection process utilized models to score and rank each of the 68 potential networks within the 18 square mile project area.

Six networks were selected as the highest-priority Phase I networks. One of those networks, Avalon, is currently a demonstration project headed by The Trust for Public Land. To date, the Avalon Green Alley Demonstration Project has involved neighbors through design workshops, neighborhood meetings, and informal social events in bilingual settings in order to arrive at conceptual site designs. The Trust for Public Land's current work on the Avalon Green Alley Demonstration Project should be used as a precedent for conducting community outreach and section 9-C of this chapter discusses outreach strategies used further. Currently, funding has been secured for construction for two alley segments within the Avalon Green Alley Demonstration Project.

The other five high-priority networks – Western-MLK, Vermont Square, Quincy Jones, Central-Jefferson High, and Broadway-75th – should be the next areas of focus for green alley network development. The research, analysis, design and outreach, and recommendations laid out in this document provide a road map for future alley specific designs and a continued program of community engagement in order to build stewardship groups for completed alleys. Specific outreach activities that should occur as each network moves toward completion are outlined later in this chapter (see section 9-C. Next Steps). In addition, in order to support green alley network implementation, potential funding opportunities are outlined later in this section.

Once the visions have been realized for these six networks, the work of the AMP may continue. Green alley networks focus on a collection of small spaces by creating multiple interventions that have the potential to make extensive changes when combined. Likewise, the City of Los Angeles will benefit from a citywide aggregate of green street and alley networks working together to distribute their benefits throughout the wider area. The AMP envisions these networks serving as catalysts for change within the communities in which they are implemented. Since the network boundaries are flexible, these first six networks have the potential to expand beyond their initial reach, with new green alleys and streets being developed at their periphery. The AMP's network selection process assigned scores to all of the 68 possible networks, as listed in Appendix F,
so that after these first six networks are developed, there are still 62 more networks within the South Los Angeles project area that could support green infrastructure.

The next phase of green alley networks to be redeveloped should include the networks that have the greatest potential for resulting in multiple benefits. The AMP network selection system described in *Chapter 4: Network Selection* scores and ranks alley networks based on their potential to address four key categories of concern: stormwater runoff volume, stormwater pollution levels, park poverty, and community connections. Those networks that have the potential to provide multiple benefits scored the highest in this system and are recommended for priority funding and design. Following this system, the networks to be redeveloped in Phase II (see Appendix F Network Selection Scores) would be:

#34 – East of Central Avenue, around Central Park.

#59 – Between Main Street and Avalon Boulevard, south of Slauson Avenue, near the Slauson-Wall Park Project.

#6 – Along either side of Western Avenue, between Jefferson and Exposition Boulevards.

#27 – East and west of Vermont Avenue, south of Slauson Avenue.

#56 – Between the Slauson Recreation Center and Augustus Hawkins Nature Center.

#49 – Between Avalon Boulevard and Central Avenue, south of Vernon Avenue, in the immediate vicinity of Carver Middle School.

These six Phase II networks received scores of 3 or higher (on scales of 1 to 5) in all four network selection models, and therefore exhibit high potential for addressing stormwater runoff volume, stormwater pollution levels, access to open space and recreation, and connections in the community for pedestrians and bicyclists. The boundaries of potential alley networks were drawn as a means to focus analysis and describe site potential. During the process of continuing network inventory and analysis, the network boundaries should be reevaluated and potentially revised to best reflect actual conditions, as was done for the five priority networks described in *Chapter 6: Priority Network Analysis*.

After the second phase of green alley networks are completed, should funding and community and political support be available, green alley redevelopment should continue further to redevelop the next set of networks that can provide multiple benefits. At that time, the AMP recommends reassessing the project area conditions to ensure the selection

model is still relevant. As green alley redevelopment itself brings positive impacts to the neighborhoods and as those benefits spread to surrounding areas, it is possible that these changes in infrastructure will render the selection model results produced at this time obsolete. New models may need to be developed, and the inputs and outputs will likely be different from the current data.

South Los Angeles contains 14% of the City's alleys. Therefore when green alley network projects have been completed for this area, there are still numerous opportunities to develop AMPs to serve local communities throughout the rest of Los Angeles.



FIGURE 9.3
PHASE II OF GREEN ALLEY NETWORKS

PROJECT ELEMENT COST ESTIMATE TABLE		UNIT	COST/UNIT
HARDSCAPING	Permeable Paving	Sq. Ft.	$25.00
	Pervious Pavers	Sq. Ft.	$30.00
	High Albedo Surfacing (*Concrete, Etc.*)	Sq. Ft.	$15.00
	Decorative Paving	Sq. Ft.	$20.00
	Open Grid Pavers	Sq. Ft.	$15.00
STORMWATER MANAGEMENT BMPS	Storm Drain Filter	Each	$7.00
	Storm Drain Inlet Screen	Each	$500.00
	Infiltration/Flow Through Planter/ Parkway Drain/Stormwater Planter Curb (*Not Including Landscaping*)	Each	$6,640.00
	Infiltration Trench/French Drain/ Trench Drain	Linear Ft.	$460.00
	Dry Well	Each	$8,00.00 - $60,00.00
	Rain Barrel	Each	$80.00 - $500.00
	Cistern (*Above Ground*)	Each	$1,000.00 - $3,500.00
	Portable Flow Meter	Each	$3,000.00
LANDSCAPING	Vegetated Swale/Rain Gardens	Sq. Ft.	$15.00
	Trees	Each	$500.00
	Plants and Mulch	Sq. Ft.	$11.00
	Green Walls	Sq. Ft.	$80.00 - $200.00
FURNISHINGS	Bench	Each	$4,547.00
	Bollard	Each	$1,200.00
	Fitness Station	Each	$35,000.00
	Gateway/Entrance	Each	$50,000.00
	Shade Structure	Each	$30,000.00
	Shade Sail	Each	$15,000.00 - $20,000.00
	Trash Receptacle	Each	$3,790.00
	Decorative Gate	Each	$30,000.00
	Drinking Fountain	Each	$12,884.00
	Convex Mirror	Each	$50.00 - $200.00
	Security Camera	Each	$7,000.00
	Emergency Call Box (*Wall Mount, Pole*)	Each	$500.00 - $3,500.00
	Decorative Fencing	Linear Ft.	$379.00
	Art Element (*Mural, Sculpture, Etc.*)	Each	$5,000.00
	Signage	Each	$2,500.00
	Bike Rack	Each	$3,790.00
	Striping on Asphalt (*Intersection Crossing, Bike Lanes, Etc.*)	Linear Ft.	$1.50
	Light Fixture	Each	$14,400.00
	Community Garden Bed	Linear Ft.	$76.00

TABLE 9.4
PROJECT ELEMENT COST ESTIMATE TABLE

9-C. FUNDING, MONITORING + EVALUATION

POTENTIAL ALLEY COSTS

Alley design responses can range from relatively low cost interventions, like striping on existing asphalt for hopscotch or a fitness trail, to relatively high cost retrofits for designs that include more intensive stormwater BMPs such as an in-ground cistern or dry well. Potential costs for the alley design features indicated in the network master plans as well as in the Alley Development Alternatives (Appendix A) are presented in this section (Table 9.4). The cost estimates for project elements were derived from bid proposals from a variety of contractors on alley redevelopment and open space projects within the City of Los Angeles. In addition, a construction management firm was consulted in order to verify these estimates. While prices for certain elements can change given availability and demand, this table can serve as a general guide for determining costs for the redevelopment of alley networks.

GRANT FUNDING OPPORTUNITIES

There are a number of grants that could support green alley projects and activities. Table 9.5 illustrates potential grant funding by the design typologies applied in Chapter 8 as well as for alley greening activities. The categories covered are:

- Urban Greening and Cooling
- Stormwater Capture and Treatment
- Usable Open Space
- Safe Connections
- Community outreach
- Management and maintenance

A full listing of potential grants, their requirements and limitations, is available in Appendix C, Potential Green Alley Project Funding Sources. Information in Appendix C includes:

- Application windows and timelines Potential funding amounts
- Types of specific elements that can be funded by grant dollars
- Information on matching fund requirements if any
- Information on requirements for applying agencies if any
- Links to more information

POTENTIAL GREEN ALLEY FUNDING SOURCES BY FUNDING POTENTIAL	
URBAN GREENING + COOLING	California Coastal Conservancy – Climate Ready Grants
	National Fish and Wildlife Foundation – Environmental Solutions for Communities Grants
	California Strategic Growth Council – Environmental Enhancement and Mitigation Grants
	United States Forest Service – National Urban Community Forestry Advisory Council Grants
	CalFire – Urban and Community Forestry Program GHG Reduction Fund Grants
	National Science Foundation – Environmental Sustainability Program Grants, PD-14-7643
	Prospective Funding: California Prop. 1 Water Quality, Supply, and Infrastructure Improvement Act of 2014
	California Strategic Growth Council – Affordable Housing and Sustainable Communities Grants
STORMWATER CAPTURE + TREATMENT	California Coastal Conservancy – Climate Ready Grants
	California Strategic Growth Council – Affordable Housing and Sustainable Communities Grants
	California Strategic Growth Council – California River Parkways
	Evironmental Protection Agency – Urban Waters Small Grants
	National Fish and Wildlife Foundation – Five Star and Urban Waters Restoration Grant Program
	United States Forest Service – National Urban Community Forestry Advisory Council Grants
	State Water Resources Control Board – Clean Beaches Initiative Grant Program, DROPS
	Prospective Funding: California Prop. 1 Water Quality, Supply, and Infrastructure Improvement Act of 2014
USABLE OPEN SPACE	California Strategic Growth Council – Environmental Enhancement and Mitigation
	CalFire – Urban and Community Forestry Program GHG Reduction Fund Grants
	California Strategic Growth Council – Affordable Housing and Sustainable Communities Grants
	National Park Service – Land and Water Conservation Fund Grants
	National Fish and Wildlife Foundation – Environmental Solutions for Communities Grants
	Prospective Funding: California Prop. 1 Water Quality, Supply, and Infrastructure Improvement Act of 2014
SAFE CONNECTIONS	CalRecycle – Illegal Disposal Site Abatement Grant Program
	National Park Service – Land and Water Conservation Fund Grants
	California Strategic Growth Council – Affordable Housing and Sustainable Communities Grants
	CalTrans – Sustainable Transportation Planning Grants
	CalTrans & Safe Routes to Schools National Partnership – Active Transportation Program Grants
MANAGEMENT + MAINTENANCE	CalRecycle – Illegal Disposal Site Abatement Grant Program
	Environmental Protection Agency – Urban Waters Small Grants
	CalTrans & Safe Routes to Schools National Partnership – Active Transportation Program Grants
	Prospective Funding: California Prop. 1 Water Quality, Supply, and Infrastructure Improvement Act of 2014
COMMUNITY OUTREACH	Environmental Protection Agency – Urban Waters Small Grants
	Prospective Funding: California Prop. 1 Water Quality, Supply, and Infrastructure Improvement Act of 2014
	National Fish and Wildlife Foundation – Five Star and Urban Waters Restoration Grant Program
	CalTrans – Sustainable Transportation Planning Grants

TABLE 9.5
POTENTIAL GREEN ALLEY FUNDING SOURCES BY FUNDING POTENTIAL



MONITORING + EVALUATION

Green alley network design is a relatively new venture, and therefore few studies exist on the resulting quantitative and qualitative benefits. The Sustainable Communities Planning Grant and Incentives Program, which has funded this project, requires the measurement of indicators of greenhouse gas emissions before and after implementation of the plan. The Landscape Architecture Foundation provides benefits calculators and also funds student-faculty research teams who work with practitioners to record the benefits of high-performing landscape projects (Landscape Architecture Foundation n.d.). This program could prove an invaluable resource for evaluating and documenting the performance of green alley networks.

In addition to monitoring greenhouse gas emissions, the AMP recommends monitoring other indicators in order to contribute to the body of knowledge regarding landscape performance. Appendix D includes two tables, the Sustainability Indicators Table and the Predicted Performance Table, both of which will support the monitoring of BMPs in green alley projects and are preliminary suggestions for evaluating green alley network projects, based on the AMP objectives. Also included in Appendix D is a listing of sample online modeling tools that can be used to evaluate the performance of specific BMP's based on measures like carbon

FIGURE 9.6
PROPERTY ADJACENT TO AN ALLEY IN THE AMP PROJECT AREA

sequestration, cooling energy savings, and runoff volumes among others.

The Sustainability Indicators Table provides a number green alley indicators, like tree canopy coverage and impervious surface cover, along with their desired outcomes. For instance, in a green alley project, the desired outcome would be to would be to increase tree canopy coverage and decrease impervious surface cover. For each indicator and outcome, the table offers a means of measuring progress toward the desired outcome.

The Predicted Performance Table on the other hand is designed to set targets or goals for the desired outcomes for the indicators included in the Sustainability Indicators Table. It is a sample table, however, and is not fully inclusive of all green alley projects and BMP choices. Still, it can be used as a guide for creating evaluative tools for green alley projects. Through these types of tools, green alley projects can be monitored and progress toward desired outcomes evaluated.

Once alley specific designs have been developed for the networks and the specific elements for implementation have been decided upon, more specific evaluation plans should be developed based upon the measures of performance for each BMP and intervention used.

One strategy of particular importance is to measure capture flows for BMPs. Capture flows should be gauged in all new alley retrofit projects in order to measure the amount of water supply benefit a project is providing to the City of Los Angeles. The most cost effective approach would be to use a portable and battery operated flow meter which can then be transferred to subsequent alley retrofits once the water capture capacity of a project is understood. The cost of a portable flow meter is included in Table 9.4.



FIGURE 9.7
VEGETATION AND DUMPING IN AN ALLEY IN THE AMP PROJECT AREA

INTEGRATED COMMUNITY OUTREACH EXAMPLES: AVALON DEMONSTRATION PROJECT	
PHASE I Getting Excited	Door-to-door flyering, tabling and living room meetings around: What is a green alley?
	Presenting at schools, community centers, parent meetings and neighborhood council meetings.
	Posting "No Dumping" signs and partner-led alley cleanups.
	Tree-care training and workshops.
PHASE II Partnerships & Funding	Organize and facilitate monthly informal chats ("platicas"), informal talks and lectures, through partnerships with nearby amenities, such as schools, churches, and invested organizations such as Tree People.
	Develop a team of people to lead green alleys clean-ups.
	Offer awards to those that attend a certain number of events.
	Facilitate graffiti abatement in partnership with CRCD and the Los Angeles Conservation Corps.
PHASE III Design & Permitting	Participatory design feedback in a10-minute interview format.
	Attending free neighborhood-wide events held by TPL and partners that could include potlucks, end-of-schools BBQs and Earth Day Tree-Planting.
	Events encourage the expansion of the core team.
PHASE IV Construction & Implementation	Holding community information meetings during construction.
	Organizing tree planting and cleanup community events.
	Facilitating the participatory process for art to be added in the alley.
	Organizing alley grand-opening.
PHASE V Maintenance & Stewardship	Maintenance provide by a nearby school through the integration of standards-based on content about green alleys into their curriculum.
	Provisions of training to the core team, a group that meets monthly in support of the project, to prepare them as green alley stewards: tree planting and tree maintenance, community education on bulky item pickup, even organizing.
	Facilitate an increase in participation and stewardship through organized days of service and other events approximately 2 to 3 times per year in a given alley.
PHASE VI Monitoring & Evaluation	Interview residents through pre- and post- implementation evaluation through surveys.

RESOURCES AND CONSIDERATIONS

Continued involvement with the community as these projects progress is imperative. The value of community participation at the site scale is that it can yield detailed information that can be used to make design decisions that are reflective of the community's unique identity. In order to continue to engage residents on green alleys as these projects evolve within their neighborhoods, a series of network related design decisions should be explored in conjunction with community member input as these projects move forward. There are a number of tools and strategies that can be used to accomplish this goal.

For instance, asset mapping with community members could be a powerful way to identify destinations to use in a wayfinding and signage program. In addition, The Trust for Public Land and University of California, Los Angeles' *Avalon Green Alley Network Demonstration Project: Lessons Learned from Previous Projects for Green Alley Development in Los Angeles and Beyond*, discusses a number of community outreach strategies used at the network scale to transform an alley within the Avalon network. Table 9.8 outlines outreach techniques used at Avalon for each phase of the project while specific topics for further community involvement are listed in Chapter 8.

TABLE 9.8
INTEGRATED COMMUNITY OUTREACH EXAMPLES: AVALON DEMONSTRATION PROJECT

Beyond these suggested topics the AMP strongly suggests that the local community be involved to the greatest extent possible in these projects as the implementation of green alley networks moves forward. Local materials should be prioritized in designs and utilized in construction when possible. Perhaps more importantly, local services and labor should also be utilized – from hiring contractors that are based within the project area to hiring local residents to facilitate community outreach efforts to involving residents who live along the alleys in painting, planting, or other suitable undertakings.

While many green infrastructure design best practices require a certain level of invested capital and expertise to implement, it should be noted that positive changes, which do not necessarily require large amounts of money, but do need the involvement of the local community, can be enacted now. Alley beautification projects similar to those that have occurred recently in Boyle Heights illustrate how preliminary measures residents can undertake immediately with little more than a few supplies and dedication of time and energy can be of benefit to the local community (Fortin 2013). Examples include: neighborhood clean-up days, fence painting to cover tagging or to create murals, naming alleys, and making and installing signs. The intent of the signs could range from creating an identity, to showing that residents

care about their alleys, to discouraging dumping in or abuse of the space.

The Los Angeles Department of Transportation (LA DOT) has launched a new program, People St - Los Angeles, which establishes a method and framework for communities to temporarily convert street space to pedestrian plazas, parklets, or bicycle corrals (City of Los Angeles Department of Transportation n.d.) Alleys which fit the criteria outlined in the program are eligible for temporary conversions under this program. Organizations interested in exploring the potential for an alley to be converted into a parklet or pedestrian plaza are encouraged to meet early and often with staff at LA DOT in order to determine project eligibility and submit an application during their application window. More information on this program can be found here: http://peoplest.lacity.org/

Many individuals have already worked toward accomplishing and understanding green alley projects, some even in the South Los Angeles area. While this is not an exhaustive list, many useful recommendations that can be consulted to support green alley work are included in Table 9.9.

TABLE 9.9
USEFUL RESOURCES LIST FOR GREEN ALLEY PROJECTS

USEFUL RESOURCES LIST FOR GREEN ALLEY PROJECTS	
RESOURCE:	***Green Alleys in South Park Visioning Report***
HELPFUL CONTENT:	This report includes several different alley typologies for 22 alley segments within the South Park area of Downtown Los Angeles that can provide design insight for those pursuing a green alleys project. The typologies have different levels of transformation which are dependent upon the ultimate use of the alley and their adjacent land-use. In addition, in the section "Alley Menu" direct costs are provided for a variety of green alley amenities. The report serves as a good source of practical information regarding green alley development, as well as creative design solutions.
LOCATION:	http://southpark.la/wp-content/uploads/2013/12/Final-Report-10_21-SM.pdf
RESOURCE:	***Avalon Green Alley Network Demonstration Project: Lessons Learned from Previous Projects for Green Alley Development in Los Angeles and Beyond***
HELPFUL CONTENT:	The report explores ways in which the Avalon Project could be a model for greening alleyways within the City of Los Angeles. However, despite a Los Angeles focus, many of the challenges and solutions presented in this document can be applied to other communities across the nation. This report is to be used as a foundation for sharing lessons learned to help expand green alleys in Los Angeles and elsewhere. In addition, green alley projects across the nation have been analyzed and summarized within the report, providing excellent reference materials.
LOCATION:	http://164.67.121.27/files/Downloads/luskincenter/Publications/Avalon_Case_Study.pdf
RESOURCE:	***Transforming Alleys into Green Infrastructure for Los Angeles***
HELPFUL CONTENT:	This report introduces readers to the key characteristics of alleys in Los Angeles and the stakeholders—residents, businesses, and government agencies—that use them. Current jurisdiction and use of alleys is examined to help determine which stakeholders will need to be involved when planning an alley conversion. In addition, the report provides several case studies of alley projects across the nation that Los Angeles can learn from when implementing green infrastructure in alleys. Through these case studies, information on materials, costs, administrative structures, maintenance, and community involvement are provided. The report further suggests how to best combine the various techniques and tools to develop a Green Alley Program for Los Angeles. Policy recommendations for the City of Los Angeles are provided.
LOCATION:	http://nacto.org/docs/usdg/transforming_alleys_into_green_infrastructure_la.pdf
RESOURCE:	***How to Lead an Alley Revitalization Project: A Guide***
HELPFUL CONTENT:	This guide is useful for those interested in developing, managing and completing an alley revitalization project in their neighborhood. It offers a "how-to" for gathering support, recruiting and managing volunteers, fundraising, working with agency representatives for project permitting, planning community events, and establishing a long-term maintenance program. It includes a Project Readiness Checklist, a suggested timeline for achieving various planning goals, project management tips, methods for budgeting and financing a project and a list of important contacts and Dig Alert information.
LOCATION:	http://clkrep.lacity.org/onlinedocs/2008/08-0102_misc_9-1-08.pdf
RESOURCE:	***DRAFT: Southeast Los Angeles Open Space Vision Plan***
HELPFUL CONTENT:	Presented in English and Spanish, this report catalogues open space needs within the community plan areas of Arleta-Pacoima, Boyle Heights, Central Los Angeles (Downtown), Southeast Los Angeles, and Wilmington-Harbor City. The goal is to create unique, neighborhood-specific open space plan for each of the five identified areas. It includes a background of the focused area along with methods utilized to conduct the study in regards to public outreach and the results of such outreach. In addition, it provides steps for policymakers, non-profit organization, public agencies, private actors, and community members to undertake for improving access to and quality of open space in Southeast Los Angeles.
LOCATION:	http://creativeopenspacela.org/files/COSLA%20Southeast%20LA%20Report%20(1).pdf
RESOURCE:	***Community Transformation Toolkit***
HELPFUL CONTENT:	This toolkit provides a framework for creating a grass roots initiative for change. It shares resources found to overcome such obstacles, for example a 'Facilitator's Guide,' which offers lesson plans and training materials (in English and Spanish) to be utilized among community members.
LOCATION:	http://chc.live.radicaldesigns.org/downloads/CHC_Community_Transformation_Toolkit.pdf



LOS ANGELES AND BEYOND

Homeowners across the country who are fortunate enough to live adjacent to a green alley are already reaping the benefits provided by livable spaces designed with efficient and effective infrastructure. Many of the individual design elements discussed in this report provide both ecological and social benefits, but planners and designers should remember that the benefits of a well-designed neighborhood are far greater than the benefits of its many parts. Much as each component of a functional ecosystem depends on the health and vitality of its other components, so too does a healthy and resilient community thrive by building upon the momentum of individual successes. Projects that supply multiple social and ecological benefits are signs of wise investments. The multiplicative effect that such benefits have upon one another is the hallmark of truly functional and effectively designed change.

While many of the benefits of each green alley segment are contained within its surrounding city block, and those of a green alley network improve the larger neighborhood, a city-wide system of green alley networks creates measurable advantages for the entire region and watershed. Indeed, the benefits of ecologically sound systems are perhaps clearest at the watershed scale given our current understanding of the profound anthropogenic effects upon air pollution,

FIGURE 9.10
COOKOUT AT GILBERT LINDSAY PARK

water pollution, and microclimate. Similarly, we now know how and why high-performing public spaces have clear associations with reductions in property crime and violent crime, increased public health, increased property values, and more stable communities.

These accumulated benefits will assist the City of Los Angeles and other large American cities in undertaking similar projects. These cities and their partners will gain an understanding of the challenges and benefits of such projects through the research and analyses provided by *Alleys Amplified: The South Los Angeles Green Alley Master Plan* and through the on-the-ground experience of the community design process and implementation. Additionally, the experience of early projects—such as the Avalon Green Alley Demonstration Project—aid in determining potential policy hurdles and unique challenges involved in designing and building at the alley scale. Thorough preparation, data collection, analysis, and community involvement combine to create a template for future green alley projects in Los Angeles, as well as other communities where people are committed to positive change.

FIGURE 9.11
ALLEY VEGETATION IN WESTERN-MLK NETWORK

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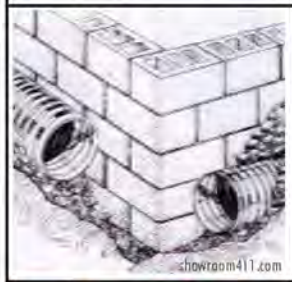
APPENDICES

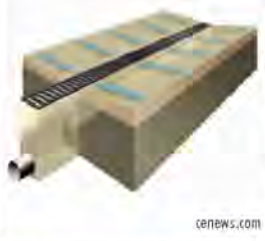
APPENDIX A
ALLEY DEVELOPMENT ALTERNATIVES

ALLEY DEVELOPMENT ALTERNATIVES			
IMAGE	FEATURE	DESCRIPTION & MORE INFO	OBJECTIVES
	Canopy/Street Trees	Canopy/street trees provide multiple benefits; trees expand the urban forest, help to cool the environment, provide shade, lower air temperatures, reduce air pollution, increase property values, provide wildlife habitat, and provide aesthetic benefits. Native tree species provide higher habitat value. Canopy trees are able to capture and absorb rainwater through their leaves, branches, and trunks. When planted in strategic locations, especially to the west or east side of buildings, canopy/street trees effectively reduces the urban heat island effect by cooling buildings and reducing energy consumption. (US EPA, Office of Atmospheric Protection, Climate Protection Partnership Division 2008, Center for Neighborhood Technology 2010). [1] City of Los Angeles Department of Public Works Bureau of Sanitation Rainwater Harvesting Program: *Green Streets & Green Alleys Design Guidelines Standards*, 1st Edition (2009); [2] City of San Francisco *Better Streets Plan* (2010); [3] Center for Neighborhood Technology *The Value of Green Infrastructure: A Guide to Recognizing its Economical, Environmental, and Social Benefits* (2010); [4] US EPA, Office of Atmospheric Protection, Climate Protection Partnership Division *Reducing Urban Heat Islands: Compendium of Strategies* (2008)	 CAPTURE & CONVEYANCE  SHADING EVAPORATION / TRANSPIRATION  USER COMFORT HABITAT  IDENTIFICATION & WAY FINDING
	Cisterns/Rain Barrels	A cistern or rain barrel captures and stores rainwater from the roof of a building to be used for a variety of purposes, including watering plants (City of Chicago Department of Transportation n.d.). [1] City of Chicago Department of Transportation *The Chicago Green Alley Handbook* (n.d.)	 CAPTURE & CONVEYANCE
	Constructed Swale (impermeable)	Impermeable constructed swales can be utilized to convey stormwater from areas that are not suitable for filtration or infiltration BMPs, to areas where such BMPs can be located. [1] Los Angeles County *Model Design Manual for Living Streets* (2011)	 CAPTURE & CONVEYANCE

ALLEY DEVELOPMENT ALTERNATIVES

IMAGE	FEATURE	DESCRIPTION & MORE INFO	OBJECTIVES
	Fountains	Fountains can provide entertainment, cool the micro-climate, contribute visual interest, and screen noises. Fountains could be utilized as an artistic and creative means to capture and convey stormwater.	CAPTURE&CONVEYANCE
	French Drain	A french drain is a variation of an infiltration trench designed to capture, temporarily store, and, through a perforated pipe, infiltrate stormwater runoff. Additionally, a roof leader may connect the stormwater runoff from rooftops directly to the french drain for infiltration into the ground (Pennsylvania Department of Environmental Protection 2006). [1] Pennsylvania Department of Environmental Protection *Pennsylvania Stormwater Best Management Practices Manual* (2006)	CAPTURE&CONVEYANCE
	Interactive Art/Play Elements	The AMP recommends integrating stormwater with interactive, artistic, and/or play elements in the landscape. The pictured installation utilizes rainwater to demonstrate rainfall volumes and hydrological processes.	CAPTURE&CONVEYANCE
	Perforated Pipe	A perforated pipe buried underground allows stormwater to be conveyed after the surrounding ground becomes saturated and can no longer infiltrate stormwater. This allows the stormwater to be infiltrated in another area or to enter the storm drain network during high-flow events.	CAPTURE&CONVEYANCE
	Rain Fences	Rain fences are modified rain barrels designed to capture and store stormwater runoff. Rain fences are thin and can fit into narrow spaces, or along walls or fences. They are solutions for storing rainwater in spaces that are too narrow for rain barrels.	CAPTURE&CONVEYANCE

ALLEY DEVELOPMENT ALTERNATIVES

IMAGE	FEATURE	DESCRIPTION & MORE INFO	OBJECTIVES
 cenews.com	Trench Drain	A trench drain is a long, narrow underground channel designed to quickly and efficiently convey stormwater runoff. [1] Los Angeles County *Model Design Manual for Living Streets* (2011)	CAPTURE & CONVEYANCE
	Biotreatment Curb Inlets	Biotreatment curb inlets add green space to the urban environment and, when installed upstream of a catch basin, work effectively to treat stormwater runoff through filtration (City of Los Angeles Department of Public Works Bureau of Sanitation 2009). Biotreatment curb inlets mitigate the urban heat island effect through evaporative cooling and the reduction of surface albedo (Center for Neighborhood Technology 2010). [1] City of Los Angeles Department of Public Works Bureau of Sanitation *Rainwater Harvesting Program: Green Streets & Green Alleys Design Guidelines Standards*, 1st Edition (2009)	STORMWATER FILTRATION EVAPORATION / TRANSPIRATION
	Flow-through Planters	Flow-through planters treat stormwater runoff by filtration of stormwater through soil media and vegetation before it enters a perforated pipe and is discharged to the storm drain network. They also allow for evapotranspiration through planted vegetation (City of Los Angeles Department of Public Works Bureau of Sanitation 2009). Flow-through planters help to mitigate the urban heat island effect through evaporative cooling and the reduction of surface albedo (Center for Neighborhood Technology 2010). Flow-through planters can increase the habitat if planted with native vegetation. [1] City of Los Angeles Department of Public Works Bureau of Sanitation *Rainwater Harvesting Program: Green Streets & Green Alleys Design Guidelines Standards*, 1st Edition (2009)	STORMWATER FILTRATION EVAPORATION / TRANSPIRATION HABITAT
	Pervious /Permeable Pavement	Pervious/permeable asphalt or concrete is a durable surface material that allows rainwater to percolate through prior to infiltrating or drainage to an overflow system. Pervious/permeable pavement helps to mitigate the urban heat island effect by absorbing less heat than conventional pavement and through evaporation of the rainwater it captures, thereby reducing the surrounding air temperature and decreasing the amount of energy needed for cooling (Center for Neighborhood Technology 2010). Plaza-type open spaces should utilize pervious/permeable paving. Pervious/permeable asphalt or concrete is a durable surface material that allows rainwater to percolate prior to infiltrating or drainage to an overflow system. Appropriate paving can improve access to and use of alleys. [1] City of Los Angeles Department of Public Works Bureau of Sanitation *Rainwater Harvesting Program: Green Streets & Green Alleys Design Guidelines Standards*, 1st Edition (2009); [2] City of San Francisco *Better Streets Plan* (2010); [3] Center for Neighborhood Technology *The Value of Green Infrastructure: A Guide to Recognizing its Economical, Environmental, and Social Benefits* (2010)	STORMWATER FILTRATION STORMWATER INFILTRATION EVAPORATION / TRANSPIRATION SURFACE TREATMENT ACCESS ACCESS

ALLEY DEVELOPMENT ALTERNATIVES

IMAGE	FEATURE	DESCRIPTION & MORE INFO	OBJECTIVES
	Pervious Pavers	Pavers set in a bed of aggregate allow rainwater to percolate and infiltrate or drain to an overflow system. Plaza-type open spaces should utilize pervious paving. Pavers set in a bed of aggregate allow rainwater to percolate and infiltrate or drain to an overflow system. Appropriate paving can improve access to and use of alleys. [1] City of Los Angeles Department of Public Works Bureau of Sanitation *Rainwater Harvesting Program: Green Streets & Green Alleys Design Guidelines Standards*, 1st Edition (2009)	STORMWATER FILTRATION STORMWATER INFILTRATION ACCESS ACCESS
	Plant palette: Bioremediation	Bioremediation plants are effective for removing pollutants from stormwater and soil and therefore improve habitat value. [1] Bob Perry *Landscape Plants for California Gardens* (2010)	STORMWATER FILTRATION STORMWATER INFILTRATION HABITAT
	Storm Drain Filter	Storm drain filters are attached within storm drains to filter some pollutants, such as oil and grease, from stormwater. [1] Los Angeles County *Model Design Manual for Living Streets* (2011)	STORMWATER FILTRATION
	Storm Drain Inlet Screen	Storm drain inlet screens cover storm drain inlets to prevent trash and other large debris from entering the storm drain system, and from ultimately ending up in creeks, rivers, or oceans. [1] Los Angeles County *Model Design Manual for Living Streets* (2011)	STORMWATER FILTRATION
	Infiltration Boardwalk	Infiltration boardwalks are segments of sidewalks or curb extensions reconstructed to be raised boardwalks that allow stormwater to be captured and treated beneath its walking surface for infiltration into the soils below (City of San Francisco (2010). Infiltration boardwalks help to mitigate the urban heat island effect by replacing pavement, which would otherwise absorb sunlight and radiate heat, with unpaved surfaces that are less absorbent. [1] City of San Francisco *Better Streets Plan* (2010)	STORMWATER INFILTRATION SURFACE TREATMENT

ALLEY DEVELOPMENT ALTERNATIVES

IMAGE	FEATURE	DESCRIPTION & MORE INFO	OBJECTIVES
	Vegetated Swales	Vegetated swales, or bioswales, are installed within or along parking lots, along roads, and along sidewalks to best allow for the capture and conveyance of stormwater runoff. Once stormwater runoff has been collected, vegetated swales should be designed to trap and treat pollutants through filtration (Center for Neighborhood Technology 2010). They can be designed to filter and convey stormwater, or to allow infiltration. When planted with native plants they also provide habitat. [1] Center for Neighborhood Technology *The Value of Green Infrastructure: A Guide to Recognizing its Economical, Environmental, and Social Benefits* (2010); [2] City of San Francisco *Better Streets Plan* (2010)	STORMWATER FILTRATION STORMWATER INFILTRATION EVAPORATION / EVAPOTRANSPIRATION SURFACE TREATMENT HABITAT
	Bioretention Areas	Bioretention areas are ideal in parking lots as shallow, landscaped areas where stormwater runoff is infiltrated into the subsurface or collected into a pipe for discharge into a stormwater facility (City of Los Angeles Department of Public Works Bureau of Sanitation 2009). Bioretention ponds/basins are similar to rain gardens in that stormwater runoff is effectively treated through capture and infiltration, and the urban heat island effect is mitigated through evaporative cooling and the reduction of surface albedo. [1] City of Los Angeles Department of Public Works Bureau of Sanitation *Rainwater Harvesting Program: Green Streets & Green Alleys Design Guidelines Standards*, 1st Edition (2009)	STORMWATER INFILTRATION EVAPORATION / EVAPOTRANSPIRATION SURFACE TREATMENT
	Detention Basin/ Retention Pond	A detention basin or retention pond is an area designed to look and function as a native wetland that temporarily stores captured stormwater runoff while the runoff is released at a controlled rate for infiltration and/or treatment (City of Chicago Department of Transportation n.d.) Detention basins typically only hold water after storm events, but remain dry at other times. Retention basins typically maintain a volume of water, and infiltrate the runoff higher than the sealed liner. Detention ponds/basins help to mitigate the urban heat island effect by simultaneously radiating less heat and cooling the environment with its waters. [1] City of Chicago Department of Transportation *The Chicago Green Alley Handbook* (n.d.)	STORMWATER INFILTRATION EVAPORATION / EVAPOTRANSPIRATION SURFACE TREATMENT HABITAT
	Infiltration Planters	Infiltration planters are vegetated, shallow depressions with vertical side walls that provide opportunities for stormwater runoff storage, infiltration, and evapotranspiration. The walls of the infiltration planters allow for more storage of stormwater runoff in less space (City of Los Angeles Department of Public Works Bureau of Sanitation 2009). Infiltration planters mitigate the urban heat island effect through evaporative cooling and the reduction of surface albedo (Center for Neighborhood Technology 2010). If native plants are used they can increase habitat value. [1] City of Los Angeles Department of Public Works Bureau of Sanitation *Rainwater Harvesting Program: Green Streets & Green Alleys Design Guidelines Standards*, 1st Edition (2009); [2] City of San Francisco Better Streets Plan (2010)	STORMWATER INFILTRATION EVAPORATION / EVAPOTRANSPIRATION HABITAT

ALLEY DEVELOPMENT ALTERNATIVES

IMAGE	FEATURE	DESCRIPTION & MORE INFO	OBJECTIVES
	Infiltration Trench	An infiltration trench is a long, narrow, rock-filled trench typically 2 to 5 feet deep and bordered on either side by a vegetated buffer. The buffer minimizes the amount of coarse sediments and/or debris entering the trench, which can cause clogging. Infiltration trenches are designed to capture, store, and infiltrate stormwater runoff and, due to its configuration, would be appropriate for implementation in right-of-ways, medians, and alleys (City of Los Angeles DPW Bureau of Sanitation 2009, City of San Francisco 2010). [1] City of Los Angeles Department of Public Works Bureau of Sanitation *Rainwater Harvesting Program: Green Streets & Green Alleys Design Guidelines Standards*, 1st Edition (2009); [2] City of San Francisco *Better Streets Plan* (2010)	STORMWATER INFILTRATION
	Percolation Curb Inlet	Percolation curb inlets are modified catch basins designed to capture, treat, and infiltrate stormwater runoff (City of Los Angeles Department of Public Works Bureau of Sanitation 2009). [1] City of Los Angeles Department of Public Works Bureau of Sanitation Rainwater Harvesting Program: *Green Streets & Green Alleys Design Guidelines Standards*, 1st Edition (2009)	STORMWATER INFILTRATION
	Rain Garden	Rain gardens are areas landscaped with native plants that slow down stormwater runoff from surrounding impervious surfaces, such as roofs, sidewalks, and parking lots, capturing and infiltrating runoff back into the soil (City of Chicago Department of Transportation n.d.). Rain gardens mitigate the urban heat island effect through evaporative cooling and the reduction of surface albedo (Center for Neighborhood Technology 2010). [1] City of Chicago Department of Transportation *The Chicago Green Alley Handbook* (n.d.); [2] Center for Neighborhood Technology *The Value of Green Infrastructure: A Guide to Recognizing its Economical, Environmental, and Social Benefits* (2010)	STORMWATER INFILTRATION EVAPORATION / EVAPOTRANSPIRATION SURFACE TREATMENT HABITAT
	High Albedo Pavement, Walls and Roofs (also known as Cool Pavement and Cool Roofs)	Pavement, walls, and roofs high in albedo (also known as "cool pavement" and "cool roofs") are surfaces lighter in color that are better able to reflect sunlight away from the surface so that less sunlight is absorbed and less heat is radiated (City of Chicago Department of Transportation n.d.). This helps mitigate the urban heat island effect and improve the microclimate for pedestrians and bicyclists. [1] US EPA, Office of Atmospheric Protection, Climate Protection Partnership Division *Reducing Urban Heat Islands: Compendium of Strategies* (2008); [2] City of Chicago Department of Transportation *The Chicago Green Alley Handbook* (n.d.)	SURFACE TREATMENT USER COMFORT

ALLEY DEVELOPMENT ALTERNATIVES

IMAGE	FEATURE	DESCRIPTION & MORE INFO	OBJECTIVES
	Understory Landscaping	Understory landscaping is comprised of low plantings below 18 inches that provide green benefit, wildlife habitat, and do not obscure visibility. For understory landscaping in the project area, drought-tolerant species should be prioritized. These vegetated areas provide additional opportunities for stormwater infiltration. Drought-tolerant understory landscaping aids in the mitigation of the urban heat island effect by increasing surface albedo and cooling the microclimate through evapotranspiration (City of Los Angeles Department of Public Works Bureau of Sanitation 2009). [1] City of Los Angeles Department of Public Works Bureau of Sanitation *Rainwater Harvesting Program: Green Streets & Green Alleys Design Guidelines Standards*, 1st Edition (2009)	STORMWATER INFILTRATION EVAPORATION / EVAPOTRANSPIRATION SURFACE TREATMENT USER COMFORT
	Recycled Rubber Sidewalk	Recycled rubber sidewalks are typically used to replace concrete sidewalks that have been damaged by tree roots. They are made from recycled rubber from discarded tires and they also allow infiltration of stormwater (City of Los Angeles Department of Public Works Bureau of Sanitation 2009). In addition to recycled rubber, other recycled construction materials may be incorporated into the pavement of green alleys, including recycled concrete aggregate and slag, a by-product of steel production (City of Chicago Department of Transportation n.d.). Recycled rubber sidewalks also provide a softer ground material that is more appropriate for running and jogging than concrete or asphalt. [1] City of Los Angeles Department of Public Works Bureau of Sanitation *Rainwater Harvesting Program: Green Streets & Green Alleys Design Guidelines Standards*, 1st Edition (2009); [2] City of Chicago Department of Transportation *The Chicago Green Alley Handbook* (n.d.)	STORMWATER INFILTRATION USER COMFORT ACCESS
	Reinforced Grass Grid Pavers	Grass grid pavers are a type of open-cell unit paver that provide structural support integrated with vegetation and percolation; pavers are typically made of concrete or synthetic material (City of Los Angeles Department of Public Works Bureau of Sanitation 2009). Plaza-type or flexible-use open spaces should utilize pervious paving. Grass grid pavers are a type of open-cell unit paver that provide structural support integrated with vegetation and allow percolation; pavers are typically made of concrete or synthetic material (City of Los Angeles Department of Public Works Bureau of Sanitation 2009). Appropriate paving can improve access to and use of alleys. [1] City of Los Angeles Department of Public Works Bureau of Sanitation Rainwater Harvesting Program: *Green Streets & Green Alleys Design Guidelines Standards*, 1st Edition (2009)	STORMWATER INFILTRATION ACCESS EVAPORATION / EVAPOTRANSPIRATION SURFACE TREATMENT ACCESS
	Stormwater Curb Extensions	Stormwater curb extensions are vegetated, shallow depressions with vertical side walls that extend beyond the sidewalk to act as both a traffic calming strategy and to provide opportunities for stormwater runoff storage, infiltration, and evapotranspiration. The walls of the stormwater curb extensions allow for more storage of stormwater runoff in less space (City of Los Angeles Department of Public Works Bureau of Sanitation 2009). Stormwater curb extensions mitigate the urban heat island effect through evaporative cooling and the reduction of surface albedo (Center for Neighborhood Technology 2010). [1] City of Los Angeles Department of Public Works Bureau of Sanitation Rainwater Harvesting Program: *Green Streets & Green Alleys Design Guidelines Standards*, 1st Edition (2009)	STORMWATER INFILTRATION EVAPORATION / EVAPOTRANSPIRATION

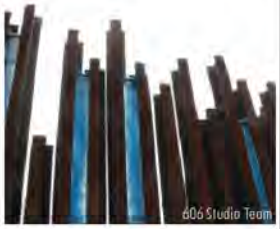
ALLEY DEVELOPMENT ALTERNATIVES

IMAGE	FEATURE	DESCRIPTION & MORE INFO	OBJECTIVES
	Green Wall	Green walls, also referred to as living walls, green facades, bio walls, or vertical vegetation, are freestanding structural systems covered in vegetation, either adjacent or attached to a wall, or vegetation directly grown on building facades (Centre for Subtropical Design 2007 in Loh 2008). Green walls help to mitigate the urban heat island effect by reducing heat transfer, or flux, thereby reducing surrounding air temperatures (US EPA, Office of Atmospheric Protection, Climate Protection Partnership Division 2008). They may require significant irrigation to maintain in Southern California. [1] Susan Loh "Living Walls - A Way to Green the Built Environment" (2008); [2] US EPA, Office of Atmospheric Protection, Climate Protection Partnership Division *Reducing Urban Heat Islands: Compendium of Strategies* (2008)	EVAPORATION / EVAPOTRANSPIRATION SURFACE TREATMENT
	Green Roof	Green roofs are rooftops partially or completely covered in vegetation with varying depths of growing media (Green Roofs for Healthy Cities 2010 in Center for Neighborhood Technology 2010). Green roofs help to mitigate the urban heat island effect by reducing heat transfer, or flux, thereby reducing surrounding air temperatures and cooling the urban environment (US EPA, Office of Atmospheric Protection, Climate Protection Partnership Division 2008). They may require significant irrigation to maintain in Southern California. [1] www.greenroofs.org; [2] Center for Neighborhood Technology *The Value of Green Infrastructure: A Guide to Recognizing its Economical, Environmental, and Social Benefits* (2010); [3] US EPA, Office of Atmospheric Protection, Climate Protection Partnership Division *Reducing Urban Heat Islands: Compendium of Strategies* (2008)	SURFACE TREATMENT
	Parking Space "Park" / Pocket Park / Parklet	A parking space "park" / pocket park / parklet is created when a curbside parking space or small vacant parcel is converted into space for public use, temporarily, semi-permanently, or permanently. Vegetation can help cool the microclimate through evapotranspiration. Shade structures can also help cool the environment. In addition, these spaces can be used for outdoor dining, seating, or other creative uses. [1] City of San Francisco *Better Streets Plan* (2010); [2] PARK(ing) Day www.parkingday.org/resources	EVAPORATION / EVAPOTRANSPIRATION SURFACE TREATMENT ACCESS RECREATION
	Shade Structures	Constructed shade structures should be durable and low maintenance, and should be placed so as to not compromise the privacy or security of surrounding properties. Like canopy/street trees, shade structures mitigate the urban heat island effect by creating shade and reducing the amount of sunlight reaching the pavement below.	SHADING USERCOMFORT USERCOMFORT

ALLEY DEVELOPMENT ALTERNATIVES

IMAGE	FEATURE	DESCRIPTION & MORE INFO	OBJECTIVES
	Water Features	Water features, such as fountains, can provide entertainment, cool the micro-climate, contribute visual interest, and screen noises. Water features re able to reduce the urban heat island effect due to the high-heat-absorbing capacity of water and its ability to maintain a fairly constant temperature throughout the day and night (US EPA, Office of Atmospheric Protection, Climate Protection Partnership Division 2008). [1] United States Environmental Protection Agency, Office of Atmospheric Protection, Climate Protection Partnership Division *Reducing Urban Heat Islands: Compendium of Strategies* (2008)	EVAPORATION / EVAPOTRANSPIRATION SURFACE TREATMENT USER COMFORT
	Bus Stop Shelters	Bus stop shelters should be durable and low maintenance, and should be identifiable to pedestrians and bicyclists. Like canopy/street trees, bus stop shelters mitigate the urban heat island effect by creating shade and reducing the amount of sunlight reaching the pavement below. To maximize mitigation of the urban heat island effect, the tops of bus stop shelters should be high in albedo.	SHADING
	Solar Panels	Solar panels should be durable and low maintenance, and should be placed so as not to compromise the privacy, security, or aesthetic quality of surrounding properties. Like canopy/street trees, solar panels mitigate the urban heat island effect by creating shade and reducing the amount of sunlight reaching the pavement below.	SHADING
	Bollards	A bollard is a short vertical post at an alley or street entrance that prevents vehicle access, but allows pedestrians and bicyclists to pass. Bollards can be removable or retractable to allow emergency or resident vehicles to pass through. [1] Los Angeles County *Model Design Manual for Living Streets* (2011); [2] City of San Francisco *Better Streets Plan* (2010)	ACCESS ACCESS
	Gates	Gates can be locked to only allow access to those with a key, or can be locked to restrict access at night (consult local legislation and policy regarding public access). Decorative gates are more welcoming. Residents may consider private pedestrian gates for accessing the alley from their property.	ACCESS ACCESS

ALLEY DEVELOPMENT ALTERNATIVES

IMAGE	FEATURE	DESCRIPTION & MORE INFO	OBJECTIVES
	Chain (to block vehicle access)	A chain extended across an alley or street entrance will prevent vehicle and bicycle access, and will impede pedestrian access. Space between the chain post and alley/street entrance edge will allow pedestrians and bicyclists to pass. Chains can be unlocked and removed to allow emergency or resident vehicles to pass through.	 ACCESS  ACCESS
	Temporary Closures (Pedestrian Street or Flexible Space)	Streets and alleys can be temporarily closed to provide space for any number of special community events, including art walks, block parties, book fairs, carnivals, concerts, farmers markets or other urban agriculture community events, flea markets, parades, sale events, and swap meets. [1] Walkinginfo.org *Pedestrian and Bicycle Information Center*	 ACCESS URBAN AGRICULTURE
	Public Art	Artistic elements, including durable, interactive, kinetic sculpture, and public art, lend visual interest, mental stimulation, and cues that the space is cared for. Local artisans should be employed when possible.	 USER COMFORT  USER COMFORT
	Drinking Fountains	Drinking fountains provide access to safe and free drinking water for pedestrians and bicyclists. Fixtures should be durable, water efficient, and allow unused water to infiltrate.	 USER COMFORT  USER COMFORT
	Plant Palette: Seasonal Variation	Plants that seasonally change foliage color, bloom, or produce fruit or berries add interest and variety, and contribute to placemaking and wayfinding. [1] Bob Perry *Landscape Plants for California Gardens* (2010)	 USER COMFORT  USER COMFORT

ALLEY DEVELOPMENT ALTERNATIVES			
IMAGE	FEATURE	DESCRIPTION & MORE INFO	OBJECTIVES
	Graffiti-Deterrent Surfaces	Anti-graffiti coatings or surface materials that cannot be easily painted over (such as vines) can discourage tagging and graffiti in public spaces.	USER COMFORT USER COMFORT
	Movable Furniture	Studies provide evidence that people prefer and are more likely to use furniture that is movable, versus furniture that is bolted to the ground. Furniture should be secured at night.	USER COMFORT USER COMFORT
	Kiosks/Bulletin Boards	Kiosks provide a location for community news and announcements and improve intra-community communication. [1] Los Angeles County *Model Design Manual for Living Streets* (2011); [2] City of San Francisco *Better Streets Plan* (2010)	USER COMFORT USER COMFORT
	Middle of Long Alley Segments	Long alleys can be less inviting, and feel more confining, for pedestrians. An amenity or focal point in the middle can provide a mid-point destination, making the alley seem shorter and more inviting.	USER COMFORT USER COMFORT
	Musical Elements	Music elements, such as music playing, bells, and wind chimes, can be incorporated as artistic features and audible landmarks.	USER COMFORT USER COMFORT

ALLEY DEVELOPMENT ALTERNATIVES

IMAGE	FEATURE	DESCRIPTION & MORE INFO	OBJECTIVES
	Plant Palette: Color-focused	Colorful plants enliven spaces. Seasonal color adds variety throughout the year. Color can also be used for placemaking and wayfinding. [1] Perry *Landscape Plants for California Gardens* (2010)	USER COMFORT RECREATION USER COMFORT
	Plant Palette: Edible	Edible plants provide a fresh food source, and engage the community through harvesting and care. They typically need more irrigation than native plants.	USER COMFORT URBAN AGRICULTURE USER COMFORT
	Plant Palette: Fragrant	Fragrant plants can enhance the experience of being in a place, and contribute to placemaking and wayfinding. [1] Bob Perry *Landscape Plants for California Gardens* (2010)	USER COMFORT USER COMFORT
	Utility Undergrounding	Putting overhead utility lines underground creates more clearance for canopy trees and improves the overall aesthetic of the neighborhood. [1] Los Angeles County *Model Design Manual for Living Streets* (2011); [2] City of San Francisco *Better Streets Plan* (2010)	USER COMFORT USER COMFORT
	Plant Palette: Therapeutic/ Ethnobotanical	Community gardens in alleys or vacant lots can also support medicinal or ethnobotanical plants. Therapeutic and ethnobotanical plants provide the added benefits of stimulating mental and/or physical health.	USER COMFORT URBAN AGRICULTURE USER COMFORT

ALLEY DEVELOPMENT ALTERNATIVES

IMAGE	FEATURE	DESCRIPTION & MORE INFO	OBJECTIVES
	Seating	Seating should be durable and low maintenance, and should be placed so as to not compromise the privacy or security of surrounding properties. [1] Los Angeles County *Model Design Manual for Living Streets* (2011); [2] City of San Francisco *Better Streets Plan* (2010)	USER COMFORT USER COMFORT
	Sundial in Paving	Shade structures or other shadow-casting elements combined with markings in the pavement can serve as a sundial, and a point of interest in the community.	USER COMFORT
	Utility Pole Treatment (aesthetic)	Utility poles are a common feature in alleys and streetscapes. Poles may be painted or screened with a utilities-approved material to convert them into artistic landscape elements.	USER COMFORT USER COMFORT
	Trash/Recycling Receptacles	Providing trash and recycling containers will reduce the amount of litter in public outdoor spaces. [1] Los Angeles County *Model Design Manual for Living Streets* (2011); [2] City of San Francisco *Better Streets Plan* (2010)	USER COMFORT USER COMFORT
	Public Restrooms	Restroom facilities that are publicly accessible throughout the day and night can help prevent the use of alleys as a substitute for toilet facilities. [1] City of San Francisco *Better Streets Plan* (2010)	USER COMFORT USER COMFORT

ALLEY DEVELOPMENT ALTERNATIVES

IMAGE	FEATURE	DESCRIPTION & MORE INFO	OBJECTIVES
	Understory Landscaping	Understory landscaping is comprised of low plantings below 18 inches that provide green benefit, wildlife habitat, and do not obscure visibility. For understory landscaping in the project area, drought-tolerant species should be prioritized. [1] City of Los Angeles Department of Public Works Bureau of Sanitation *Rainwater Harvesting Program: Green Streets & Green Alleys Design Guidelines Standards, 1st Edition* (2009)	USER COMFORT
	Water Features	Water features, such as fountains, can provide entertainment, cool the micro-climate, contribute visual interest, and screen noises.	USER COMFORT
	Security Cameras	Security cameras can increase surveillance, or the perception of surveillance, in alleys.	SECURITY SAFETY
	Convex Mirrors (Busybody)	A busybody refers to two or three small mirrors arranged at certain angles to allow for alley-adjacent residents to observe the alley without being observed themselves (franklinbusybody.com). Busybody mirrors can help increase surveillance of the alley, or mirrors placed in the alleys can provide visibility around blind corners. [1] Franklinbusybody.com	SECURITY SAFETY
	Security /Emergency Call Boxes	Emergency call boxes increase the perception of safety and allow those in need of help to be assisted.	SECURITY SAFETY

ALLEY DEVELOPMENT ALTERNATIVES

IMAGE	FEATURE	DESCRIPTION & MORE INFO	OBJECTIVES
	Fence Modifications: More Transparent	Fences that allow visual access into alleys improve safety and reduce the sense of confinement within alleys.	FENCING SAFETY
	Fence Modifications: Different Upper and Lower Portions	Fences can have different upper and lower potions to allow for some visibility into alleys while also maintaining some residential privacy.	FENCING SAFETY
	Fence Modifications: Lower	Lower fences improve visibility into alleys, and reduce the sense of confinement within alleys.	FENCING SAFETY
	Overhead Pathway Lighting	Overhead lights improve visibility, placemaking, and wayfinding.	LIGHTING LIGHTING
	Ground-level Pathway Lighting	Lighting at ground level, or embedded in the ground surface, improves nighttime visibility and contributes to placemaking and wayfinding.	LIGHTING LIGHTING

ALLEY DEVELOPMENT ALTERNATIVES

IMAGE	FEATURE	DESCRIPTION & MORE INFO	OBJECTIVES
	Dark Sky Compliant	Dark sky compliant lighting improves nighttime visibility without contributing to light pollution. [1] Los Angeles County *Model Design Manual for Living Streets* (2011); [2] City of Chicago Department of Transportation *The Chicago Green Alley Handbook* (n.d.)	LIGHTING LIGHTING
	Decorative/Colored Lighting	Decorative and colored lighting artistically improves nighttime visibility. It can also contribute to placemaking and wayfinding.	LIGHTING LIGHTING
	LED	LED (light-emitting diode) lights have longer lifetimes and consume less energy than other types of lighting.	LIGHTING LIGHTING
	Motion-activated Lights	Motion-activated lights can save operating costs by only turning on when someone approaches. They can also provide security by alerting adjacent residents that someone is passing through the alley.	LIGHTING LIGHTING
	Pedestrian-scale	Lights in parks and alleys should be scaled for the pedestrian experience, but be tall enough to avoid vandalism.	LIGHTING LIGHTING

ALLEY DEVELOPMENT ALTERNATIVES

IMAGE	FEATURE	DESCRIPTION & MORE INFO	OBJECTIVES
	Solar powered	Solar powered lights utilize photovoltaic cells and result in lower energy consumption. They are an excellent option in alleys that are not wired for lights.	LIGHTING LIGHTING
	Paving: Decorative	Decorative paving may be used in alley networks to create a unique sense of place, contribute to the character of the neighborhood, provide public art, and/or visually indicate a pedestrian and bicyclist realm. Decorative paving may extend from the alley into the street to indicate routes that link the two spaces. Local artisans should be employed when possible.	RECREATION USER COMFORT IDENTIFICATION / WAYFINDING
	Plant palette: Drought tolerant	Drought tolerant plants can enhance the experience of being in a place, and contribute to placemaking and wayfinding. They used to decrease the need for irrigation. [1] Bob Perry *Landscape Plants for California Gardens* (2010)	RECREATION HABITAT
	Play areas, structures, and interactive elements	Opportunities for play, including designated areas, formal play structures, or smaller interactive elements, may be accommodated in some alleys or pocket parks. Signage indicating children at play should be included in alleys that encourage play.	RECREATION
	Sports Areas	Sports areas, such as basketball, kickball, wall ball, volleyball, and tennis, may be accommodated in some alleys or pocket parks. Signage indicating children at play should be included in alleys with sports areas.	RECREATION

ALLEY DEVELOPMENT ALTERNATIVES

IMAGE	FEATURE	DESCRIPTION & MORE INFO	OBJECTIVES
	Bird Feeders	Bird feeders support wildlife but also provide an opportunity for viewing and learning about birds.	RECREATION HABITAT
	Dog Parks	In an appropriate context, alleys or vacant lots could be utilized as dog parks for pet owners that have small or no private yard space. Dog parks necessitate fencing and gates.	RECREATION
	Event Space	Various community events -- movie or sporting event screenings, block parties, swap meets, farmers markets, etc. -- can be accommodated in an alley, closed street, or vacant lot.	RECREATION
	Fitness Loop	Indicating a loop through a neighborhood network of alleys and sidewalks can encourage increased walking and jogging. Distance markers, trail maps, and fitness stations can enhance the fitness loop.	RECREATION
	Fitness Stations	Outdoor exercise equipment or stations may be accommodated in some alleys or pocket parks.	RECREATION

ALLEY DEVELOPMENT ALTERNATIVES			
IMAGE	FEATURE	DESCRIPTION & MORE INFO	OBJECTIVES
	Games	Games, such as bowling, chess/checkers, four square, hopscotch, jump rope, mini-golf, ping pong, and tetherball, may be accommodated in some alleys or pocket parks. Signage indicating children at play should be included in alleys with games.	RECREATION
	Gardens	Alleys or vacant lots could be utilized as gardens for homeowners that have small or no private yard space. Gardens may necessitate fencing and gates.	RECREATION
	Gathering Spaces	Alleys or vacant lots could be utilized as gathering spaces within the community, offering opportunities for community bonding and social activities.	RECREATION
	Grafitti-Encouraged Areas	Grafitti-encouraged areas provide an opportunity for community involvement and stewardship through artistic expression.	RECREATION
	Outdoor Café/ Restaurant Seating	Outdoor café/restaurant seating in the alleys are ideal for restaurants located within a commercial corridor adjacent to alleys. Outdoor seating supports alleys as gathering spaces and outdoor seating areas are typically dog-friendly. Outdoor cafés add 'eyes on the street'.	RECREATION

ALLEY DEVELOPMENT ALTERNATIVES

IMAGE	FEATURE	DESCRIPTION & MORE INFO	OBJECTIVES
	Shared Use Path	Shared use paths are sidewalks and walkways within the public right-of-way that are separated from vehicle traffic where a variety of two-way non-motorized travel is accommodated. Users of shared use paths include pedestrians, runners, bicyclists, wheelchair users, and in-line skaters (Walkinginfo.org n.d.). Alley networks will ideally have both pedestrian paths and bicycle lanes to accommodate pedestrians and bicyclists; however, where bicycle lanes are not feasible, shared use paths may be considered. [1] Walkinginfo.org *Pedestrian and Bicycle Information Center*	 RECREATION
	Skateboard Features	Skateboard features, such as ramps and rails, may be accommodated in some alleys or pocket parks. Signage indicating children at play should be included in alleys with skateboard features.	 RECREATION
	Water Features	Water features, such as bird baths, can attract wildlife as well as contribute visual interest.	 HABITAT
	Birdhouses	Birdhouses support wildlife and also provide an opportunity for viewing and learning about birds.	 HABITAT
	Plant Palette: Bees/ Butterflies	Utilizing plants that attract bees and butterflies enhance the habitat value and provides an opportunity for viewing and learning about insects. [1] Perry, Bob *Landscape Plants for California Gardens* (2010)	 HABITAT

ALLEY DEVELOPMENT ALTERNATIVES			
IMAGE	FEATURE	DESCRIPTION & MORE INFO	OBJECTIVES
	Compost Bin	Compost bins allow for the decomposition of yard and household waste to create organic fertilizer and provide nutrients to amend the soil for gardening. Compost bins reduce the amount of waste sent to landfills.	URBAN AGRICULTURE
	Plant Palette: Native	Native plants can enhance the experience of being in a place, and contribute to placemaking and wayfinding. Native plants provide food and shelter to native insects and birds, and often require less irrigation water than non-native species. [1] Perry, Bob *Landscape Plants for California Gardens* (2010)	HABITAT
	Plant Palette: Species Specific	Plants that attract a specific species support wildlife and also provide an opportunity for viewing and learning about that specific species. [1] Perry, Bob *Landscape Plants for California Gardens* (2010)	HABITAT
	Community Toolshed	Community toolsheds are on-site, secure areas for conveniently storing gardening tools and equipment. A community toolshed allows neighbors to share gardening tools, and can reduce the start-up costs of gardening for individuals. When possible, community members should be employed to build and decorate the community toolshed.	URBAN AGRICULTURE
	Vertical Agriculture/ Edible Walls or Wall-mounted Planters	Vertical agriculture or edible walls are freestanding structural systems covered in edible vegetation, either adjacent or attached to a wall, or edible vegetation directly grown on building facades. Edible plants can be grown along walls and fences in alleys that are not wide enough to accommodate planting beds. Edible walls are a form of urban agriculture and may necessitate fencing gates.	URBAN AGRICULTURE

ALLEY DEVELOPMENT ALTERNATIVES

IMAGE	FEATURE	DESCRIPTION & MORE INFO	OBJECTIVES
	Community Garden	Community gardens are areas for community members to come together to take part in cultivating vegetables and flowers. Community gardens provide access to fresh produce, educational opportunities, and a collaborative environment. Some alleys may be decommissioned to become a community garden, or vacant lots can provide ample space for them. Soil tests should be conducted to ensure soil is not contaminated and some community gardens may necessitate fencing and gates.	URBAN AGRICULTURE
	Apiary Infrastructures/ Opportunities (Bees)	Apiary infrastructure includes those elements needed for keeping beehives. In addition to producing honey, beekeeping also helps to preserve the local honeybee population. Bees are essential to ecosystems as pollinators and they can provide honey and wax for the community. Apiaries should be located where they will not be a hazard or nuisance to surrounding land uses. [1] Backwardsbeekeepers.com	URBAN AGRICULTURE
	Cisterns + Solar-Powered Pump Irrigation	Urban agriculture requires more irrigation water than native vegetation. The use of cisterns to store rainwater and solar-powered pumps can reduce the impact on natural resources and reduce operation costs.	URBAN AGRICULTURE
	Shared Use Path	Shared use paths are sidewalks and walkways within the public right-of-way that are separated from vehicle traffic and accommodate a variety of two-way nonmotorized travel. Users of shared use paths include pedestrians, runners, bicyclists, wheelchair users, and in-line skaters (Walkinginfo.org n.d.). Alley networks will ideally have both pedestrian paths and bicycle lanes to accommodate pedestrians and bicyclists; however, where bicycle lanes are not feasible, shared use paths may be considered. [1] Walkinginfo.org *Pedestrian and Bicycle Information Center*	ACCESS
	Neighborhood Greenways	Neighborhood greenways, also known as bike boulevards, are streets that prioritize pedestrians and bicyclists over vehicles. Neighborhood greenways utilize design responses, such as neckdowns and median refuge islands, to reduce traffic volumes and encourage low speeds (Jacobson & Richter 2012, City of Santa Monica 2011). [1] Jacobson & Richter *Seattle's Neighborhood Greenways Seattle Toolkit 2012* (2012)	ACCESS

ALLEY DEVELOPMENT ALTERNATIVES

IMAGE	FEATURE	DESCRIPTION & MORE INFO	OBJECTIVES
	Shared Public Way	A shared public way, also known as a shared street or the Dutch term "woonerf", is a street without curbs and sidewalks that is shared by pedestrians, bicyclists, and low-speed vehicles. To ensure that vehicles maintain a low-speed, shared public ways are typically narrow and include trees, planters, and other obstacles strategically placed to calm traffic (Walkinginfo.org n.d.). Transforming alleys into shared public ways is a useful strategy for accommodating pedestrians and bicyclists while also maintaining vehicle access. [1] Walkinginfo.org *Pedestrian and Bicycle Information Center*	ACCESS
	Pedestrian Path	Pedestrian paths or pedestrian lanes are sidewalks and walkways within the public right-of-way that are separated from vehicle traffic. Pedestrian paths are associated with reduced collisions and increased recreational opportunities, such as running, skating, riding bikes, and playing. To ensure pedestrian comfort and mobility, every street should include pedestrian paths on both sides; sidewalks are the preferred pedestrian path (Walkinginfo.org n.d.). [1] Walkinginfo.org *Pedestrian and Bicycle Information Center*	ACCESS
	Neckdown or Choker	Neckdowns or chokers are segments of the street that are narrowed by curb extensions, in which the sidewalk or curb line is extended out into the parking lane; this reduces the distance and time required for pedestrians to cross (Jacobson & Richter 2012, Walkinginfo.org n.d). Neckdowns are especially useful in alley networks at mid-block crossings where two alley segments meet and require a safe connection. [1] Jacobson & Richter *Seattle's Neighborhood Greenways Seattle Toolkit 2012* (2012); [2] Walkinginfo.org *Pedestrian and Bicycle Information Center*	ACCESS SAFETY TRAFFICCALMING
	Sharrows	Sharrows, also known as shared lane markings (SLMs), are pavement markings that indicate a travel lane is shared between bicyclists and vehicles (National Association of City Transportation Officials 2011). [1]National Association of City Transportation Officials *Urban Bikeway Design Guide* (2011)	BICYCLEINFRASTRUCTURE
	Bicycle Took Kits / Fix-it Stations	Fix-it stations are equipped with the tools needed to perform basic repairs and maintenance. Tools include screwdrivers, wrenches, Allen keys, and an air pump that are permanently tethered to a bike holder. The bike holder suspends the bike from the station's hanger arms, allowing pedals and wheels to spin freely while making repairs (www.dero.com/product-category/bike-repair/).	BICYCLEINFRASTRUCTURE

ALLEY DEVELOPMENT ALTERNATIVES			
IMAGE	FEATURE	DESCRIPTION & MORE INFO	OBJECTIVES
	Bicycle Lanes	Bicycle lanes provide a designated portion of the roadway to accommodate bicycle travel. They are indicated through striping, signage, and pavement markings, but do not have a physical barrier between the bicycle and vehicle traffic. They typically run in the same direction as the vehicle traffic, but may be configured as contra-flow lanes on low-traffic streets in order to provide a necessary connection in a bicycle route (National Association of City Transportation Officials 2011). [1]National Association of City Transportation Officials *Urban Bikeway Design Guide* (2011)	BICYCLEINFRASTRUCTURE
	Bicycle Racks / Parking	Bicycle racks support bicycle use by providing convenient, secure, and sufficient bike parking. In determining a sufficient number of bike parking spaces, the amount should equate to meeting observed needs or to accommodating a shift of 15-25% from current vehicle parking rates, whichever is greater (City of Santa Monica 2011). [1] Los Angeles City Department of Planing, *2010 Bicycle Plan: A Component of the City of Los Angeles Transportation Element* (2010)	BICYCLEINFRASTRUCTURE
	Bike Boxes	Bike boxes are designated areas at the head of traffic lanes that provide bicyclists the opportunity to wait at the front of the traffic lane, ahead of vehicles, during the red signal phase. Bike boxes increase the visibility and safety of bicyclists sharing the road with the vehicles (National Association of City Transportation Officials 2011). [1] National Association of City Transportation Officials *Urban Bikeway Design Guide* (2011)	BICYCLEINFRASTRUCTURE
	Cycle Tracks	Cycle tracks provides space for bicycle traffic that is separate from vehicle traffic lanes, parking lanes, and sidewalks. They may be one-way or two-way, and located on the street, sidewalk, or an intermediate level. Cycle tracks provide greater separation between motorists and bicyclists than bicycle lanes, and therefore offer a higher level of security and appeal to a wider spectrum of the public. (National Association of City Transportation Officials 2011) [1]National Association of City Transportation Officials *Urban Bikeway Design Guide* (2011)	BICYCLEINFRASTRUCTURE
	Intersection Crossing Markings	Intersection crossing markings are pavement markings through intersections that safely direct bicyclists across intersections and indicate to both motorists and bicyclists a clear boundary between the different modes of transportation (National Association of City Transportation Officials 2011). [1] National Association of City Transportation Officials *Urban Bikeway Design Guide* (2011)	BICYCLEINFRASTRUCTURE

ALLEY DEVELOPMENT ALTERNATIVES			
IMAGE	FEATURE	DESCRIPTION & MORE INFO	OBJECTIVES
	Two-stage Turn Queue Boxes	"Two-stage turn queue boxes offer bicyclists a safe way to make left turns at multi-lane signalized intersections from a right side cycle track or bike lane, or right turns from a left side cycle track or bike lane" (National Association of City Transportation Officials 2011, p. 87) [1] National Association of City Transportation Officials *Urban Bikeway Design Guide* (2011)	BICYCLE INFRASTRUCTURE
	Alley Intersection Markers	Alley intersection markers indicate points in the network where intersections with alleys occur and function as wayfinding and/or interpretive signage, and as alerts to drivers and pedestrians of alleys intersection approaches and crossing. Placement of alley intersection markers are especially crucial in areas of low-visibility (e.g., poor lighting, street bends, etc.)	IDENTIFICATION / WAYFINDING
	Community Branding/ Identity	Branding with unique naming, specific colors, and specific patterns are effective ways to facilitate visual identification (City of Santa Monica 2011). [1] City of Santa Monica *Bike Action Plan* (2011)	IDENTIFICATION / WAYFINDING
	Residential Entrance Markers	Residential entrance markers in alleys indicate a connection between the alley and the adjacent private property, and allow residents to acknowledge rather than ignore, this shared space. The entrance markers may contribute to territoriality by supporting increased use of the alley by the residents and their guests. This is turn encourages pedestrian and bicyclist use in the alleys and increases eyes on the street.	IDENTIFICATION / WAYFINDING

ALLEY DEVELOPMENT ALTERNATIVES

IMAGE	FEATURE	DESCRIPTION & MORE INFO	OBJECTIVES
	Overhead Element Connecting Alley Segments	Overhead elements connecting alley segments provide visual interest and indicate to alley users connections between alley segments. They may also alert drivers to alley intersection approaches and crossings, and can be incorporated as artistic features and/or landmarks.	IDENTIFICATION / WAYFINDING
	Paving: Indicates Route/ Sequence	Route or sequence indicators may be incorporated into alley paving for use as informational or wayfinding signage directed at pedestrians, bicyclists, and/or vehicles. Route or sequence indicators should be legible, consistent, and highly visible (Jacobson & Richter 2012). [1] Jacobson & Richter *Seattle's Neighborhood Greenways Seattle Toolkit 2012* (2012)	IDENTIFICATION / WAYFINDING
	Paving: Textured	Textured paving may be used in alley networks to create a unique sense of place, contribute to the character of the neighborhood, provide public art, reduce travel speeds, and/or physically indicate a pedestrian and bicyclist realm through variations in texture. Local artisans should be employed when possible.	IDENTIFICATION / WAYFINDING TRAFFICCALMING
	Plant Palette: Character	Plants of a unified character can enhance the experience of being in a place, and contribute to placemaking and wayfinding. [1] Perry, Bob *Landscape Plants for California Gardens* (2010)	IDENTIFICATION / WAYFINDING
	Signage: Directional	Directional signage within alley networks is especially important for wayfinding and directing users to nearby destinations.	IDENTIFICATION / WAYFINDING

ALLEY DEVELOPMENT ALTERNATIVES			
IMAGE	FEATURE	DESCRIPTION & MORE INFO	OBJECTIVES
	Trail Map for Network	Trail maps for each of the networks is a strategy for educating residents of the locations and orientation of newly implemented green alleys and promoting walking and bicycling. Maps should include local attractions as well as locations of amenities, such as drinking fountains and public restrooms (Walkinginfo.org n.d.). [1] Walkinginfo.org *Pedestrian and Bicycle Information Center*; [2] Feetfirst.org *Neighborhood on First Maps*; [3] Walkarlington.com *Walkabout Neighborhood Maps*	 IDENTIFICATION / WAYFINDING
	Alley Entrance Marker/ Gateway	An alley entrance marker or gateway is a physical element (i.e., signage, archways, etc.) that identifies neighborhood or commercial areas and indicates a change in environment (Walkinginfo.org n.d.). With regards to alley networks, entrance markers should be aesthetically pleasing and signal to drivers the need to reduce their speed. [1] Walkinginfo.org *Pedestrian and Bicycle Information Center*	 IDENTIFICATION / WAYFINDING
	Focal Point	A focal point located mid-alley provides visual interest to users and also provides a mid-point marker that can shorten the perceived length of the alley.	 USER COMFORT
	Reflective Features	Reflective features included in the pavement, street furniture, artwork, etc. creates visual interest and can also function as a safety feature, alerting drivers to areas where pedestrian and bicyclists may be present.	 USER COMFORT
	Shadow Interplay	Physical elements frequently found along alleys -- such as utility poles and lines, fences and walls, vegetation, and roofs -- cast shadows across the alley pavement. The location and shapes of the shadows change throughout the day and seasons. Artistic elements can be integrated with these shadows to lend increased visual interest and awareness of the passage of time. Local artisans and/or design professionals should be consulted when possible.	 USER COMFORT

ALLEY DEVELOPMENT ALTERNATIVES

IMAGE	FEATURE	DESCRIPTION & MORE INFO	OBJECTIVES
	Wind Chimes	Wind chimes can be incorporated as artistic features and audible landmarks.	USER COMFORT
	Sundial in Paving	Shade structures or other shadow-casting elements combined with markings in the pavement can serve as a sundial, and a point of interest in the community.	USER COMFORT
	Chicanes	Chicanes shift the travel lane, creating turns in otherwise straight street sections, in order to reduce speeds. For traffic calming, the extent of the shift should reflect the desired speed and a sign stating the desired speed should be posted prior to the chicane (Walkinginfo.org). [1] Walkinginfo.org *Pedestrian and Bicycle Information Center*	TRAFFIC CALMING
	Advance Stop Bar	An advance stop bar signals drivers to stop 4 feet in advance of pedestrian crossings. This improves the visibility for both pedestrians and drivers and allows more time in which to assess each other's intentions. At midblock marked crosswalks in particular, the improved visibility from an advance stop bar can help prevent collisions and fatalities (walkinginfo.org n.d.). [1] Walkinginfo.org *Pedestrian and Bicycle Information Center*	TRAFFIC CALMING
	Speed Bumps	Speed bumps, also known as speed humps, are bumps in the street implemented to cause drivers to temporarily reduce their speed. They can be uncomfortable for bicyclists to traverse (Jacobson & Richter 2012). [1] Jacobson & Richter *Seattle's Neighborhood Greenways Seattle Toolkit 2012* (2012)	TRAFFIC CALMING

ALLEY DEVELOPMENT ALTERNATIVES			
IMAGE	FEATURE	DESCRIPTION & MORE INFO	OBJECTIVES
	Speed Tables	Speed tables are raised crosswalks that cause drivers to reduce their speed (Jacobson & Richter 2012). Speed tables are especially important to have at mid-block crossings connecting alley segments, and can be combined with neckdowns. [1] Jacobson & Richter *Seattle's Neighborhood Greenways Seattle Toolkit 2012* (2012)	TRAFFIC CALMING
	Crosswalk Markings	Crosswalks markings alert drivers to locations of pedestrian crossings and indicate to pedestrians optimal or preferred locations for them to cross. It is recommended that crosswalk markings known as the "ladder" or "zebra" markings be used due to their high visibility (Walkinginfo.org). Signage alerting drivers to yield or stop for pedestrians is ideal. [1] Walkinginfo.org *Pedestrian and Bicycle Information Center*	SAFETY
	Mailboxes	Locating mailboxes in alleys will help increase the use of alleys, and thereby increase their safety. Mail carriers will regularly be traveling down alleys to deliver the mail, and "eyes on the street" are further increased as residents go out to the alley to check their mail.	SAFETY
	Median Refuge Islands	Median refuge islands, also known as crossing islands, center islands, or median slow points, are raised islands or medians located in the center of streets, at intersections or mid-block, to aid pedestrians and bicyclists in safely crossing the street. The pedestrian refuge island works by allowing pedestrians and bicyclists to navigate one direction of traffic at a time. Median refuge islands are especially important to include at those crossings without a traffic signal or stop sign (Walkinginfo.org). [1] Walkinginfo.org *Pedestrian and Bicycle Information Center*; [2] National Association of City Transportation Officials *Urban Bikeway Design Guide* (2011)	SAFETY TRAFFIC CALMING
	Pedestrian Scramble	A pedestrian scramble, also known as an 'X' crossing, diagonal crossing, or pedestrian scramble phase, refers to an intersection where vehicle traffic is stopped in all four directions to allow pedestrians to cross in all directions, including diagonally. Pedestrian scrambles reduce collisions because pedestrian traffic and vehicle traffic are prevented from occurring at the same time.	SAFETY TRAFFIC CALMING

ALLEY DEVELOPMENT ALTERNATIVES			
IMAGE	FEATURE	DESCRIPTION & MORE INFO	OBJECTIVES
	Speed Dips	Speed dips are dips in the street implemented to cause drivers to temporarily reduce their speed, but can be uncomfortable for bicyclists to traverse (Jacobson & Richter 2012). [1] Jacobson & Richter *Seattle's Neighborhood Greenways Seattle Toolkit 2012* (2012)	 TRAFFIC CALMING
	Traffic Calming Circles	Traffic calming circles are small roundabouts located at four-way intersections, typically in residential neighborhoods, that cause drivers to reduce their speed (Washington State Department of Transportation 2012). [1] Washington State Department of Transportation Safety (2012) at www.wsdot.wa.gov/safety/roundabouts/basicfacts.htm	 TRAFFIC CALMING

APPENDIX B
POLICY ANALYSIS AND RECOMMENDATIONS

This policy review focused on seven topics related to completing green alley projects. The framework for this review was borrowed from the United States Environmental Protection Agency (EPA), where questions were presented then answered through the lens of Los Angeles' existing policy. The initial questions were informed by the EPA's 2013 evaluation of green infrastructure barriers and opportunities in Phoenix, Arizona, which involved the use of two existing tools (Tetra Tech's Green Infrastructure Opportunity Checklist Tool and the EPA Water Quality Scorecard) (US EPA 2013). In addition, the Green Infrastructure Identification of Barriers and Opportunities Checklist Tool, a Los Angeles specific adaptation of Tetra Tech's Green Infrastructure Opportunity Checklist Tool (Council for Watershed Health 2013) was consulted. Both the EPA Water Quality Scorecard and the Green Infrastructure Identification of Barriers and Opportunities Checklist Tool are included in Appendix L of this document.

Derived from the aforementioned tools, four pertinent topics were selected:

1. Minimizing effective or connected impervious areas
2. Restore and enhance the hydraulic function of unpaved areas
3. Harvest rain to enhance potable and non-potable water supply
4. Allow and encourage multi-use stormwater controls

Following the inclusion of the first four topics, an additional three topics identified as key components for the implementation and success of green alleys in the South Los Angeles Area were added. These are:

5. Alley gating, access, and decommissioning
6. Urban agriculture and healthy food
7. Green alley maintenance

Beyond identifying Los Angeles' existing policy and codes, and making it readily available in the South Los Angeles Green Alleys Master Plan (AMP), the second purpose of this study was to identify gaps in existing policy and make recommendations for new policy and incentives that support green alley projects.

A summary of issues related to the seven identified topics is presented here with the purpose of providing insight on how these topics relate to greening of South Los Angeles' alleyways. Following that, for each key topic, key questions that pertain directly to the implementation of green alley work are listed with findings from existing City of Los Angeles policy and codes. Suggestions for policy amendments, expansions, and additions are included and each is prioritized in terms of its applicability to green alley work. Figure B.1 shows the symbology used to prioritize policy and code findings.



FIGURE B.1
DEGREE OF IMPORTANCE KEY TO SYMBOLS

TOPIC 1: MINIMIZING EFFECTIVE OR CONNECTED IMPERVIOUS AREAS

Objectives:
Minimize impervious area associated with streets, parking, driveways, and sidewalks.
Cluster development.
Incorporate sustainable hydrology practices into urban redevelopment.

Summary of issues:
Given that water runoff, exacerbated by impervious surfaces, is a major cause of water pollution, maximizing pervious areas and preventing runoff are strategies that policy and code changes can support. In Los Angeles, the Stormwater Low Impact Development (LID) Ordinance supports these goals. There is an associated Best Management Practices Handbook that serves as a guide to solutions for all permitted development and redevelopment. Generally, the policies reviewed for this topic are supportive of green alleys work in Los Angeles, though more could be done to incentivize their creation.

The Los Angeles Department of City Planning also has Green Streets Policy Recommendations, and these do allow, encourage, or require design elements that green alleys tend to provide (such as alternative and porous paving surface materials). These programs have elements that could facilitate and support the design of green alleys programs. Currently, several green streets and green alleys projects are completed or underway in Los Angeles, including Elmer Avenue Neighborhood Green Street, Elmer Paseo Green Alley, Hollywood and Cosmo Infiltration Alley, Vermont Avenue Green Street, Riverdale Avenue Green Street, and Oros Green Street. The lessons learned from these pilots have been evaluated and integrated into these specific planning and policy documents.

It should be noted, however, that some of Los Angeles' guidelines for stormwater infiltration do make it difficult to disconnect impervious areas within alleys. In "Appendix K: City of Los Angeles Department of Building and Safety Guidelines for Stormwater Infiltration," design requirements state that the minimum distance between an infiltration facility and the adjacent private property line or foundations shall be ten feet. Given that few alleys are greater than 20 feet wide, it becomes difficult and costly to install infiltration within them, as the only way to meet this requirement is to bury the infiltration system at a great depth. A potential exception is for grassy swales, which can be located a minimum of five feet from a property line or building (City of Los Angeles Bureau of Sanitation 2011).

Key Question	Los Angeles Finding	Recommendations	Degree of Importance
Does the code distinguish between pervious paved areas and impervious paved areas in the determination of onsite stormwater requirements?	Yes: The Stormwater LID Ordinance applies to all permitted development and redevelopment. All permitted development and redevelopment must comply with the standards and requirements of the Development Best Management Practices Handbook. *§ Ordinance 181899: Amending Sections 64.70.01 and 64.72 of Article 4.4 of Chapter VI*	None.	●
Does the code definition of impervious area distinguish between impervious area connected to the storm drain system versus impervious area that is not?	No.	Distinguish connected impervious areas connected or adjacent to storm drain systems from disconnected impervious areas in order to determine stormwater capture design parameters in the Stormwater LID Ordinance. For example, areas with no storm drains may be designed to reduce flooding while those containing or adjacent to stormdrains may benefit from diverting collected storm flows.	○

TOPIC 1: MINIMIZING EFFECTIVE OR CONNECTED IMPERVIOUS AREAS (cont.)			
Key Question	**Los Angeles Finding**	**Recommendations**	**Degree of Importance**
Are curb bumpouts/ extensions allowed near intersections and mid-block for traffic-calming and bioretention opportunities?	Yes: Curb extensions/bumpouts are allowed for traffic calming measures and could accommodate biorention. The City of Los Angeles Draft Green Streets Policy includes 'bioretention curb extensions' as a design element and they are included in the Green Street Standard Plans. § *City of Los Angeles Green Street Standard Plans: http://eng.lacity.org/techdocs/stdplans/s-400/s-484-0.pdf* § *LA Dept. of City Planning: Residential Citywide Design Guidelines: http://planning.lacity.org/PolicyInitiatives/UrbanDesign/ResidentialDesignGuidelinesHighRes_6_23_2011.pdf* § *LA Dept. of City Planning, DRAFT Green Streets Policy Recommendations: http://www.waterboards.ca.gov/losangeles/water_issues/programs/stormwater/municipal/watershed_management/san_gabriel/east_san_gabriel/grnstspolicy.pdf*	None.	●
Are grass swales or bioretention swales allowed instead of curb and gutter or with curb cuts (where slopes allow)?	Yes: The recently adopted MS4 permit requires permitees that elect to participate in a Watershed Management Program to demonstrate that there are green street policies in place. One of the design elements is to "treat and convey runoff using swales (versus standard curb and gutter)." § *LA Draft Green Streets Policy: http://www.waterboards.ca.gov/losangeles/water_issues/programs/stormwater/municipal/watershed_management/san_gabriel/east_san_gabriel/grnstspolicy.pdf*	None.	●
Are bioretention areas, swales, and other green infrastructure techniques allowed to replace the required "planting strip" or "parkway area" between the sidewalk and curb?	Yes: The Green Street Standard Plans include guidelines for bioretention areas and swales in parkways in major/secondary highways, local/connector streets and street without street parking. § *City of Los Angeles Green Street Standard Plans: http://eng.lacity.org/techdocs/stdplans/s-400/s-481-0.pdf* § *City of Los Angeles Green Street Standard Plans: http://eng.lacity.org/techdocs/stdplans/s-400/s-482-0.pdf* § *City of Los Angeles Green Street Standard Plans: http://eng.lacity.org/techdocs/stdplans/s-400/s-483-0.pdf*	None.	○

TOPIC 1- MINIMIZING EFFECTIVE OR CONNECTED IMPERVIOUS AREAS (cont.)			
Key Question	**Los Angeles Finding**	**Recommendations**	**Degree of Importance**
If there are cul-de-sacs or roundabouts, are landscaped islands or bioretention islands allowed or encouraged?	Partial: The LA Department of Public Works LID Standards Manual specifies that bioretention areas can be applied in various settings, including areas within loop roads or cul-de-sacs, however, alleys are not specifically designated. § *LA Dept. of Public Works Low Impact Development Standards Manual http://dpw.lacounty.gov/BSD/lib/fp/Drainage%20and%20Grading/General%20Documents/LA%20County%20LID%20Manual%20(1-26-2009).pdf*	Expand language in the LID Standards Manual to specify alleys as "various setting" where landscaped and/or bioretention areas are allowed.	●
Are bioretention cells allowed in parking medians?	Yes: Bioretention areas can be applied in various settings, including landscaped parking lot islands, however, alleys are not specifically designated. § *LA Dept. of Public Works Low Impact Development Standards Manual http://dpw.lacounty.gov/BSD/lib/fp/Drainage%20and%20Grading/General%20Documents/LA%20County%20LID%20Manual%20(1-26-2009).pdf*	Expand language in the LID Standards Manual to include alleys as part of the 'various settings' where bioretention areas can be applied.	●
Are pervious surfaces such as paver stones, porous pavement, or other pervious pavers allowed in alleys?	Partial: Alternative paving materials (porous asphalt, porous concrete, permeable interlocking concrete pavers – min. thickness of 80mm, permeable pavers, porous paving, decomposed granite – only for driveways and parking, crushed rock, gravel, and restrained systems) are permitted for use in every parking area, automobile storage area, automobile, manufactured home or trailer sales area, and driveways. Any product installed within areas designated by the Fire Department as fire lane must be approved by the Fire Department. If plantings are an element of the alternative paving material, the irrigation system shall not utilize potable water except for plant establishment. Interlocking pavers are allowed in vehicular and pedestrian alleys. § *LAMC 12.21A6(c); LA Ordinance #182431 http://clkrep.lacity.org/onlinedocs/2011/11-1331_ord_182431.pdf* § *City of Los Angeles Green Street Standard Plans*: http://eng.lacity.org/techdocs/stdplans/s-400/s-485-0.pdf § *City of Los Angeles Green Street Standard Plans*: http://eng.lacity.org/techdocs/stdplans/s-400/s-486-0.pdf	Expand City of Los Angeles Municipal Code to include alleys as a location where alternative paving materials can be applied.	●

TOPIC 1: MINIMIZING EFFECTIVE OR CONNECTED IMPERVIOUS AREAS (cont.)			
Key Question	**Los Angeles Finding**	**Recommendations**	**Degree of Importance**
Is Conservation or Open Space Design an option?	Unknown/Not addressed.	Expand language in the LID Standards Manual to include green alley development as credit towards open space development requirements. Further, incentivize developers to create alley open space in underserved communities that are park poor with few transportation options and incentivize developers to create networks of connected spaces that facilitate active transportation and recreation.	●
Are infiltration facilities allowed adjacent to private property lines or foundations?	No: Grassy swales and rain gardens are allowed 5 feet from a property line or building. Infiltration facilities are to be a minimum of 10 feet from a property line or building. § *LA Dept. of Public Works Rainwater Harvesting Program: http://www.lastormwater.org/wp-content/files_mf/homeowner_howto_guide.pdf* § *LID BMP Handbook*	Expand language in the LID Standards Manual to provide criteria for impermeable swales, rain gardens, and infiltration planters for the purpose of diverting water to infiltration areas.	●

TOPIC 2: RESTORE AND ENHANCE THE HYDRAULIC FUNCTION OF UNPAVED AREAS

Objectives:
Minimize building footprint/envelope area.
Preserve topsoil structure, sensitive wetlands and washes, sensitive soils, and sensitive stream buffers.

Summary of issues:
Similar to Topic 1, the Los Angeles Low Impact Development Ordinance provides language that is supportive of the creation of unpaved green alleys. For instance, the ordinance suggests "maximizing trees and other vegetation at the site by planting additional vegetation, clustering tree areas, and promoting the use of native and/or drought tolerant plants." The Green Building Code also provides elements of support. However, apart from a few directly related items in the Green Building Code, there is a lack of required actions or incentives to undertake green alleys work to support the hydraulic function of unpaved areas.

Key Question	Los Angeles Finding	Recommendations	Degree of Importance
Are site designs required to preserve existing runoff pathways to provide maximum drainage and flood control using natural drainage patterns, including washes?	Yes: The following measures should be implemented to provide erosion protection to unlined receiving streams on the project site: 1. Utilize natural drainage systems to the maximum extent practicable, but minimize runoff discharge to the maximum extent practicable. *§ LID BMP Handbook*	None.	●
Is a 50-foot wetland buffer required/ encouraged?	Partial: Not required yet. Draft policy for 100ft. buffers for natural streams. *§ Proposed Ordinance for Stream Protection: http://smmc.ca.gov/pdf/attachment580_Attachment%201.pdf*	Adopt policy for 100ft. buffers for natural streams. Expand ordinance to include 50ft. buffers for wetlands.	○

TOPIC 3: HARVEST RAIN TO ENHANCE POTABLE AND NON-POTABLE WATER SUPPLY

Objectives:

Through plumbing code provisions, enhance rainwater harvesting and water conservation.
Through building and zoning codes, allow the use of rooftop runoff disconnection and rainwater harvesting by routing rainwater to natural and landscaped areas throughout the site.

Summary of issues:

This topic is most widely and strongly encouraged in Los Angeles. There are a variety of programs that already address this issue. For instance, the LID Best Management Practices Handbook encourages the use of planter boxes, rain gardens, cisterns, and rain barrels - all of which could be applicable to green alleys design work. In another example, the County of Los Angeles Low Impact Development Standards Manual requires that all new development and redevelopment under the jurisdiction of the County of Los Angeles is required to meet LID requirements. Green alleys are certainly a tool that could be used to accomplish this.
There are also elements of other codes that, while they do not directly mention green alleys work, their intentions are supportive. For instance, the Los Angeles Plumbing Code does allow the utilization of nonpotable water systems (such as captured rainwater) to supply water closets, urinals, and other allowed uses. These systems could also be incentivized through codes, as they may be used in the calculations demonstrating reductions in water use.

Key Question	Los Angeles Finding	Recommendations	Degree of Importance
Are exterior cisterns allowed?	Yes: Cisterns are allowed for reuse of untreated rainfall/ non-potable cistern water and urban run-off water for onsite landscape irrigation purposes. § *www.publichealth.lacounty.gov/eh/docs/ep_cross_con_cistern.pdf*	Specify criteria in the Requirements for the Installation and Pipeline Construction for Safe and Reuse of Rainfall/Run-Off, Non-Potable Cistern Water and Urban Run-Off Water that will permit placement of a cistern within an alley	○
Is a BMP maintenance plan required?	Yes: A Standard Urban Stormwater Mitigation Plan is required. This requires installation and maintenance of post-construction BMPs on qualifying properties. However, there is no requirement expressly stated in the plumbing code. § *Low Impact Development Final Ordinance: http://www.lastormwater.org/wp-content/files_mf/finallidordinance181899.pdf*	Expand The Low Impact Development Guidelines to include requiring maintenance plans for cisterns and other BMPs within alleys.	○
Can rain barrels be placed within standard zoning setback areas?	Partial: Not expressly allowed or prohibited. Rain barrels must be placed away from retaining walls because of their weight.	Specify criteria for placement of rain barrels and above ground cisterns within zoning setback areas within an alleys.	○

TOPIC 3: HARVEST RAIN TO ENHANCE POTABLE AND NON-POTABLE WATER SUPPLY (cont.)			
Key Question	**Los Angeles Finding**	**Recommendations**	**Degree of Importance**
Can rooftop runoff be disconnected and distributed throughout the site via contours and drainageways to discharge into natural areas or landscape areas within alleys?	Yes: Low Impact Development requirements: All new development and redevelopment under the jurisdiction of the County of Los Angeles is required to meet LID requirements. The goals of LID are to increase groundwater recharge, enhance water quality, and prevent degradation to downstream natural drainage courses. Downspout routing: Each roof downspout shall be directed to one of the following BMPs. The sum of the capacity of the downspout BMPs shall be at least 200 gallons. a. Cistern/rain barrel - Direct roof downspouts to rain barrels or cisterns. The stored stormwater can then be used for irrigation or other nonpotable uses as permitted under the Los Angeles County Building/Plumbing Code. b. Rain garden/planter box - Direct roof downspouts to rain gardens or planter boxes that provide retention and treatment of stormwater § *County of Los Angeles Low Impact Development Standards Manual: http://dpw.lacounty.gov/BSD/lib/fp/Drainage%20and%20Grading/General%20Documents/LA%20County%20LID%20Manual%20(1-26-2009).pdf*	Create developer incentives to implement systems that direct rooftop runoff to landscaped areas, including streetscapes and green alleyways where biorention has been installed.	○

TOPIC 4: ALLOW AND ENCOURAGE MULTI-USE STORMWATER CONTROLS

Objectives:
Allow and encourage stormwater controls as multiple use in open space areas and in landscaped areas.

Summary of issues:
A major barrier to green alley programs can be that codes actually serve as a hindrance to their creation. In Los Angeles, however, the Low Impact Development Ordinance and Public Resources Code serve as two policies that actually allow and encourage alternative stormwater management and control. Many of the guidelines within each of these documents relate to stormwater controls in open space and landscape areas. This is an important element that enabling green alley programs that already exist in Los Angeles.

Key Question	Los Angeles Finding	Recommendations	Degree of Importance
Does the code and zoning ordinance allow or promote development of an urban tree canopy?	Yes: Reduction of Heat Island Effect for Nonroof Areas. Reduce nonroof heat islands for 50% of sidewalks, patios, driveways or other paved areas by using one or more of the methods listed. 1. Trees or other plantings to provide shade and that mature within 15 years of planting. Trees shall be suitable in mature size and environmental requirements for the site. Tree selection and placement should consider location and size of areas to be shaded; location of utilities; views from the structure; distance to sidewalks and foundations; overhangs onto adjacent properties and streets; other infrastructure and proximity to landscaping. In addition, shading shall not cast a shadow, as specified, on any neighboring solar collectors. § *MC Chapter IX, article 9 and Public Resources Code Section 25981, et seq. (Solar Shade Control Act)*	Expand the Bureau of Street Services approved street tree list to include information on which trees are particularly appropriate for planting within alleys and in stormwater BMPs.	○
Are bioretention areas allowed to be constructed in the development's designated landscape areas, if properly designed?	Yes: The order of priority specified below shall apply to all projects categorized as "all other developments" in accordance with Section 3.1.3. Each type of BMP shall be implemented to the maximum extent feasible when determining the appropriate BMPs for a project. 1. Infiltration Systems 2. Stormwater Capture and Use 3. High Efficiency Biofiltration/Bioretention Systems 4. Combination of Any of the Above § *LID BMP Handbook*	Include alleys in the LID BMP Handbook as designated landscape areas where listed BMPs can be applied.	●
Are bioretention areas given "credit" as landscape area to count as a percent of the required landscaping?	Unknown/Not addressed.	Expand City of Los Angeles Municipal Code to include a "credit" for bioretention areas as landscape area to count as a percent of required landscaping.	○

TOPIC 4: ALLOW AND ENCOURAGE MULTI-USE STORMWATER CONTROLS (cont.)			
Key Question	**Los Angeles Finding**	**Recommendations**	**Degree of Importance**
Are landscaping plans required to consider less water-intensive, native vegetation?	Yes: Soil and vegetation to be incorporated in infiltration facilities shall be selected by a licensed landscape architect. In general, drought and flood resistant plant species native to California should be selected when possible. § *LID BMP Handbook*	None.	○
Do landscaping requirements allow plantings conducive to bioretention, bioswales, raingardens , and other Green Infrastructure BMPs?	Yes: Projects that have demonstrated they cannot manage 100% of the water quality design volume onsite through infiltration and/or capture and use BMPs may manage the remaining volume through the use of a high removal efficiency biofiltration/ biotreatment BMP. A high removal efficiency biofiltration/ biotreatment BMP shall be sized to adequately capture 1.5 times the volume not managed through infiltration and/or capture and use. Biofiltration BMPs are landscaped facilities that capture and treat stormwater runoff through a variety of physical and biological treatment processes. § *LID BMP Handbook*	None.	●
If irrigation is required, are weather-based irrigation controls required?	Partial: In the Municipal Code, when automatic irrigation system controllers for landscaping are provided and installed at the time of final inspection, the controllers shall comply with the following: 1. Controllers shall be weather- or soil moisture-based controllers that automatically adjust irrigation in response to changes in plants' needs as weather conditions change; 2. Weather-based controllers without integral rain sensors or communication systems that account for local rainfall shall have a separate wired or wireless rain sensor which connects or communicates with the controller(s). Soil moisture-based controllers are not required to have rain sensor input. It should be noted that when landscaping is used in conjunction with projects that involve pervious surfaces such as paver stones, or other pervious pavers the irrigation system shall not utilize potable water except for plant establishment. § *MC Chapter IX, article 9* § *LAMC 12.21A6(c); LA Ordinance #182431 http://clkrep.lacity.org/onlinedocs/2011/11-1331_ord_182431.pdf*	None.	○

TOPIC 4: ALLOW AND ENCOURAGE MULTI-USE STORMWATER CONTROLS (cont.)			
Key Question	**Los Angeles Finding**	**Recommendations**	**Degree of Importance**
Are Green Infrastructure structural techniques such as constructed wetlands, swales, and bioretention areas allowed to be constructed in a development's designated open space, if properly designed?	Yes: 1. The following uses and activities when conducted in accordance with the limitations hereafter specified. (vi) Water conservation areas, including percolation basins and flood plain areas. § *Section 1 article 2, section 12.04.05*	Expand City of Los Angeles Municipal Code to designate green alleys as open space.	●
Are Green Infrastructure structural techniques such as constructed wetlands, swales, and bioretention areas given "credit" as open space to count as a percent of the required open space area, if properly designed?	Unknown/Not addressed.	Expand City of Los Angeles Municipal Code to include a "credit" for green infrastructure techniques such as swales and biorention areas to count as a percent of the required open space area when properly designed.	◎
Are there open space preservation requirements or incentives?	Yes: The following regulations shall apply in the "OS" Open Space Zone: A. Purpose. It is the purpose of the "OS" Open Space Zone to provide regulations for publicly owned land in order to implement the City's adopted General Plan, including the recreation, parks and open space designations in the City's adopted district and community plans, and other relevant elements, including the Open Space, Conservation and Public Recreation Elements. § *MC Chapter I, article 2.* § *SEC. 12.04.05. "OS" OPEN SPACE ZONE. (Added by Ord. No. 166,168, Eff. 10/3/90.)* § *Later in the zoning code, different zoning types require open space* *e.g. Open Space Requirement for Six or More Residential Units. (Added by Ord. No. 171,753, Eff. 11/17/97.)*	None.	○

TOPIC 3: ALLEY GATES, ACCESS AND DECOMMISSIONING

Objectives:
Provide and maintain access to alleys
Promote the use of alleys by pedestrians and bicyclists

Summary of issues:
Approximately 11,000 alleys were gated beginning in 1993 through the City of Los Angeles Nuisance Alley Abatement Program. In 2004 the State of California ruled the program illegal though many gates still remain.

While alleys may not be legally closed to public access, they may be allowed to restrict vehicular access. Bollards may be installed, but must be removable and the alley design must still be able to support vehicle traffic (City of Los Angeles Green Streets Committee 2012).

The use designation of alleys may be changed through decommissioning or the 1960 Pedestrian Mall Law (the Avalon Green Alley project is a precedent in Los Angeles for the conversion of an alley to a pedestrian mall). If the use designation of an alley is not changed, current public access and use of alleys must be maintained. Alleys are public easements for public access. If public access is prevented, landowners have the right to take the property for private use (City of Los Angeles Green Streets Committee 2012). The City of Los Angeles provides temporary closure permits that allow closure for a maximum of 30 days, and Pilot Project permits that will allow closure for up to one year (City of Los Angeles Green Streets Committee 2012, City of Los Angeles Bureau of Street Services 2009).

Key Question	Los Angeles Finding	Recommendations	Degree of Importance
Can alley gates legally be installed?	No: In 2004 the State of California ruled the program illegal. Presently, while the City no longer installs new gates, many still remain with varied signs of use and function.	None.	○
Can alleys be close permanently to vehicular traffic?	Yes: The California State Pedestrian Mall Law of 1960, Part 1 of Division 13 of the Streets and Highways Code allows for the conversion of alleys into pedestrian-only spaces and restricts vehicle access in a public street including alleys.	None.	●
Are alleys currently used as priority areas for bike travel?	No: Bicycle infrastructure is currently not being installed in alleys ways.	When adopting city-wide transportation plans, consider alleys as part of circulation routes. In addition, specify the criteria in the City of Los Angeles Municipal Code to allow for distinguishable bicycle parking in alleys	○
Are diverse and varying uses of alleys allowed? (i.e., for gatherings or events)?	Unknown/Not addressed.	Expand the City of Los Angeles Municipal Code to include formal permits for the use of alleys as temporary "flexible spaces" for community gathering and/or events.	○

TOPIC 6: URBAN AGRICULTURE & HEALTHY FOOD

Objectives:
Utilize alleys as a space for urban agriculture and the distribution of healthy food

Summary of issues:
The Los Angeles Food Policy Council researches and provides recommendations for policies that relate to the healthy food system in Los Angeles, and could be a helpful resource and partner for facilitating the use of alleys for urban agriculture. One of the policies identified that affect urban agriculture and access to healthy food in alleys, is the 2011 amendment to the Los Angeles Municipal Code that permits farmer's markets to be located anywhere within a residential zone (Los Angeles Food Policy Council 2015). This policy supports the concept of holding farmer's markets in residential alleys, making the markets more directly accessible to people.

Graduate students from the UCLA Luskin School of Public Affairs completed a comprehensive study of urban agriculture in Los Angeles County. Their 2013 report includes a written summary and reference chart of the City of Los Angeles' regulations that pertain to urban agriculture (Jackson et al 2013).

In 2014, two Los Angeles City Council members put forth a motion to give tax breaks to landowners who lease vacant property for agriculture. The vision is to help convert blighted vacant properties into local healthy food resources within the communities that need them most (Jennings 2014). This policy provides an incentive that supports the AMP's recommendation to utilize vacant lots in conjunction with green alley and green street development.

The Los Angeles City Council recently adopted a motion allowing edible plants within parkways in residential zones. This ordinance includes language indicating that a new Residential Parkway Landscaping Guideline would be adopted by the board and include accepted edible plants that would not require a permitting process. At the time of writing, this guideline has not been made available publicly. In addition, it is unclear if planted strips in alleys would be included under the umbrella of a parkway designation.

Key Question	Los Angeles Finding	Recommendations	Degree of Importance
Are farmer's markets allowed in alleys?	Yes: The Los Angeles Municipal Code permits farmer's markets to be located anywhere within a residential zone and in all commercial zones with the exception of commercial manufacturing zones. *§ LAMC 12.27 14(a); LA Ordinance #161535 http://clkrep.lacity.org/onlinedocs/1980/80-5526_ORD_161535_07-15-1986.pdf*	None.	○
Are edible plants allowed in planting strips in alleys?	The Los Angeles City Council recently adopted a motion allowing edible plants within parkways in residential zones. This ordinance includes language indicating that a new Residential Parkway Landscaping Guideline would be adopted by the board and include accepted edible plants that would not require a permitting process. At the time of writing this guideline has not been made available publicly. In addition, it is unclear if planted strips in alleys would be included under the umbrella of a parkway designation. *§ LAMC 62.169(b); LA Ordinance #183474 http://clkrep.lacity.org/onlinedocs/2013/13-0478_ord_183474.pdf*	Expand the City of Los Angeles Municipal Code definition of acceptable areas for edible planting to include planted strips in alley ways.	○

TOPIC 7: GREEN ALLEY MAINTENANCE

Objectives:
Provide for post green alley implementation maintenance
Identify potential city-wide maintenance programs

Summary of issues:
Public funding for alley maintenance is extremely limited. The Bureau of Street Services is responsible for alley paving and illegal dumping and the Bureau of Sanitation is responsible for trash collection. With the City's adoption of green alley infrastructure design standards (as presented in the AMP), the Bureau of Street Services current responsibility of maintaining street trees and vegetation in medians and parkways could be expanded to include green alleys. In addition, the Bureau of Sanitation who is now responsible for maintaining grey, green, and wastewater infrastructure could oversee the maintenance of green alleys' stormwater capture and treatment programs.

Despite the few existing maintenance opportunities and those that could be tapped into, City agencies need to become more integrated to handle large-scale, green infrastructure efforts. The Green Streets Committee and the Green Alley Subcommittee are bringing about interagency awareness of green infrastructure issues; however Los Angeles does not have an agency specifically set up to spearhead green infrastructure and to resolve issues. New York City's Department of Environmental Protection is an example of an agency specifically dedicated to the implementation of the NYC Green Infrastructure Plan.

In addition to what the City is currently providing and can potentially provide, The Trust for Public Land's Avalon Green Alley Demonstration Project has shown that posting No Dumping signs and educating neighbors on Bulky Item Pickup does help. Engaging residents in the beautification of their neighborhood and inspiring them to become stewards will help to maintain green alleys.

Key Question	Los Angeles Finding	Recommendations	Degree of Importance
To what degree are alleys currently being maintained?	Bureau of Street Services is responsible for alley paving and illegal dumping, and the Bureau of Sanitation is responsible for trash collection. On average, alleys are cleaned once per year.	City of Los Angeles to adopt Green Infrastructure Design Guidelines for alleys, thereby expanding the Bureau of Street Services' responsibility of street tree and parkway and median vegetation maintenance to include alleys.	●
Are their existing services for the maintenance of grey, green, and wastewater infrastructure?	Yes: the Bureau of Sanitation is responsible for maintaining grey, green and wastewater infrastructure.	Expand the Bureau of Sanitation's responsibilities to include stormwater capture and treatment BMPs within green alleys. Ex. BOS is responsible for BMP maintenance at the Avalon Green Alley Network Demonstration Project.	○
Does the City of Los Angeles have one cohesive agency for overseeing green infrastructure and resolving related issues?	No: the City of Los Angeles does not have an agency specifically dedicated to green infrastructure at this time. New York City's Department for Environmental Protection can serve as a good example of such an agency.	Explore integrated management models to facilitate a more coordinated approach to building and maintaining green alleys and other green infrastructure projects. An outcome could be formalizing the existing green streets committee structure to carry out this role.	●
Is a maintenance program required to be established, indicating who will be maintaining the Green Alley, prior to City approval of Green Alley implementation?	Yes: Under the Los Angeles Low Impact Development ordinance and guidance it is required that A Standard Urban Stormwater Mitigation Plan be in place for the installation and maintenance of post-construction BMPs on qualifying properties. § *LID BMP Handbook*	None.	○

APPENDIX C

POTENTIAL GREEN ALLEY PROJECT FUNDING SOURCES

EXISTING GRANT PROGRAMS				
PROGRAM	AMOUNT	FUNDING POTENTIAL	DESCRIPTION AND REQUIREMENTS	MORE INFORMATION
GRANTING AGENCY: CalRecycle				
Illegal Disposal Site Abatement Grants	$500,000	• SAFE CONNECTIONS • MANAGEMENT + MAINTENANCE	• Funds provided for projects that accelerate the pace of cleanup, restore sites, and create opportunities for tomorrow. • Matching funds program. • Applicants must partner with a public entity. • There have been application cycles three times annually since 2012.	http://www.calrecycle.ca.gov/LEA/GrantsLoans/SolidWaste/LEA/default.htm
GRANTING AGENCY: California Coastal Conservancy				
Climate Ready Grants	$500,000	• URBAN GREENING + COOLING • STORMWATER CAPTURE AND TREATMENT	• Currently funded through sunsetting Prop. 84. • May have future with passage of Prop. 1.	http://scc.ca.gov/2013/04/24/grant-opportunities/
GRANTING AGENCY: California Strategic Growth Council				
California River Parkways Grants		• STORMWATER CAPTURE + TREATMENT	• This program grants funds for river parkway acquisition or development projects that meet at least 2 of 5 statutory conditions: recreation, habitat, flood management, conversion to a river parkway, and/or conservation and interpretive enhancement. • Currently funded through sunsetting Prop. 84. • May be replaced/revived with funding from the water bond.	http://bondaccountability.resources.ca.gov/Program.aspx?ProgramPK=22&Program=California%20River%20Parkways%20Program&PropositionPK=4
Environmental Enhancement and Mitigation Grants	$500,000	• URBAN GREENING + COOLING • USABLE OPEN SPACE	• For acquisition, restoration, or enhancement of resource lands (watersheds, wildlife habitat, wetlands, forests, or other significant natural areas) to mitigate the loss of or detriment to such lands within or near the right of way for transportation improvements. • No matching funds required.	http://resources.ca.gov/bonds_and_grants/eemp/
Affordable Housing and Sustainable Communities Grants	Unknown	• URBAN GREENING + COOLING • USABLE OPEN SPACE • STORMWATER CAPTURE + TREATMENT • SAFE CONNECTIONS	• Funds land-use, housing, transportation, and land preservation projects to support infill and compact development that reduces greenhouse gas ("GHG") emissions.	http://sgc.ca.gov/docs/AHSC_Background_Information.pdf

PROGRAM	AMOUNT	FUNDING POTENTIAL	DESCRIPTION AND REQUIREMENTS	MORE INFORMATION
GRANTING AGENCY: National Park Service				
Land and Water Conservation Fund Grants	Unknown	• USABLE OPEN SPACE • SAFE CONNECTIONS	• Federal (National Parks Service) funding originating from offshore oil and gas drilling. • For park creation through acquisition or development that encourages people to get outside, especially in underserved communities. • Annual awards.	http://www.parks.ca.gov/?page_id=21360
GRANTING AGENCY: Environmental Protection Agency				
Urban Waters Small Grants	$60,000	• STORMWATER CAPTURE + TREATMENT • MANAGEMENT + MAINTENANCE • COMMUNITY OUTREACH	• Funds research, investigations, experiments, training, surveys, studies, and demonstrations that will advance the restoration of urban waters by improving water quality through activities that also support community revitalization and other local priorities.	http://www2.epa.gov/urbanwaters/urban-waters-small-grants-fact-sheet
GRANTING AGENCY: National Fish and Wildlife Foundation				
Environmental Solutions for Communities Grants	$100,000	• URBAN GREENING + COOLING • USABLE OPEN SPACE	• Conserving critical land and water resources and improving local water quality; facilitating investments in green infrastructure, renewable energy and energy efficiency; and encouraging broad-based citizen and targeted youth participation in project implementation. • Most competitive grants include matching funds and/or partner contributions.	http://www.nfwf.org/environmentalsolutions/Pages/home.aspx
Five Star and Urban Waters Restoration Grant Program	$50,000	• STORMWATER CAPTURE + TREATMENT • COMMUNITY OUTREACH	• Funds projects that work to restore wetland, riparian, in-stream and/or coastal habitat and have measurable ecological, educational and community benefits and meaningful education and training activities, either through community outreach, participation and/or integration with K-12 environmental curriculum. • Minimum 1:1 match, cash or in-kind services.	http://www.nfwf.org/fivestar/Pages/home.aspx
GRANTING AGENCY: United States Forest Service				
National Urban and Community Forestry Advisory Council	Unknown	• URBAN GREENING + COOLING • STORMWATER CAPTURE + TREATMENT	• Funds projects that utilize green infrastructure to manage and mitigate stormwater to improve water quality.	http://www.fs.fed.us/ucf/nucfac.shtml

PROGRAM	AMOUNT	FUNDING POTENTIAL	DESCRIPTION AND REQUIREMENTS	MORE INFORMATION
GRANTING AGENCY: CalTrans				
Sustainable Transportation Planning Grants	Unknown	• SAFE CONNECTIONS • COMMUNITY OUTREACH	• Funds projects that address multi-modal mobility deficiencies, encourages stakeholder collaboration, and integrates "Smart Mobility 2010" concepts • 11.5% local match.	http://www.dot.ca.gov/hq/tpp/grants.html
GRANTING AGENCY: CalTrans and Safe Routes to School National Partnership				
Active Transportation Program Grants	50% of annual $360 million budget available on competitive basis statewide	• MANAGEMENT + MAINTENANCE • SAFE CONNECTIONS	• Funds projects that increase the proportion of trips accomplished by biking and walking, increase safety and mobility for non-motorized users, advance the active transportation efforts of regional agencies to achieve greenhouse gas (GHG) reduction goals, enhance public health, ensure that disadvantaged communities fully share in the benefits of the program, and provide a broad spectrum of projects to benefit many types of active transportation users. • Reimbursement program.	http://www.dot.ca.gov/hq/LocalPrograms/atp/
GRANTING AGENCY: CalFire				
Urban and Community Forestry Program GHG Reduction Fund Grants	$200,000 - $1,500,000	• URBAN GREENING + COOLING • USABLE OPEN SPACE	• Funds from Cap and Trade Revenue. • Several applicable grant categories ("Green Innovations," "Woods in the Neighborhood") • 75/25 state/local match.	http://calfire.ca.gov/resource_mgt/resource_mgt_urbanforestry_grants.php
GRANTING AGENCY: State Water Resources Control Board				
Clean Beaches Initiative Grants	Unknown	• STORMWATER CAPTURE + TREATMENT	• Currently funded through sunsetting Prop. 84. • See below sections on upcoming Prop. 1 Water Bond grant opportunities.	http://www.waterboards.ca.gov/water_issues/programs/grants_loans/
GRANTING AGENCY: National Science Foundation				
Environmental Sustainability Program Grants, PD-14-7643	Unknown	• URBAN GREENING + COOLING	• Promoting sustainable engineered systems that support human well-being and that are also compatible with sustaining natural (environmental) systems. In Green Engineering, research is encouraged to advance the sustainability of manufacturing processes, green buildings, and infrastructure.	http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=501027

CA PROP. 1 WATER QUALITY, SUPPLY, AND INFRASTRUCTURE IMPROVEMENT ACT OF 2014 PROSPECTIVE FUNDING OPPORTUNITIES		
FUNDING POTENTIAL	DESCRIPTION AND REQUIREMENTS	MORE INFORMATION
GRANTING AGENCY: Baldwin Hills Conservancy		
• STORMWATER CAPTURE + TREATMENT	• $10 million available for multi-benefit water quality, water supply, and watershed protection and restoration projects.	http://www.bhc.ca.gov/grant_opportunities.html http://resources.ca.gov/california_water_action_plan/
GRANTING AGENCY: Ocean Protection Council		
• STORMWATER CAPTURE + TREATMENT	• $30 million available for multi-benefit water quality, water supply, and watershed protection and restoration projects.	http://www.opc.ca.gov/category/funding-opportunities/ http://resources.ca.gov/california_water_action_plan/
GRANTING AGENCY: San Gabriel and Lower Los Angeles Rivers and Mountains Conservancy		
• STORMWATER CAPTURE + TREATMENT • COMMUNITY OUTREACH	• **$30 million for** multi-benefit water quality, water supply, and watershed protection and restoration projects. • $100 million (§79735(a)) for projects consistent with the San Gabriel and Los Angeles River Watershed and Open Space Plan. • 25% to benefit disadvantaged communities; up to 10% toward project planning.	http://www.rmc.ca.gov/ http://resources.ca.gov/california_water_action_plan/
GRANTING AGENCY: California State Coastal Conservancy		
• STORMWATER CAPTURE + TREATMENT • MANAGEMENT + MAINTENANCE	• $100.5 million **for** multi-benefit water quality, water supply, and watershed protection and restoration projects. • Developing solicitation and evaluation guidelines to be finalized by mid-2015. • Southern California focus on green infrastructure. • Draft Guidelines presented to board Jan 29 or March 26. Public hearings in March/April. Revised guidelines presented to the board for ratification at the meeting on June 25. The guidelines are subject to approval by Natural Resources Agency.	http://scc.ca.gov/category/grants/ http://resources.ca.gov/california_water_action_plan/

FUNDING POTENTIAL	DESCRIPTION AND REQUIREMENTS	MORE INFORMATION
GRANTING AGENCY: California Natural Resources Agency		
• STORMWATER CAPTURE + TREATMENT • MANAGEMENT + MAINTENANCE • USABLE OPEN SPACE • URBAN GREENING + COOLING • COMMUNITY OUTREACH	• $20 million for multibenefit watershed and urban rivers enhancement projects in urban watersheds that increase regional and local water self-sufficiency and meet other criteria. Projects must meet 2 of the following: 1) promote groundwater recharge and water reuse; 2) reduce energy consumption; 3) use soils, plants, and natural processes to treat runoff; 4) create or restore native habitat; 5) increase regional and local resiliency and adaptability to climate change. • 25% to benefit DACs; up to 10% toward project planning • Guidelines to be drafted Summer 2015, grants to be awarded in 2016 and 2017.	http://resources.ca.gov/bonds_and_grants/ http://resources.ca.gov/california_water_action_plan/
GRANTING AGENCY: Department of Fish and Wildlife		
• STORMWATER CAPTURE + TREATMENT • MANAGEMENT + MAINTENANCE • USABLE OPEN SPACE	• $285 million for watershed restoration projects for water quality, river, and watershed protection and restoration projects of statewide importance outside of the Delta (§ 79737). • "Watershed restoration" includes activities to: improve ecological functions, improve local watershed management; and remove sediment or trash. The priorities of DFW however, are geared more toward habitat and less urban green infrastructure. Priority projects funded through Prop 1 will be restoration-focused. • February draft guidelines, July solicitations/RFPs, December for funding. 10-year spending timeline with $36 million proposed for 2015-16 budget.	http://resources.ca.gov/california_water_action_plan/
GRANTING AGENCY: Department of Water Resources		
• STORMWATER CAPTURE + TREATMENT	• $100 million for projects that develop and implement groundwater plans. • At least 10% for disadvantaged communities.	http://resources.ca.gov/california_water_action_plan/
GRANTING AGENCY: Integrated Regional Water Management Program		
• STORMWATER CAPTURE + TREATMENT	• For multi-benefit stormwater management projects. • $98 million for Los Angeles sub-region.	http://resources.ca.gov/california_water_action_plan/

FUNDING POTENTIAL	DESCRIPTION AND REQUIREMENTS	MORE INFORMATION
	GRANTING AGENCY: California State Water Resources Control Board	
• STORMWATER CAPTURE + TREATMENT • MANAGEMENT + MAINTENANCE • COMMUNITY OUTREACH	• $260 million State Water Pollution Control Revolving Fund Small Community Grant Fund (§ 79723). • Funds will be deposited in the State Water Pollution Control Revolving Fund Small Community Grant Fund for grants for wastewater treatment projects. Projects may identify, plan, design, and implement regional mechanisms to consolidate wastewater systems or provide affordable treatment technologies. • Priority given to projects in DACs and to projects addressing public health hazards. • At least 10 % for projects serving severely DACs; Up to 15% may be used for technical assistance to disadvantaged communities.	http://resources.ca.gov/california_water_action_plan/
• STORMWATER CAPTURE + TREATMENT • MANAGEMENT + MAINTENANCE • COMMUNITY OUTREACH	• $200 million (§ 79740). • Multi-benefit stormwater management projects such as green infrastructure, rainwater, and stormwater capture projects; local and regional surface and underground water storage, including groundwater aquifer cleanup or recharge projects; stormwater resource management. • Development of plans for stormwater projects shall address the entire watershed and incorporate the perspectives of communities adjacent to the affected waterways, especially DACs. May be applicable to scaling up Green Alleys. • 50% match may be waived for projects in disadvantaged communities.	http://resources.ca.gov/california_water_action_plan/
• STORMWATER CAPTURE + TREATMENT • MANAGEMENT + MAINTENANCE • COMMUNITY OUTREACH	• $80 million for treatment and remediation activities that prevent or reduce the contamination of groundwater that serves as a source of drinking water (§ 79772). • At least 10% to disadvantaged communities.	http://resources.ca.gov/california_water_action_plan/
• STORMWATER CAPTURE + TREATMENT • MANAGEMENT + MAINTENANCE • COMMUNITY OUTREACH	• $720 million Groundwater Focus projects to prevent or clean up the contamination of groundwater that serves or has served as a source of drinking water. • At least 10% to disadvantaged communities. • 50% cost share required, may be suspended or reduced for disadvantaged communities, added consideration for those projects that leverage private, federal, or local funding • Eligible projects would need to coincide in aquifer recharge zones that are used for drinking water, requiring a program shift to San Fernando Valley. If South LA's perched aquifer is considered a drinking water source, current projects could work.	http://resources.ca.gov/california_water_action_plan/

FUNDING POTENTIAL	DESCRIPTION AND REQUIREMENTS	MORE INFORMATION
GRANTING AGENCY: California State Water Resources Control Board		
• STORMWATER CAPTURE + TREATMENT • MANAGEMENT + MAINTENANCE • COMMUNITY OUTREACH	• $260 million for public water system infrastructure improvements (79724(a)). • Public water system infrastructure improvements and related actions to meet safe drinking water standards, ensure affordable drinking water- or both. • Up to $25 million for technical assistance to eligible communities. • Up to $2.5 million may be administered by the state board for matching funds for disadvantaged communities, at least 10 % for projects serving severely disadvantaged communities, up to 15% for technical assistance to disadvantaged communities. • Public water systems or public agencies that serve disadvantaged communities are eligible. • 50% local cost share (may be reduced or waived) for projects benefitting disadvantaged communities or economically distressed area.	http://resources.ca.gov/california_water_action_plan/

Alleys have a worse connotation than any other place in our street lexicon... So to reclaim an alley as the most vibrant, happy place in our city would be, technically, one of the greatest achievements in urban design.

Walker, 2012

Stormwater Capture + Treatment					
Grant Program Objectives: 1-Promote public health 2-Promote equity 3-Promote infill development & compact development 4-Revitalize urban & community centers 5-Reduce auto use & fuel consumption 6-Improve infrastructure systems 7-Strengthen economy 8-Improve air & water quality 9-Protect natural resources 10-Promote water conservation 11-Promote energy efficiency 12-Reduce GHG emissions					
Grant Program Objectives	***Indicator***	***Desired Outcome***	***Measurement***	***Notes***	***Sources***
8, 9, 12	Impervious Surface Area	Decrease	**Measure and calculate:** Baseline and subsequent impervious surface area. **Location:** Each BMP site. **Units:** Square feet.	---	Center for Neighborhood Technology (2010)
8, 9, 12	Sedimentation & Pollutant Loads Levels	Decrease	**Measure:** Baseline and subsequent concentrations of dissolved nitrogen and phosphorous, as well as total suspended solids (TSS) with water quality monitors. **Location:** Outlets to Los Angeles River and Compton Creek. **Units:** Typically milligrams/liter.	Water quality improvements associated with green infrastructure are not of sufficient magnitude to be meaningful at the site scale. Therefore, improved water quality is best evaluated in the context of watershed green infrastructure implementation, accompanied by hydrologic modeling, to estimate changes in sedimentation and pollutant loads resulting from a green infrastructure program (Center for Neighborhood Technology 2010).	Center for Neighborhood Technology (2010)
8, 9, 12	Turbidity (Amount of Particulate Matter)	Decrease	**Measure:** Baseline and subsequent turbidity (suspended particulates) **Location:** Outlets to Los Angeles River and Compton Creek. **Units:** Parts per million.	Turbidity can be measured in a laboratory or on-site using a handheld turbidity meter. Turbidity meters should be calibrated using standard samples before measuring the turbidity of a water sample (USGS 2012).	The Trust for Public Land Proposal, Swanson & Baldwin 1965 in USGS (2012)
1, 4, 8, 9, 11, 12	Tree Canopy Coverage	Increase	**Measure:** Baseline and subsequent field counts and canopy area estimates per tree (sq ft). Total sq ft canopy area/total sq ft neighborhood area. **Location:** Each neighborhood. **Units:** (# of trees x area of canopy)/total sq ft neighborhood area = tree canopy coverage/neighborhood.	Trees provide direct shading, mitigating urban heat island effects and reducing the energy required to cool buildings. Collect data through field surveys.	The Trust for Public Land Proposal

Grant Program Objectives	*Indicator*	*Desired Outcome*	*Measurement*	*Notes*	*Sources*
8, 9	Impaired Water Segments	Decrease	**Measure:** Baseline and subsequent counts of impaired waters using the state's 303(d) list every two years on even-numbered years. **Location:** Each neighborhood. **Units:** # of impaired water segments/neighborhood.	The state is required to submit a 303(d) list for EPA approval every two years on even-numbered years. States must evaluate all existing and readily available in developing their 303(d) lists (Environmental Protection Agency 2012c).	The Trust for Public Land Proposal, US EPA (2012c)
7, 8, 9	Stormwater Runoff Volume	Decrease	**Measure and calculate:** Baseline and subsequent runoff volume from multiple storm event, calculating average. **Location:** Each BMP site. **Units:** Acre feet.	---	Ragab et al. (2003)
7, 8, 9	Peak flow	Decrease	**Measure:** Baseline and subsequent flow rate of asphalt run-off and permeable paving underdrain discharge during median peak flows. **Location:** Each BMP site. **Units:** Cubic feet/second.	Decreased peak flows is an indicator of restoration of hydrological function to pre-development conditions. Take measurements with a volumetric flowmeter.	Fassman & Blackbourn (2010), Mueller & Thompson (2009), Collins et al. (2008) in Fassman & Blackbourn (2010)
10	Water Usage	Decrease	**Measure and calculate:** Baseline and subsequent water usage per neighborhood **Location:** Each neighborhood. **Units:** Water usage Gallons/neighborhood	Collect data from water production records and meter and billing records maintained by public water supply utilities.	Dziegielewski & Kiefer (2010)

Urban Greening + Cooling					
Grant Program Objectives: 1-Promote public health 2-Promote equity 3-Promote infill development & compact development 4-Revitalize urban & community centers 5-Reduce auto use & fuel consumption 6-Improve infrastructure systems 7-Strengthen economy 8-Improve air & water quality 9-Protect natural resources 10-Promote water conservation 11-Promote energy efficiency 12-Reduce GHG emissions					
Grant Program Objectives	***Indicator***	***Desired Outcome***	***Measurement***	***Notes***	***Sources***
1, 4, 8, 9, 11, 12	Tree Canopy Coverage	Increase	**Measure:** Baseline and subsequent field counts and canopy area estimates per tree (sq ft). Total sq ft canopy area/total sq ft neighborhood area. **Location:** Each neighborhood. **Units:** (# of trees x area of canopy)/total sq ft neighborhood area = tree canopy coverage/neighborhood.	Trees provide direct shading, mitigating urban heat island effects and reducing the energy required to cool buildings. Collect data through field surveys.	The Trust for Public Land Proposal
1, 8, 12	Ground-Level Ozone	Decrease	**Measure:** Baseline and subsequent Air Quality Index (AQI) for South Central Los Angeles. **Location:** South Central Los Angeles **Units:** AQI value ranging from 0-500.	The higher the AQI value, the greater the level of air pollution. An AQI value of 0-50 represents satisfactory air quality, 51-100 represents acceptable air quality, 101-150 represents unhealthy air quality for sensitive groups, 151-200 represents unhealthy air quality, 201-300 represents very unhealthy air quality, and 301-500 represents hazardous air quality (AirNow 2011). Collect data from AirNow, www.airnow.gov.	The Trust for Public Land Proposal, US EPA (2012d)
8, 11, 12	Residential Energy Consumption (Cooling Energy Savings)	Decrease	**Measure and calculate:** Baseline and subsequent energy consumption per neighborhood **Location:** Each neighborhood. **Units:** Energy consumption (kWh)/neighborhood.	Collect data from meter and billing records routinely collected and maintained by electric supply utilities.	US EPA Office of Atmospheric Protection Climate Protection Partnership Division (2008)

Grant Program Objectives	*Indicator*	*Desired Outcome*	*Measurement*	*Notes*	*Sources*
8, 11	Temperature and Relative Humidity	Decrease	Measure: Baseline and subsequent field measurements of temperature and relative humidity at two to three times during the day. Location: Each neighborhood. Units: Degrees Fahrenheit (temperature) and percent (humidity).	A temperature and relative humidity probe (such as Humirel HTM2500) can be used to take the field measurements.	Oka 2011, Nikolopoulou et al. (2011)
1, 5, 11	Positive Perception of Microclimate	Increase	**Measure and analyze**: Baseline and subsequent positive perceptions of microclimate. **Location:** Each BMP site. **Units:** # of positive responses/total responses.	This measure reveals qualitative results. Use questionnaire-guided interviews of pedestrians and bicyclists to collect data.	Nikolopoulou et al. (2011)
8, 11	High Albedo Surface Area	Increase	**Measure and calculate:** Baseline and subsequent high albedo surface area. **Location:** Each BMP site. **Units:** Square feet and percentage of reflected incident flux.	Albedo percentage can be measured with an albedometer or double pyranometer.	Center for Neighborhood Technology (2010)
8, 11	Solar Reflectance Index (SRI)	Decrease	**Measure and calculate:** Baseline and subsequent SRI by measuring solar reflectance using pyranometer in field and thermal emittance using portable, inspection-meter instrument. **Location:** Each BMP site. **Units:** SRI value ranging from 0-100.	SRI is an index that takes into account both solar reflectance and thermal emittance in order to measure how hot a surface would get in the sun. The higher the SRI value, the cooler the surface. The SRI value ranges between 0 (as hot as a black surface) and 100 (as cool as a white surface) (US EPA Office of Atmospheric Climate Protection Partnership Division 2008).	US EPA Office of Atmospheric Protection Climate Protection Partnership Division (2008)

Usable Open Space					
Grant Program Objectives: 1-Promote public health 2-Promote equity 3-Promote infill development & compact development 4-Revitalize urban & community centers 5-Reduce auto use & fuel consumption 6-Improve infrastructure systems 7-Strengthen economy 8-Improve air & water quality 9-Protect natural resources 10-Promote water conservation 11-Promote energy efficiency 12-Reduce GHG emissions					
Grant Program Objectives	***Indicator***	***Desired Outcome***	***Measurement***	***Notes***	***Sources***
1, 5, 12	Residents' perception of and satisfaction with ease of access	Increase	**Measure and analyze:** Baseline and subsequent perception of satisfaction with ease of access **Location:** Each BMP site. **Units:** # of positive responses/total responses.	This measure reveals qualitative results. Use questionnaire-guided interviews of residents to collect data.	Lotfi & Koohsari (2009)
1, 8, 9	Acres of Habitat	Increase	**Measure and calculate:** Baseline and subsequent acres of habitat. **Location:** Each neighborhood. **Units:** Acres of habitat/neighborhood	Collect data through field surveys.	The Trust for Public Land Proposal
1, 8, 9	Habitat Duality and Diversity (Quality)	Increase	**Measure and calculate:** Baseline and subsequent field counts of California native plant & tree species, calculating frequency & dominance. **Location:** Each neighborhood. **Units:** # of native plants and trees/neighborhood.	Collect data through field surveys.	Lindsey (2003)
1	Residents with Asthma (%)	Decrease	**Measure and analyze:** Baseline and subsequent estimates of the population with asthma. **Location:** Each Neighborhood. **Units:** % of neighborhood population with asthma.	Use questionnaire-guided interviews of residents to collect data.	The Trust for Public Land Proposal

Grant Program Objectives	*Indicator*	*Desired Outcome*	*Measurement*	*Notes*	*Sources*
1	Residents Overweight/Obese (%)	Decrease	**Measure and analyze**: Baseline and subsequent estimates of the population who are overweight/obese. **Location:** Each Neighborhood. **Units:** % of neighborhood population who are overweight/obese.	Use questionnaire-guided interviews of residents to collect data.	The Trust for Public Land Proposal
1, 2, 6	Acres of Park per 1,000 Residents	Increase	**Measure and calculate**: Baseline and subsequent acres of parks per 1,000 residents. **Location:** Each neighborhood. **Units:** Acres of parks per 1,000 residents.	Acres of park per 1,000 residents is an indicator of park congestion; as acres of park per 1,000 residents increases, park congestion decreases. Use GIS and population figures from most recent US Census results or American Community Survey estimations to measure and calculate.	The Trust for Public Land Proposal, Boone et al. (2009)
1	Recreational Trips or "User Days" Gained	Increase	**Measure and analyze**: Baseline and subsequent recreational trips, or "user days," gained. **Location:** Each Neighborhood. **Units:** # of residential trips, or "user days," gained.	Use questionnaire-guided interviews of residents to collect data.	Center for Neighborhood Technology (2010)
1, 2, 6	Availability of parks in a neighborhood (Container)	Increase	**Measure**: Baseline and subsequent counts of the number of parks and open spaces. **Location:** Each neighborhood. **Units:** # of parks and open spaces.	Collect data through field surveys or maps.	Boone et al. (2009), Lotfi & Koohsari (2009)
1, 2, 5, 6	Availability of parks in a neighborhood (Coverage)	Increase	**Measure**: Baseline and subsequent counts of the number of parks and open spaces within 1/4 mile (400 meters) of neighborhood centers. **Location:** Each neighborhood. **Units:** # of parks and open spaces within 1/4 mile (400 meters) of neighborhood centers.	Use GIS and mapped data to measure.	Lotfi & Koohsari (2009)

Grant Program Objectives	*Indicator*	*Desired Outcome*	*Measurement*	*Notes*	*Sources*
4	Interactions Between Residents	Increase	**Measure and analyze**: Baseline and subsequent interactions between residents. **Location:** Each BMP site. **Units:** # of positive responses/total responses.	Use questionnaire-guided interviews of residents to collect data. In a previous research example (Kim 2007), questions examine four ways in which residents interact with others in their home community: 'neighboring', 'casual social encounters', 'community participation', and 'social support'. This measure reveals qualitative results.	Kim (2007)
4	Community Identity	Increase	**Measure and analyze**: Baseline and subsequent community identity. **Location:** Each BMP site. **Units:** # of positive responses/total responses.	Use questionnaire-guided interviews of residents to collect data. In a previous research example (Kim 2007), questions examine five ways in which community identity is engendered: 'sense of uniqueness', 'continuity', 'significance', 'compatibility', and 'cohesiveness'. This measure reveals qualitative results.	Kim (2007)
4	Community Attachment	Increase	**Measure and analyze**: Baseline and subsequent community attachment. **Location:** Each BMP site. **Units:** # of positive responses/total responses.	Use questionnaire-guided interviews of residents to collect data. In a previous research example (Kim 2007), questions examine four ways in which residents feel at home in their communities: 'community satisfaction', 'sense of connectedness', 'sense of ownership', and 'long-term integration'. This measure reveals qualitative results.	Kim (2007)

Safe Connections					
Grant Program Objectives: 1-Promote public health 2-Promote equity 3-Promote infill development & compact development 4-Revitalize urban & community centers 5-Reduce auto use & fuel consumption 6-Improve infrastructure systems 7-Strengthen economy 8-Improve air & water quality 9-Protect natural resources 10-Promote water conservation 11-Promote energy efficiency 12-Reduce GHG emissions					
Grant Program Objectives	***Indicator***	***Desired Outcome***	***Measurement***	***Notes***	***Sources***
5, 6, 12	Transit Ridership	Increase	**Measure and analyze:** Baseline and subsequent count of transit trips. **Location:** Each neighborhood. **Units:** # transit trips.	Use questionnaire-guided interviews of residents to collect data.	The Trust for Public Land Proposal
5, 12	Average Vehicle Miles Traveled (VMT)	Decrease	**Measure and analyze:** Baseline and subsequent average VMT. **Location:** Each neighborhood. **Units:** Miles.	Use questionnaire-guided interviews of residents to collect data.	The Trust for Public Land Proposal
1, 5, 6, 12	Miles of Bike Lanes	Increase	**Measure:** Baseline and subsequent miles of bike lanes. **Location:** Each neighborhood. **Units:** Miles.	Use field surveys and/or maps to collect data.	The Trust for Public Land Proposal
5, 6, 12	Miles of Green Alleys	Increase	**Measure:** Baseline and subsequent miles of green alleys. **Location:** Each neighborhood. **Units:** Miles.	Use field surveys and/or maps to collect data.	The Trust for Public Land Proposal
1, 2, 5, 6, 12	Number of Walking or Biking Trips	Increase	**Measure and analyze:** Baseline and subsequent count of walking and biking trips. **Location:** Each neighborhood. **Units:** # walking or biking trips per year.	Walking and biking trips is an indicator of pedestrianism. Research has linked increased levels of pedestrianism with increased sense of community and community pride (Lund 2003 in Kim 2007). Use questionnaire-guided interviews of residents to collect data.	The Trust for Public Land Proposal, Lund (2003) in Kim (2007)
7	Property Value	Increase	**Measure:** Baseline and subsequent property values for alley adjacent properties. **Location:** Each BMP site. **Units:** Dollars.	---	Center for Neighborhood Technology (2010)

Grant Program Objectives	*Indicator*	*Desired Outcome*	*Measurement*	*Notes*	*Sources*
5, 6, 12	Transportation Infrastructure Elements	Increase	**Measure:** Baseline and subsequent field counts of number of separated bicycle paths per mile, number of on-street bike lanes per mile, proportion of off-road routes, bike racks or lockers, and presence of streetlights. **Location:** Each neighborhood. **Units:** # of separated bicycle paths per mile, number of on-street bike lanes per mile, proportion of off-road routes, number of bike racks or lockers per mile, and number of streetlights per mile.	Collect data through field surveys	Xing et al. (2010)
1, 5, 12	Percentage of the Population who Walk	Increase	**Measure and analyze:** Baseline and subsequent estimates of the population who walk. **Location:** Each Neighborhood. **Units:** % of neighborhood population who walk.	Use questionnaire-guided interviews of residents to collect data.	Xing et al. (2010)
1, 5, 12	Percentage of the Population who Bike	Increase	**Measure and analyze:** Baseline and subsequent estimates of the population who bike. **Location:** Each Neighborhood. **Units:** % of neighborhood population who bike.	Use questionnaire-guided interviews of residents to collect data.	Xing et al. (2010)
1, 5, 12	Collisions	Decrease	**Measure and calculate:** Baseline and subsequent counts of collisions. **Location:** Each neighborhood. **Units:** Number of collisions	---	Xing et al. (2010)

Grant Program Objectives	*Indicator*	*Desired Outcome*	*Measurement*	*Notes*	*Sources*
1, 5, 12	Temperature and Relative Humidity	Decrease	**Measure:** Baseline and subsequent field measurements of temperature and relative humidity at two to three time during the day. **Location:** Each neighborhood. **Units:** Degrees Fahrenheit (temperature) and percent (humidity).	A decrease in temperature and relative humidity indicates and increase in pedestrian physical comfort. A temperature and relative humidity probe (such as Humirel HTM2500) can be used to take field measurements.	Oka (2011), Nikolopoulou et al. (2011)
1, 5, 8, 11, 12	Solar Reflectance Index (SRI)	Increase	**Measure and calculate:** Baseline and subsequent SRI and thermal emittance. **Location:** Each BMP site. **Units:** SRI value ranging from 0-100.	SRI is an index that takes into account both solar reflectance and thermal emittance in order to measure how hot a surface would get in the sun. The higher the SRI value, the cooler the surface. The SRI value ranges between 0 (as hot as a black surface) and 100 (as cool as a white surface) (US EPA Office of Atmospheric Climate Protection Partnership Division 2008). An increase in SRI indicates an increase in pedestrian physical comfort. Use a pyranometer to take field measurements of solar reflectance and a portable, inspection-meter instrument for thermal emittance.	US EPA Office of Atmospheric Protection Climate Protection Partnership Division (2008), Oka (2011)
1, 5, 12	Amount of Shade	Increase	**Measure:** Baseline and subsequent amounts of shade. **Location:** Each BMP site. **Units:** Percentage of two measurements.	Take measurements with an integrated probe and microcontroller sensor within a 2 meter diameter circle at the BMP site and in full sunlight.	Oka (2011)
3, 4, 6	Access to Transit	Increase	**Measure and calculate:** Baseline and subsequent proportion of jobs and housing units within 1/2 mile of transit. **Location:** Each Neighborhood. **Units:** Proportion of jobs and housing units within 1/2 mile of transit.	---	The Trust for Public Land Proposal

Grant Program Objectives	*Indicator*	*Desired Outcome*	*Measurement*	*Notes*	*Sources*
1	Noise Pollution	Decrease	**Measure and/or analyze:** Baseline and subsequent noise levels. **Location:** Each BMP site. **Units:** Decibels, # of positive responses/total responses.	**Take measurements with an Extech 407740 Type 2 sound level meter (at 1.5 m above ground level) and/or collect data through questionnaire-guided interviews of pedestrians.**	Center for Neighborhood Technology (2010); Nikolopoulou et al. (2011)
4, 7	Crime Rate	Decrease	Measure and calculate: Baseline and subsequent occurrences of property and violent crimes per 1,000 residents. Location: Each neighborhood. Units: # of property crimes per 1,000 residents, # of violent crimes per 1,000 residents.	Collect data from final police reports.	Brown, Perkins & Brown (2004); Cervero & Duncan (2003); Painter & Farrington (2001)
4, 7	Perceived Safety	Increase	**Measure and analyze**: Baseline and subsequent perceived safety. **Location**: Each neighborhood. **Units:** # of positive responses/total responses.	Collect data through questionnaire-guided interviews of residents. This measure reveals qualitative results.	Brown, Perkins & Brown (2004)

PREDICTED PERFORMANCE TABLE

SAMPLE PREDICTED PERFORMANCE TABLE				
FEATURE	**CATEGORY**	**PERFORMANCE METRIC**	**PREDICTED PERFORMANCE**	**SOURCE**
Canopy/Street Trees	Stormwater Capture + Treatment	Rainfall Interception / Runoff Reduction	20 years after planting: Small Tree (14' tall, 15' spread) = 80 gal; Medium Tree (37' tall, 31' spread) = 1,427 gal; Large Tree (51' tall, 36' spread) = 1,641 gal	McPherson et al. (2011)
Canopy/Street Trees	Improved Air Quality	NO2, SO2, O3, PM-10 Uptake and Avoided (lbs.)	# of trees * average annual uptake and avoided pollutant emissions (lbs/tree) = total annual air pollutant reduction (lbs)	Center for Neighborhood Technology (2010)
Canopy/Street Trees	Urban Greening + Cooling	Sunlight Transfer	In summertime, generally 10-30% of the sun's energy reaches the area below a tree, with the remainder being absorbed by leaves and used for photosynthesis, and some being reflected back into the atmosphere. In winter, the range of sunlight transmitted through the tree is much wider-- 10-80%-- because evergreen and deciduous trees have different wintertime foliage, with deciduous trees losing their leaves and allowing more sunlight through.	United States Environmental Protection Agency, Office of Atmospheric Protection, Climate Protection Partnership Division (2008)
Canopy/Street Trees	Urban Greening + Cooling	Cooling Energy Savings	Studies found that placing varying numbers of trees around a house to shade windows resulted in cooling energy savings ranging from between 7 to 47 percent and were greatest when trees were planted to the west and southwest of buildings.	United States Environmental Protection Agency, Office of Atmospheric Protection, Climate Protection Partnership Division (2008)
Cistern/Rain Barrels	Stormwater Capture + Treatment	Water Available for Harvesting (Gallons)	Annual rainfall (inches) * area of surface (SF) * 144 sq inches/SF * 0.00433 gal/cubic inch * 0.85 collection efficiency = water available for harvest (gal).	Center for Neighborhood Technology (2010)
Green Walls	Urban Greening + Cooling	Temperature Reduction (Degrees)	Vines on walls reduce wall temperatures by up to 36 degree F (20 degree C).	United States Environmental Protection Agency, Office of Atmospheric Protection, Climate Protection Partnership Division (2008)
Parklet: Parking Space	Usable Open Space	Open Space Gained (Sq. Ft.)	Approximately 200 sq. ft. per parking space.	City of San Francisco (2010)
Parklet: Pocket Park	Usable Open Space	Recreational Trips ("User Days" Gained)	1 additional vegetated acre provides ~1,340 user days per year; 1 additional vegetated acre provides ~27,650 user days over a 40-year period.	Stratus (2009) in Center for Neighborhood Technology (2010)

FEATURE	CATEGORY	PERFORMANCE METRIC	PREDICTED PERFORMANCE	SOURCE
Paving: High Albedo (Cool Roofs, Cool Pavement)	Urban Greening + Cooling	Temperature Reduction (Degrees)	10 degree Celcius/50 degree Farenheit decrease in temperature for 0.25 increase in albedo.	Akbart, Pomerantz & Taha (2001)
Paving: Permeable Pavement	Stormwater Capture + Treatment	Runoff Reduction (Gallons)	[Annual precipitation (inches) * green infrastructure area (SF) * % retained] * 144 sq inches/SF * 0.00433 gal/cubic inch = total runoff reduction (gal).	Center for Neighborhood Technology (2010)
Paving: Porous concrete	Quality of Life	Noise Reduction (Decibels)	One study found a reduction of noise level up to 10 decibels.	Olek et al. (2003) and Gerharz (1999) in Center for Neighborhood Technology (2010)
Paving: Pervious pavers	Stormwater Capture + Treatment	Runoff Infiltration (cm/hr)	5-10 cm/hr.	Bean et al. (2004)
Paving: Reinforced Grass Grid Pavers	Stormwater Capture + Treatment	Runoff Infiltration (cm/hr)	8-25 cm/hr.	Bean et al. (2004)
Paving: Pervious asphalt/concrete. Recycled Rubber Sidewalk	Stormwater Capture + Treatment	Runoff Infiltration (cm/hr)	1,000-2,000 cm/hr.	Bean et al. (2004)
Vegetated Swale, Flow-through, Planters Infiltration Planters, Rain Garden, Percolation Curb Inlet, Stormwater Curb Extension	Stormwater Capture + Treatment	Runoff Reduction (Gallons) - Simplified Estimate	[Annual precipitation (inches) * (feature area (SF) + drainage area (SF)] * % rainfall captured] * 144 sq inches/SF * 0.00433 gal/cubic inch = total runoff reduction (gal).	Center for Neighborhood Technology (2010)
Vegetated Swale, Flow-through, Planters Infiltration Planters, Rain Garden, Percolation Curb Inlet, Stormwater Curb Extension	Improved Air Quality	NO2, SO2, O3, PM-10 Uptake and Avoided (lbs)	Total area of practice (SF) * average annual uptake/deposition (lbs/SF) = total annual uptake deposition (lbs).	Center for Neighborhood Technology (2010)

FEATURE	CATEGORY	PERFORMANCE METRIC	PREDICTED PERFORMANCE	SOURCE
Vegetated Swale, Flow-through, Planters Infiltration Planters, Rain Garden, Percolation Curb Inlet, Stormwater Curb Extension	Climate Change Mitigation	Carbon Sequestered (lbs.)	Total area of practice (SF) * average annual amt. of carbon sequesterd (lbs C/SF) = annual amount of carbon sequestered (lbs C).	Center for Neighborhood Technology (2010)
Green Roofs	Stormwater Capture + Treatment	Runoff Reduction (Gallons)	[Annual precipitation (inches) * green infrastructure area (SF) * % retained] * 144 sq inches/SF * 0.00433 gal/cubic inch = total runoff reduction (gal).	Center for Neighborhood Technology (2010)
Green Roofs	Urban Greening + Cooling	Heat Transfer, or Flux	One study found the average rate of heat transfer, or flux, through a green roof was more than 40% less than that for an adjacent light-colored roof.	United States Environmental Protection Agency, Office of Atmospheric Protection, Climate Protection Partnership Division (2008)
Green Roofs	Improved Air Quality	Annual Air Pollutant Uptake/Deposition (lbs)	Area of practice (SF) * average annual pollutant uptake/deposition (lbs/SF) = total annual air pollutant uptake/deposition (lbs).	Center for Neighborhood Technology (2010)
Green Roofs	Improved Air Quality	Particulate Matter (PM) Removal (lbs.)	A 1,000-square foot green roof can remove about 40 lbs. of PM from the air per year, while also producing oxygen and removing CO2.	United States Environmental Protection Agency, Office of Atmospheric Protection, Climate Protection Partnership Division (2008)
Green Roofs	Climate Change Mitigation	Carbon Sequestered (lbs.)	Total area of practice (SF) * average annual amt. of carbon sequesterd (lbs C/SF) = annual amount of carbon sequestered (lbs C).	Center for Neighborhood Technology (2010)
Green Roofs	Quality of Life	Sound Transmission Loss (Decibels)	Comparing green roofs to conventional roofs, one study found sound transmission decreased 5-13 decibels in low- and mid-frequency ranges, and 2-8 decibels in the high frequency range.	Connelly & Hodgson (2008) in Center for Neighborhood Technology (2010)

SAMPLE ONLINE MODELING TOOLS LINK: http://water.epa.gov/infrastructure/greeninfrastructure/gi_modelingtools.cfm				
FEATURE(S)	**CATEGORY(IES)**	**Performance Metric (OUTPUT)**	**PREDICTED PERFORMANCE**	**SOURCE**
Canopy/Street Trees	Climate Change Mitigation	Carbon Sequestered (lbs.)	Predicted performance based on inputs at site scale: climate zone, tree species of interest, tree size (d.b.h.) or age.	Tree Carbon Calculator (http://www.fs.fed.us/ccrc/tools/ctcc.shtml)
Canopy/Street Trees	Urban Greening + Cooling	Cooling Energy Savings (kWh), Carbon Dioxide Equivalents of Energy Savings	Predicted performance based on inputs at site scale: climate zone, tree species of interest, tree size (d.b.h.) or age, tree distance from building, tree direction from building, building age, type of air conditioning equipment.	Tree Carbon Calculator (http://www.fs.fed.us/ccrc/tools/ctcc.shtml)
Downspout Disconnection, Permeable Pavement, Grass Channel, Dry Swale, Biorentention, Infiltration, Extended Detention Pond, Sheetflow to Filter, Wet Swale, Constructed Wetland, Wet Pond, Green Roof	Stormwater Capture + Treatment	Runoff Volume Reduction (ft^3 / design storm), Phosphorous Load Reduction (lb/yr), Nitrogen Load Reduction (lb/yr)	Predicted performance based on inputs at site scale: annual precipitation, land cover distribution, soil type distribution, BMPs.	Virginia Runoff Reduction Method (http://www.dcr.virginia.gov/lr2f.shtml)
Planters, Permeable Pavement, Rain Gardens, Retention Ponds, Swales, Cisterns, Bioretention, Extended Detention Basins, Green Roof	Stormwater Capture + Treatment	Whole Life Costs, Present Value Graphics	Predicted performance based on inputs at site-watershed scale: drainage area, BMP characteristics, capital costs, maintenance costs.	Water Environment Research Foundation (WERF) BMP and LID Whole Life Cost Models (http://www.werf.org/bmpcost/i/a/K/Search/ResearchProfile.aspx?ReportId=SW2R08)

FEATURE(S)	CATEGORY(IES)	Performance Metric (OUTPUT)	PREDICTED PERFORMANCE	SOURCE
Bioretention, Vegetated Swales, Permeable Pavement, Rain Barrels, Cisterns, Green Roof	Stormwater Capture + Treatment	Runoff Volume Reduction, CSO Volume, Costs	Predicted performance based on inputs at city scale: event precipitation, impervious area, BMPs, BMP parameters.	EPA's Green Long Term Contral - EZ Template (final_green_ltcpez_instructionswithpoecacomments.pdf)
Extended detention, Bioretention, Wetlands, Swales, Permeable Pavement, Filters	Stormwater Capture + Treatment	Runoff Volume, Pollutant Loads, Costs	Predicted performance based on inputs at site-watershed scale: hourly precipitation record, monthly evaporation rates, land use distribution, BMPs, BMP parameters.	WERF BMP SELECT Model (http://www.werf.org/select/i/c/Tools/SELECT.aspx)
Planter Boxes, Rain Gardens, Cisterns, Native Vegetation, Vegetation Filter Strips, Amended Soil, Swales, Trees, Reduced Street Width, Permeable Pavement, Green Roof	Stormwater Capture + Treatment	Runoff Volume Reduction, Costs, Reduced Air Pollutants, Carbon Dioxide Sequestration, Value of Trees, Groundwater Recharge, Reduced Energy Use, Reduced Treatment Benefits	Predicted performance based on inputs at site scale: annual or event precipitation, land cover distribution, soil type, runoff reduction goal, BMPs, BMP parameters.	Center for Neighborhood Technology Green Values National Stormwater Management Calculator (http://greenvalues.cnt.org/national/calculator.php)

APPENDIX E

POTENTIAL LID BMP LOCATIONS AND CAPTURE AREAS + PRIORITY NETWORK ALLEY DESIGN GUIDES

The maps in this appendix show the recommended locations for consideration of low impact development (LID) stormwater best management practices (BMPs) for the priority networks (excluding Avalon). Examples of BMP types including pictures are shown in Appendix A. Proposed locations for BMPs include curbside parkway planters and vegetated median swales, as well as BMPs constructed in redesigned alleys. The estimated potential catchment area of the proposed BMPs is based upon existing drainage patterns as shown in publicly available records of the City of Los Angeles Department of Public Works Bureau of Engineering.

In addition, following the Potential LID BMP Location maps for each network, individual alley guides for all alleys within the network are presented. Each alley guide includes alley specific design recommendations and considerations which include:

- Visibility within the alley.
- Surface material in the alley and its condition.
- Design theme included in the Network Master Plan in *Chapter 8: Green Alley Network Design*.
- Priority design typology.
- Additional design typology suitabilities.
- How ideal an alley is for infiltration BMPs.
- How ideal an alley is for flow through BMPs.
- The alley catchment area.
- Stormwater calculations related to the alley catchment area (from the GIS analysis described in *Chapter 7: Secondary Analysis and Input*).
- Local considerations like community facilities that should be consulted during designs.
- Adjacent opportunities for open space in vacant lots, infiltration in parking lots, and green roofs on large public facilities.
- Designations included in the Draft South Los Angeles and Draft South East Los Angeles Community Plan Implementation Overlay Districts.
- Opportunities for infiltration of sheet flow from adjacent streets and parking lots.

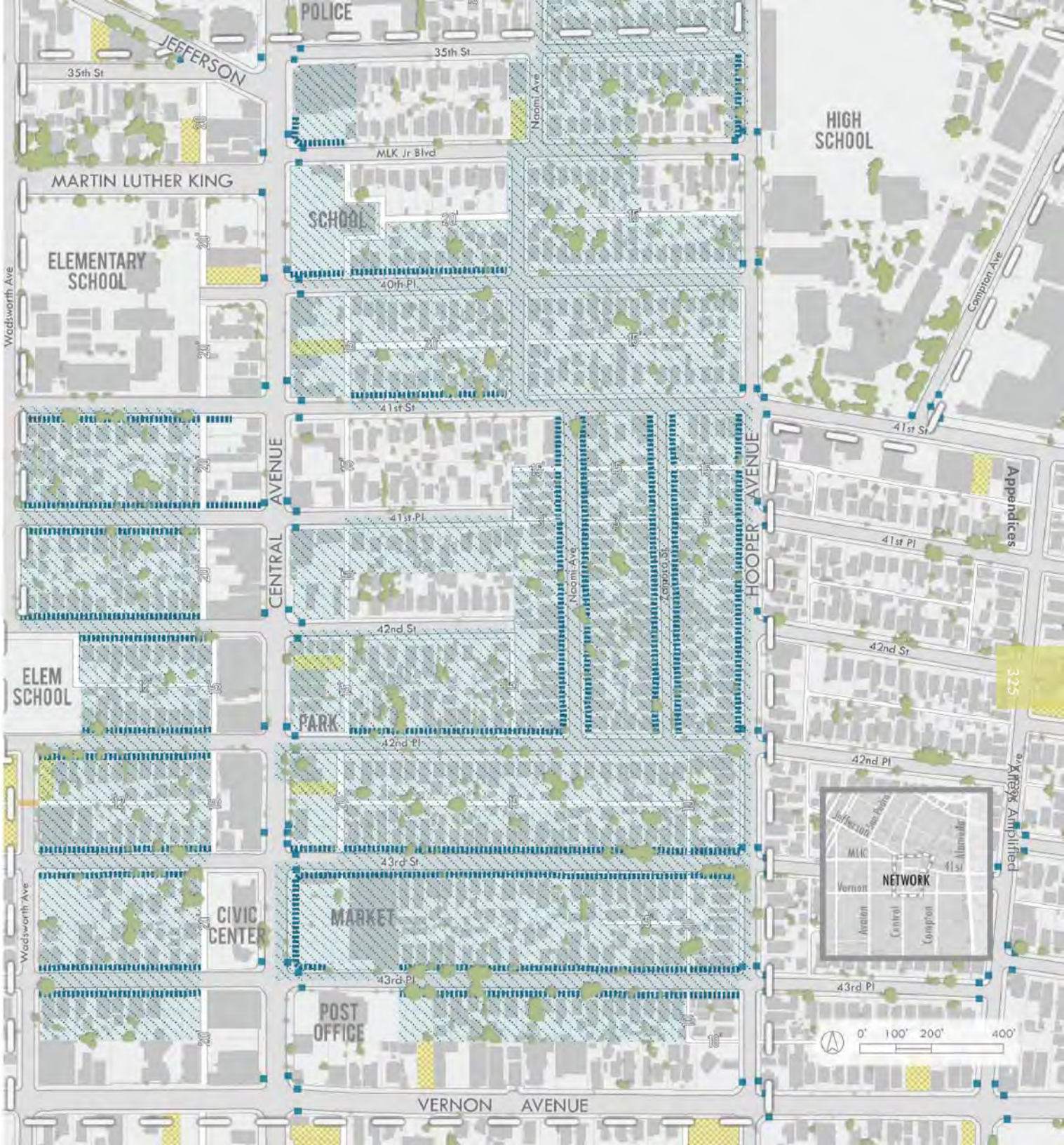
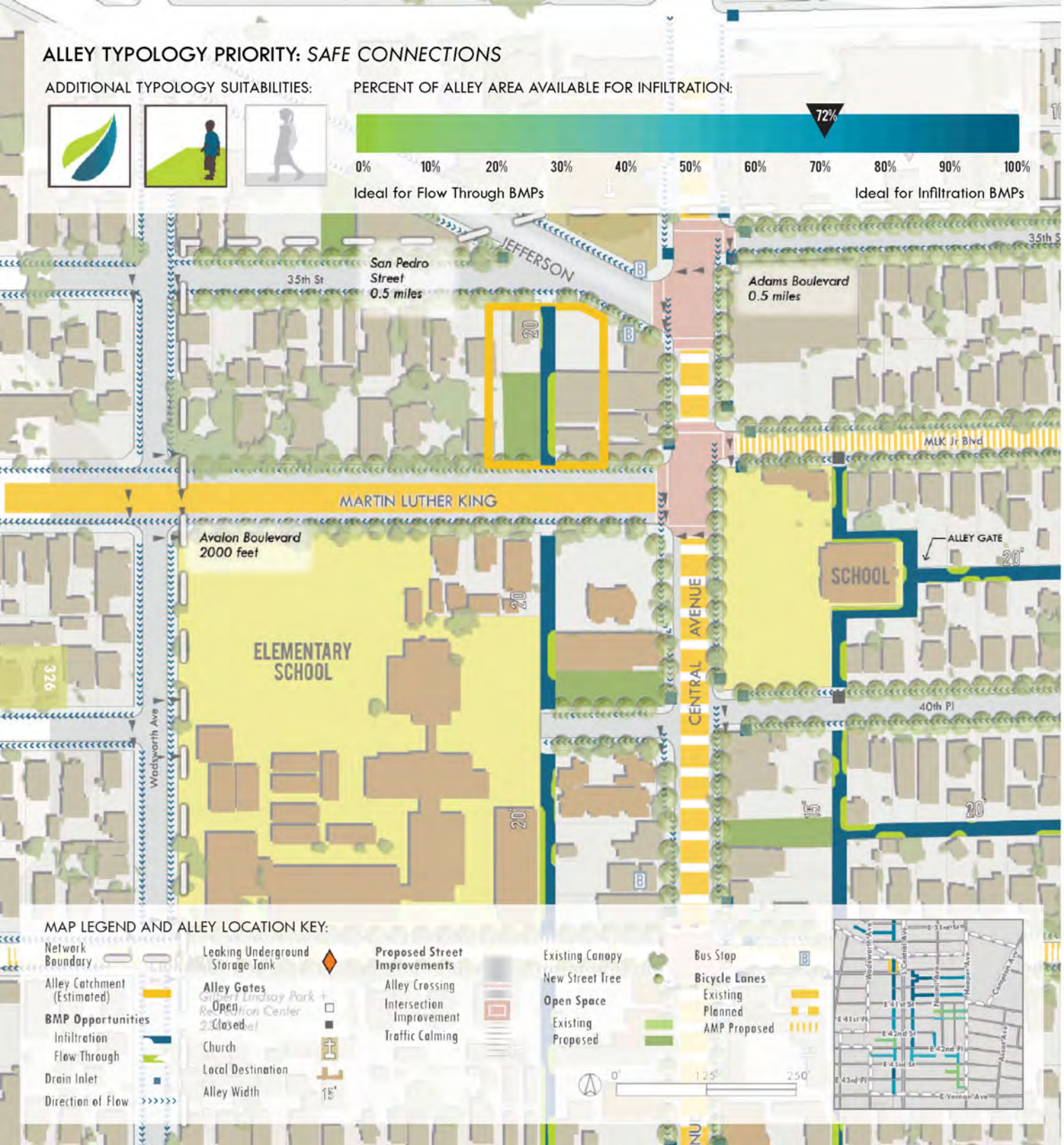


FIGURE E.1
POTENTIAL LID BMP LOCATIONS IN THE CENTRAL-JEFFERSON HIGH NETWORK



CENTRAL-JEFFERSON HIGH NETWORK ALLEY #1

DESIGN CONSIDERATIONS:

- This alley is included as part of the fitness loop design.
- The surface of the alley is asphalt.
- Visibility within the alley is high.
- This alley is suitable to a mix of infiltration and flow through BMPs, the north end of the alley could infiltrate sheet flow from the adjacent street.
- A vacant lot to the west of the alley should be considered for potential new open space and could increase the opportunity to infiltrate larger volumes of stormwater (including sheet flow from the adjacent street).
- CPIO designated TOD High Density Neighborhood Serving Corridor.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	12270
Commercial property (cuft)	17230
Industrial property (cuft)	0
Total runoff (cuft)	29500

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	18788
Pervious runoff (cuft)	702

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	4400
Building Setback (sqft)	1234
Estimated Catchment (sqft)	34753

FIGURE E.2
DETAILED MAP FOR CENTRAL-JEFFERSON HIGH NETWORK ALLEY #1

CENTRAL-JEFFERSON HIGH NETWORK ALLEY #2

DESIGN CONSIDERATIONS:

- This alley is included as part of the fitness loop design.
- The surface of the alley is asphalt.
- Visibility within the alley is high.
- This alley is suitable to a mix of infiltration and flow through BMPs, both the north and south ends of the alley could serve to infiltrate sheet flow from the alley adjacent streets.
- Design efforts should work with the adjacent elementary school and alley renovations could be included as part of a larger campus greening project.
- CPIO designated TOD Low Density.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	0
Commercial property (cuft)	80590
Industrial property (cuft)	0
Total runoff (cuft)	80590

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	52355
Pervious runoff (cuft)	1066

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	9813
Building Setback (sqft)	1978
Estimated Catchment (sqft)	83653



FIGURE E.3
DETAILED MAP FOR CENTRAL-JEFFERSON HIGH NETWORK ALLEY #2



CENTRAL-JEFFERSON HIGH NETWORK ALLEY #3

DESIGN CONSIDERATIONS:

- This alley is a candidate for open space and/or potential decommissioning. It will be necessary to work with residents to address potential gate removal at the north, south and west ends.
- This alley is suitable for infiltration BMPs with the potential to infiltrate sheet flow from all adjacent streets.
- The surface of the alley is concrete.
- Visibility is moderate in majority of the alley, yet at the north, south, and east sides, visibility is moderately low.
- Design efforts should work with the adjacent school potentially as part of a larger campus greening project.
- CPIO designated TOD Low Density excepting the east-west portion.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	49960
Commercial property (cuft)	36440
Industrial property (cuft)	0
Total runoff (cuft)	86400

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	54825
Pervious runoff (cuft)	2730

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	15772
Building Setback (sqft)	3152
Estimated Catchment (sqft)	109160

FIGURE E.4
DETAILED MAP FOR CENTRAL-JEFFERSON HIGH NETWORK ALLEY #3

CENTRAL-JEFFERSON HIGH NETWORK ALLEY #4

DESIGN CONSIDERATIONS:

- This alley should prioritize pedestrian improvements with safety considerations in mind.
- This alley is suitable for a mix of infiltration and flow through BMPs, with good infiltration potential in the middle of the alley.
- The surface of alley is asphalt.
- Visibility within the alley is moderate to high.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	63660
Commercial property (cuft)	0
Industrial property (cuft)	0
Total runoff (cuft)	63660

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	39315
Pervious runoff (cuft)	3304

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	8856
Building Setback (sqft)	2991
Estimated Catchment (sqft)	94457

FIGURE E.5
DETAILED MAP FOR CENTRAL-JEFFERSON HIGH NETWORK ALLEY #4





CENTRAL-JEFFERSON HIGH NETWORK ALLEY #5

DESIGN CONSIDERATIONS:

- The north-south segment is included as part of the art walk design while the east-west segment should prioritize pedestrian improvements.
- The surface of the alley is asphalt.
- Visibility is high in the north-south segment and moderate in the east-west segment.
- Has a high potential for infiltration BMPs. North and south ends could serve to infiltrate sheet flow from adjacent streets. The adjacent vacant lot could become new plaza/event space and increase infiltration opportunities.
- The north-south portion is CPIO designated TOD Low Density.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	54420
Commercial property (cuft)	23150
Industrial property (cuft)	0
Total runoff (cuft)	77570

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	48839
Pervious runoff (cuft)	2912

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	14243
Building Setback (sqft)	2991
Estimated Catchment (sqft)	103008

FIGURE E.6
DETAILED MAP FOR CENTRAL-JEFFERSON HIGH NETWORK ALLEY #5

CENTRAL-JEFFERSON HIGH NETWORK ALLEY #6

DESIGN CONSIDERATIONS:

- This alley should prioritize pedestrian improvements.
- The surface of the alley is asphalt.
- Visibility within the alley is moderate to high.
- This alley is suitable for a mix of infiltration and flow through BMPs. The east end of the alley could potentially infiltrate sheet flow from the adjacent street.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	63860
Commercial property (cuft)	0
Industrial property (cuft)	0
Total runoff (cuft)	63860

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	39440
Pervious runoff (cuft)	3315

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	8884
Building Setback (sqft)	3258
Estimated Catchment (sqft)	94759

FIGURE E.7
DETAILED MAP FOR CENTRAL-JEFFERSON HIGH NETWORK ALLEY #6





CENTRAL-JEFFERSON HIGH NETWORK ALLEY #7

DESIGN CONSIDERATIONS:

- This alley is included in the fitness loop design.
- The surface of the alley is asphalt.
- Visibility within the alley is high.
- This alley is suitable for a mix of infiltration and flow through BMPs. In addition, the north end of the alley is suitable for infiltration of sheet flow from the adjacent street.
- CPIO designated TOD Low Density.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	14900
Commercial property (cuft)	18600
Industrial property (cuft)	0
Total runoff (cuft)	33500

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	21436
Pervious runoff (cuft)	843

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	4997
Building Setback (sqft)	1896
Estimated Catchment (sqft)	39987

FIGURE E.8
DETAILED MAP FOR CENTRAL-JEFFERSON HIGH NETWORK ALLEY #7

CENTRAL-JEFFERSON HIGH NETWORK ALLEY #8

DESIGN CONSIDERATIONS:

- This alley is included in the art walk design.
- The surface of alley is concrete.
- Visibility within the alley is high.
- This alley is suitable for a mix of infiltration and flow through BMPs. In addition, the north end of the alley is potentially suitable for the infiltration of sheet flow from the adjacent street.
- CPIO designated TOD Low Density.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	12440
Commercial property (cuft)	21920
Industrial property (cuft)	0
Total runoff (cuft)	34360

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	22103
Pervious runoff (cuft)	728

Soils Information:

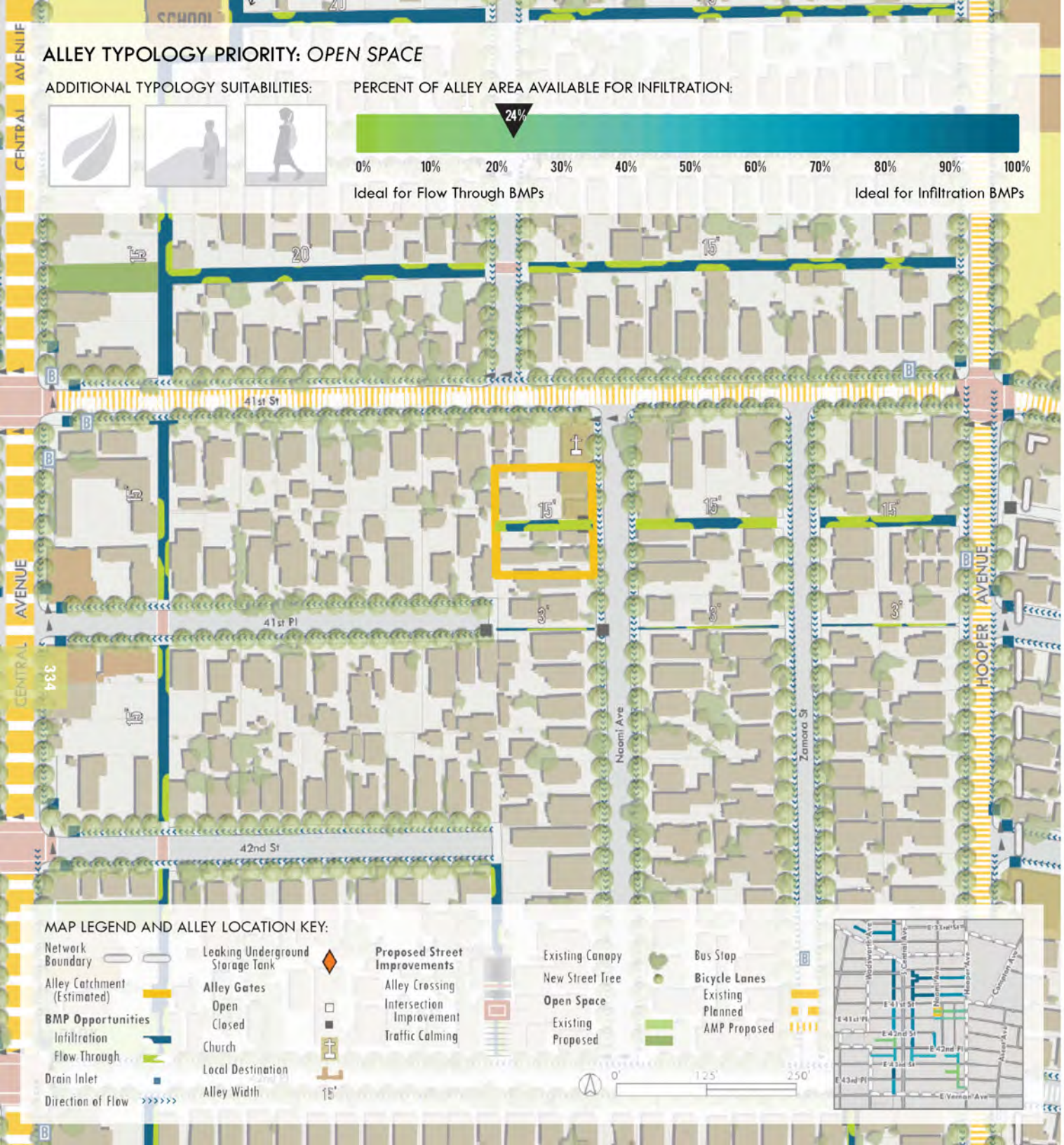
Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	3855
Building Setback (sqft)	1270
Estimated Catchment (sqft)	39535



FIGURE E.9
DETAILED MAP FOR CENTRAL-JEFFERSON HIGH NETWORK ALLEY #8



CENTRAL-JEFFERSON HIGH NETWORK ALLEY #9

DESIGN CONSIDERATIONS:

- This alley is a candidate for open space and/or potential decommissioning.
- The surface of the alley is asphalt.
- Visibility is low for the majority of the alley and high for approximately 10% located at the far east end.
- Redesign efforts should partner with the neighboring church.
- This alley is suitable for flow through BMPs.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	27590
Commercial property (cuft)	0
Industrial property (cuft)	0
Total runoff (cuft)	27590

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	17042
Pervious runoff (cuft)	1432

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	2026
Building Setback (sqft)	1535
Estimated Catchment (sqft)	20045

FIGURE E.10
DETAILED MAP FOR CENTRAL-JEFFERSON HIGH NETWORK ALLEY #9

CENTRAL-JEFFERSON HIGH NETWORK ALLEY #10

DESIGN CONSIDERATIONS:

- This alley is a candidate for open space or potential decommissioning.
- The surface of the alley is asphalt.
- Visibility within the alley is high.
- This alley is suitable for a mix of BMPs though infiltration opportunities are limited to the middle of the alley.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	40930
Commercial property (cuft)	0
Industrial property (cuft)	0
Total runoff (cuft)	40930

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	25277
Pervious runoff (cuft)	2125

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	2922
Building Setback (sqft)	1868
Estimated Catchment (sqft)	30054

FIGURE E.11
DETAILED MAP FOR CENTRAL-JEFFERSON HIGH NETWORK ALLEY #10





CENTRAL-JEFFERSON HIGH NETWORK ALLEY #11

DESIGN CONSIDERATIONS:

- This alley is a candidate for open space and/or potential decommissioning.
- The surface of the alley is asphalt.
- Visibility within the alley is high.
- This alley is suitable for a mix of stormwater BMPs. There is some potential for infiltration of sheet flow from the adjacent street at the east end of the alley.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	39220
Commercial property (cuft)	0
Industrial property (cuft)	0
Total runoff (cuft)	39220

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	24222
Pervious runoff (cuft)	2036

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	2827
Building Setback (sqft)	1671
Estimated Catchment (sqft)	29481

FIGURE E.12
DETAILED MAP FOR CENTRAL-JEFFERSON HIGH NETWORK ALLEY #11

CENTRAL-JEFFERSON HIGH NETWORK ALLEY #12

DESIGN CONSIDERATIONS:

- This alley is part of the fitness loop design.
- The surface of the alley is asphalt.
- Visibility within the alley is high.
- This alley is suitable for a mix of BMPs. There is some potential for infiltration of sheet flow from the adjacent street at the north end of the alley.
- CPIO designated TOD Low Density.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	15350
Commercial property (cuft)	17830
Industrial property (cuft)	0
Total runoff (cuft)	33180

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	21212
Pervious runoff (cuft)	864

Soils Information:

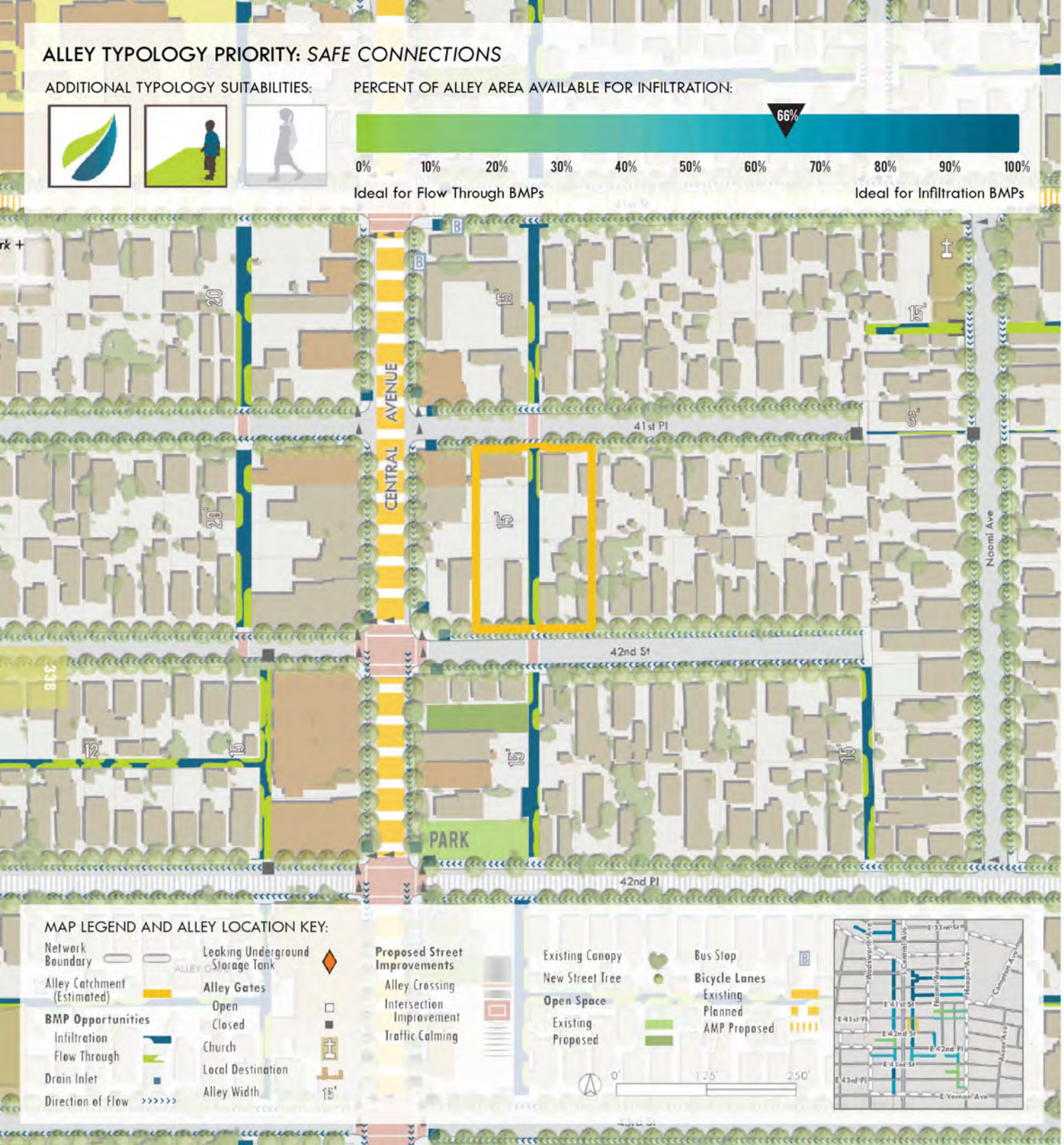
Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	4903
Building Setback (sqft)	1964
Estimated Catchment (sqft)	39924

FIGURE E.13
DETAILED MAP FOR CENTRAL-JEFFERSON HIGH NETWORK ALLEY #12





CENTRAL-JEFFERSON HIGH NETWORK ALLEY #13

DESIGN CONSIDERATIONS:

- This alley is included in the art walk design.
- The surface of the alley is asphalt.
- Visibility within the alley is high.
- This alley is suitable for a mix of stormwater BMPs though infiltration opportunities are limited to the middle of the alley.
- CPIO designated TOD Low Density.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	12090
Commercial property (cuft)	22960
Industrial property (cuft)	0
Total runoff (cuft)	35050

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	22570
Pervious runoff (cuft)	714

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	3661
Building Setback (sqft)	1245
Estimated Catchment (sqft)	40015

FIGURE E.14
DETAILED MAP FOR CENTRAL-JEFFERSON HIGH NETWORK ALLEY #13

CENTRAL-JEFFERSON HIGH NETWORK ALLEY #14

DESIGN CONSIDERATIONS:

- This alley should focus on pedestrian improvements though it will be necessary to work with residents to determine potential gate removal.
- Given the width of the alley, there is limited potential for stormwater BMPs though the west end of the alley could potentially small scale infiltration BMPs.
- The surface of the alley is concrete.
- Visibility within the alley is high.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	27590
Commercial property (cuft)	0
Industrial property (cuft)	0
Total runoff (cuft)	27590

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	17042
Pervious runoff (cuft)	1432

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	460
Building Setback (sqft)	241
Estimated Catchment (sqft)	20900

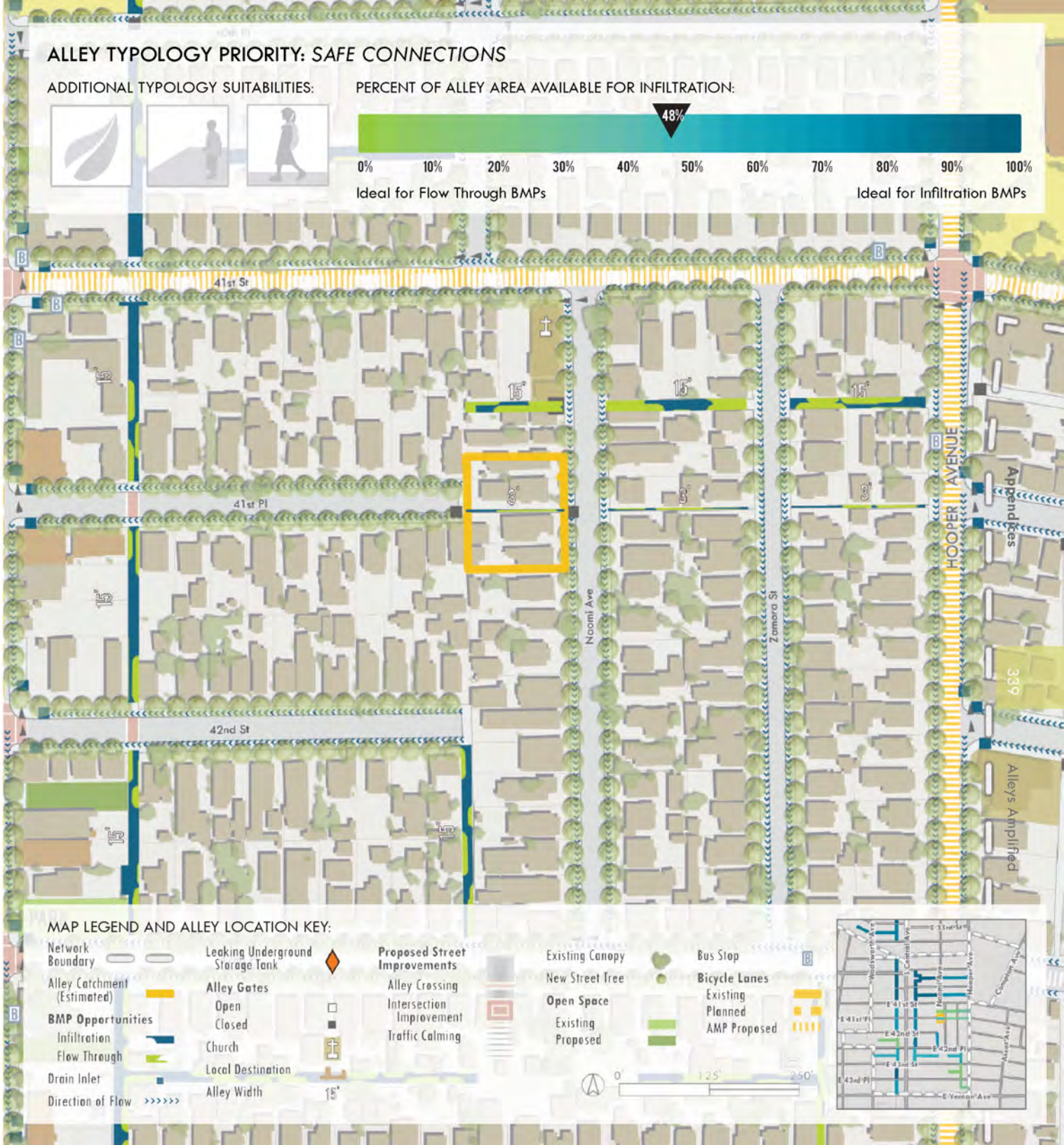
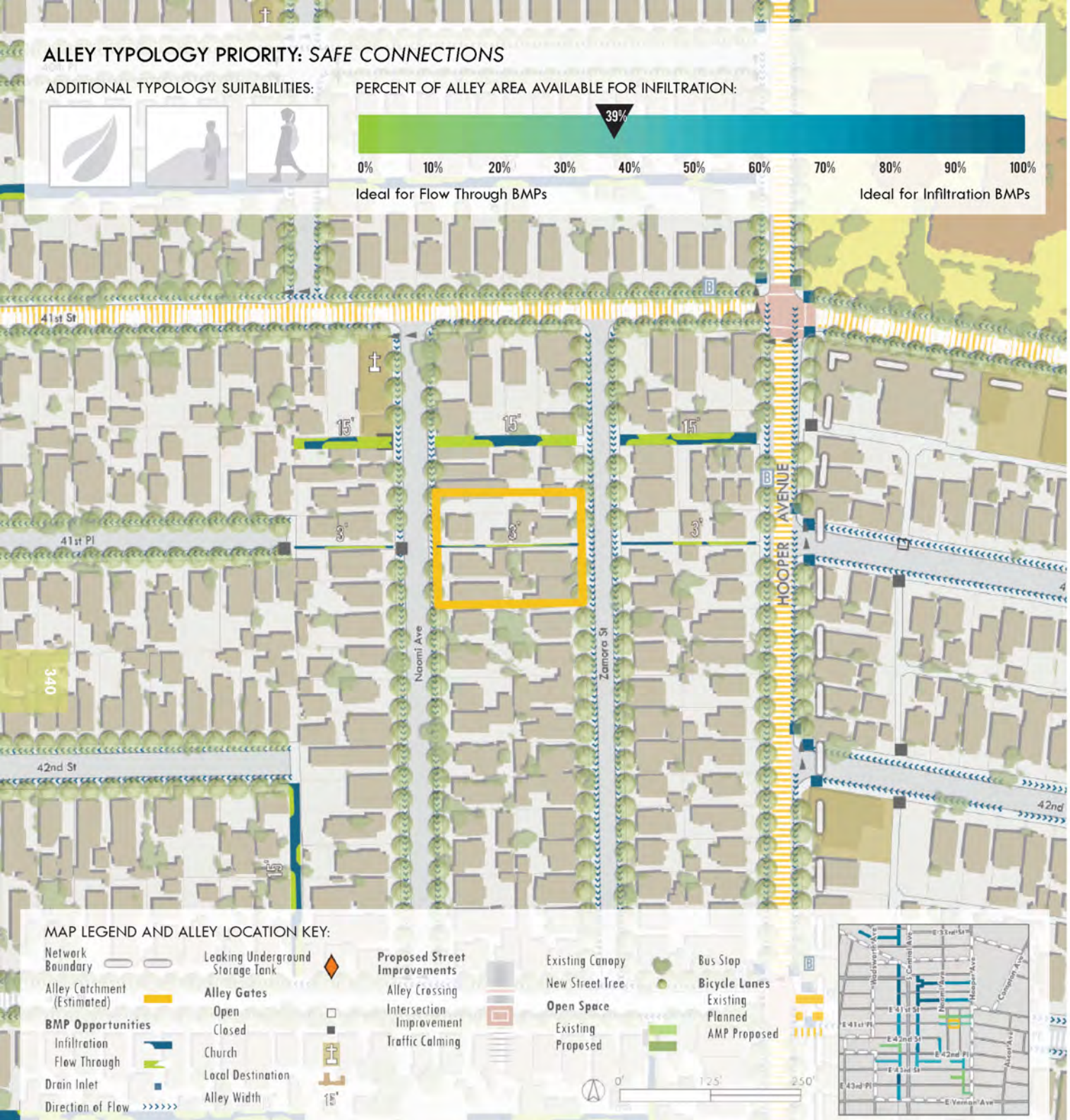


FIGURE E.15
DETAILED MAP FOR CENTRAL-JEFFERSON HIGH NETWORK ALLEY #14



CENTRAL-JEFFERSON HIGH NETWORK ALLEY #15

DESIGN CONSIDERATIONS:

- This alley should focus on pedestrian improvements.
- Given the width of the alley, there is limited potential for stormwater BMPs and this alley is more suitable to flow through BMPs.
- Visibility within the alley is high.
- The surface of the alley is concrete.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	40930
Commercial property (cuft)	0
Industrial property (cuft)	0
Total runoff (cuft)	40930

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	25277
Pervious runoff (cuft)	2125

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	587
Building Setback (sqft)	358
Estimated Catchment (sqft)	30677

FIGURE E.16
DETAILED MAP FOR CENTRAL-JEFFERSON HIGH NETWORK ALLEY #15

CENTRAL-JEFFERSON HIGH NETWORK ALLEY #16

DESIGN CONSIDERATIONS:

- This alley should focus on pedestrian improvements.
- Given the width of the alley, there is limited potential for stormwater BMPs though the west end of the alley could potentially small scale infiltration BMPs.
- The surface of the alley is concrete.
- Visibility within the alley is high.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	39220
Commercial property (cuft)	0
Industrial property (cuft)	0
Total runoff (cuft)	39220

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	24222
Pervious runoff (cuft)	2036

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	645
Building Setback (sqft)	373
Estimated Catchment (sqft)	28716

FIGURE E.17
DETAILED MAP FOR CENTRAL-JEFFERSON HIGH NETWORK ALLEY #16





CENTRAL-JEFFERSON HIGH NETWORK ALLEY #17

DESIGN CONSIDERATIONS:

- The north-south segment is included in the fitness loop design while the east-west segment should prioritize open space and/or be decommissioned.
- Redesign efforts will need to work with local residents to address gate removal. The adjacent school should be involved and renovations could be part of a larger school yard greening.
- The north-south running segment has asphalt paving and the east-west running segment is overgrown.
- This alley has moderate visibility.
- The eastern north-south running portion is CPIO designated TOD Low Density.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	48410
Commercial property (cuft)	22520
Industrial property (cuft)	6390
Total runoff (cuft)	77320

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	46450
Pervious runoff (cuft)	5324

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	8635
Building Setback (sqft)	5838
Estimated Catchment (sqft)	109899

FIGURE E.18
DETAILED MAP FOR CENTRAL-JEFFERSON HIGH NETWORK ALLEY #17

CENTRAL-JEFFERSON HIGH NETWORK ALLEY #18

DESIGN CONSIDERATIONS:

- This alley is part of the art walk design.
- The surface of the alley is asphalt.
- Visibility within the alley is high.
- This alley is suitable for a mix of stormwater BMPs. While there is limited opportunity to infiltrate at the north and south ends of the alleys, a vacant lot to the west could expand infiltration opportunities and become new open space.
- CPIO designated TOD Low Density.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	11930
Commercial property (cuft)	24530
Industrial property (cuft)	0
Total runoff (cuft)	36460

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	23501
Pervious runoff (cuft)	711

Soils Information:

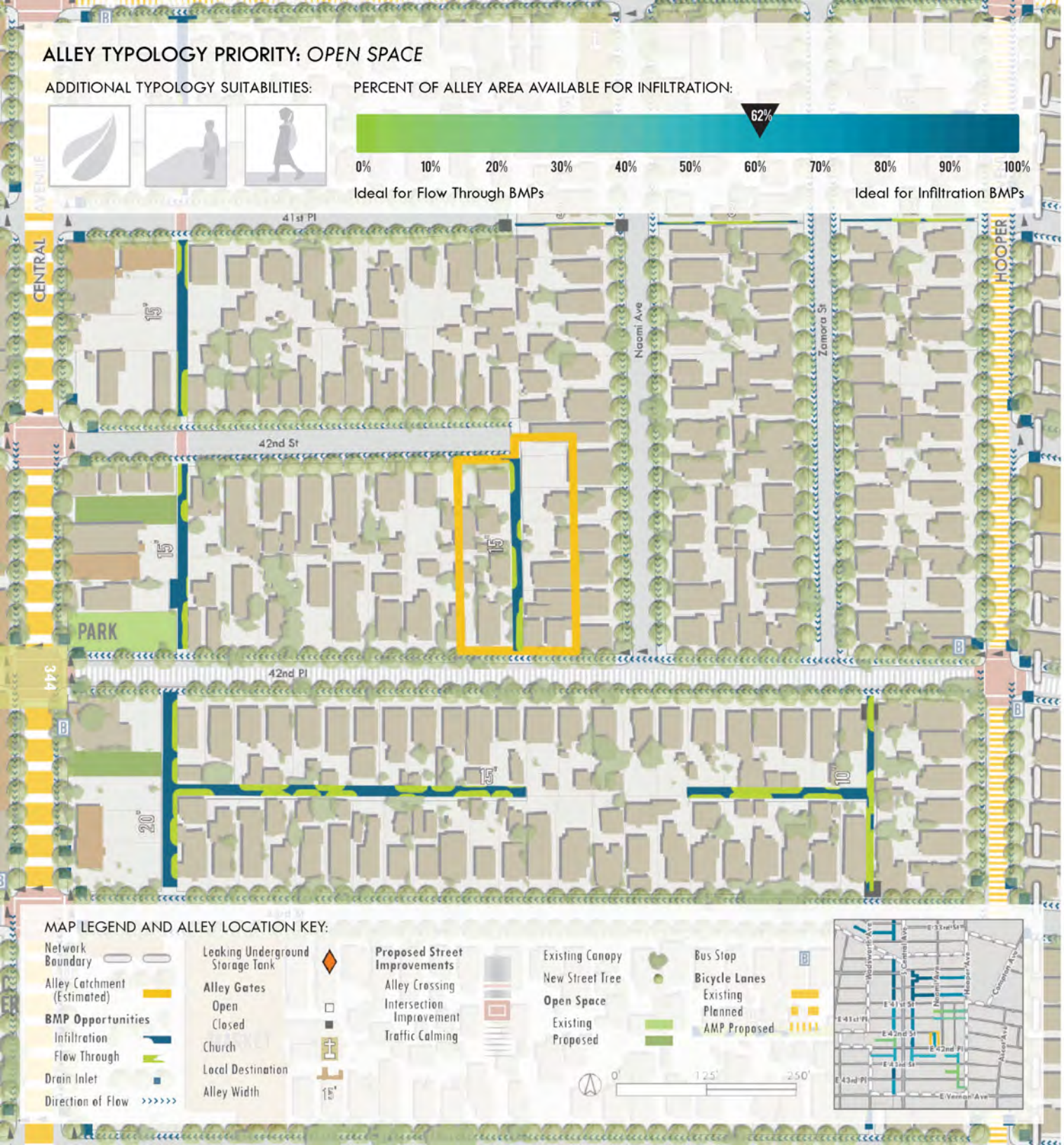
Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	4090
Building Setback (sqft)	1200
Estimated Catchment (sqft)	41278



FIGURE E.19
DETAILED MAP FOR CENTRAL-JEFFERSON HIGH NETWORK ALLEY #18



CENTRAL-JEFFERSON HIGH NETWORK ALLEY #19

DESIGN CONSIDERATIONS:

- This alley could become new open space and/or potentially be decommissioned.
- The surface of the alley is asphalt.
- Visibility in the alley is high.
- This alley is suitable for a mix of stormwater BMPs.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	30280
Commercial property (cuft)	0
Industrial property (cuft)	0
Total runoff (cuft)	30280

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	18700
Pervious runoff (cuft)	1572

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	3730
Building Setback (sqft)	1401
Estimated Catchment (sqft)	44928

FIGURE E.20
DETAILED MAP FOR CENTRAL-JEFFERSON HIGH NETWORK ALLEY #19

CENTRAL-JEFFERSON HIGH NETWORK ALLEY #20

DESIGN CONSIDERATIONS:

- Possibly become new open space and/ or potentially be decommissioned. It will be necessary to work with local residents to determine removal of east end gate. Adjacent church should be involved in redesign efforts.
- The surface of the alley is asphalt.
- Visibility in the alley is high in the north-south running segment and moderate in the east-west running segment.
- The alley is suitable to a mix of stormwater BMPs. An adjacent vacant lot at the west end could increase the potential for stormwater infiltration.
- The north-south portion is CPIO designated TOD Low Density.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	58940
Commercial property (cuft)	21880
Industrial property (cuft)	0
Total runoff (cuft)	80820

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	50792
Pervious runoff (cuft)	3142

Soils Information:

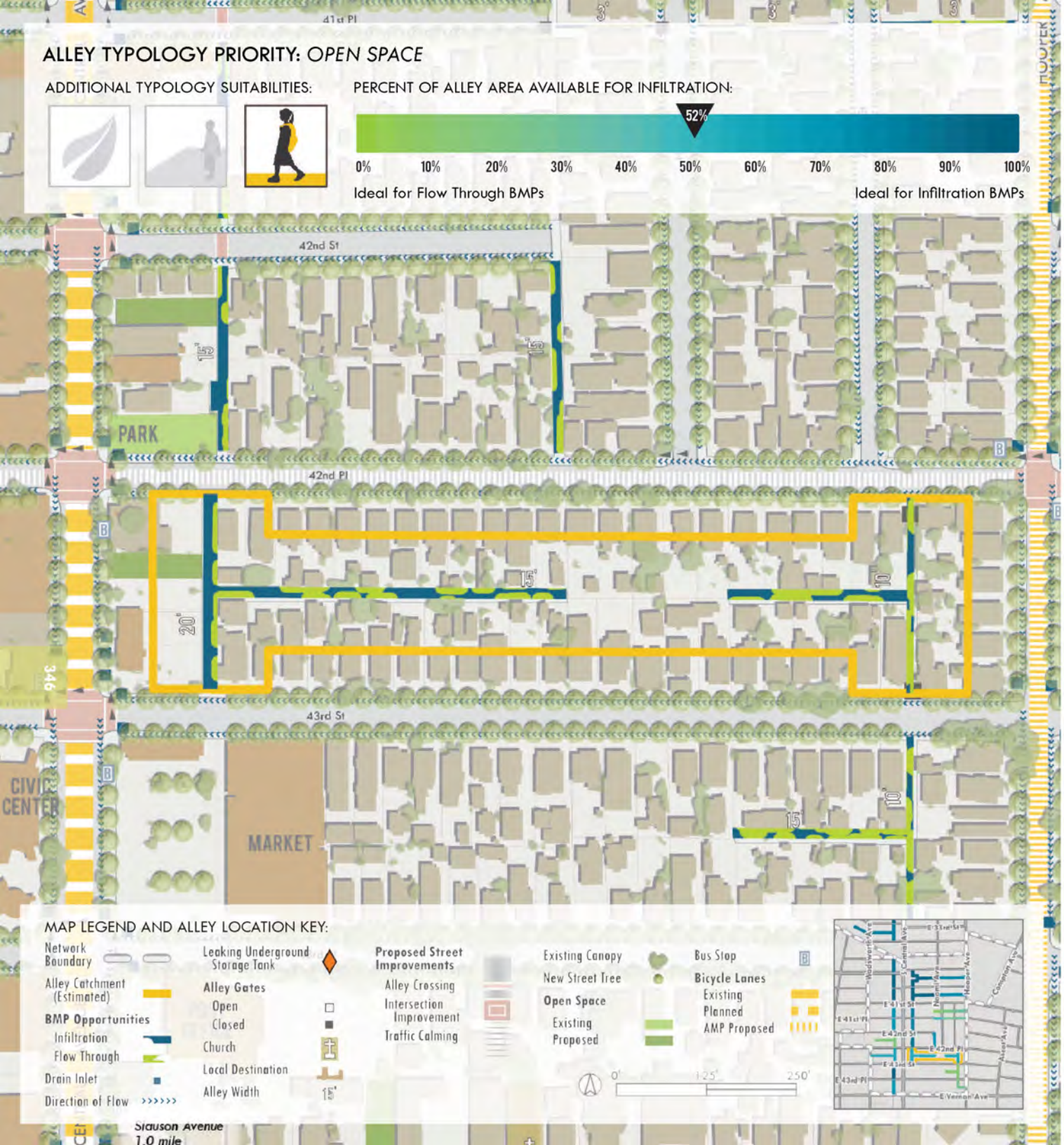
Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	9816
Building Setback (sqft)	4526
Estimated Catchment (sqft)	108486

FIGURE E.21
DETAILED MAP FOR CENTRAL-JEFFERSON HIGH NETWORK ALLEY #20





CENTRAL-JEFFERSON HIGH NETWORK ALLEY #21

DESIGN CONSIDERATIONS:

- The western north-south segment is included in the art walk design while the remaining should prioritize open space or potentially be decommissioned. Alley gates will need to be addressed.
- The western segment has good infiltration potential. A vacant lot to the west could infiltrate stormwater.
- The surface of the alley is asphalt.
- Visibility in the alley is high in the north-south running segments located at the east and west ends and moderate to low in the east-west running segment.
- The western north-south portion is CPIO designated TOD Low Density.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	130100
Commercial property (cuft)	23970
Industrial property (cuft)	0
Total runoff (cuft)	154070

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	96119
Pervious runoff (cuft)	6844

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	19012
Building Setback (sqft)	9144
Estimated Catchment (sqft)	216095

FIGURE E.22
DETAILED MAP FOR CENTRAL-JEFFERSON HIGH NETWORK ALLEY #21

CENTRAL-JEFFERSON HIGH NETWORK ALLEY #22

DESIGN CONSIDERATIONS:

- This alley is part of the fitness loop design.
- The surface of the alley is asphalt.
- Visibility within the alley is high.
- This alley is suitable for infiltration BMPs and could potentially infiltrate sheet flow from adjacent streets to the north and south.
- CPIO designated TOD Low Density.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	14390
Commercial property (cuft)	22760
Industrial property (cuft)	0
Total runoff (cuft)	37150

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	23861
Pervious runoff (cuft)	833

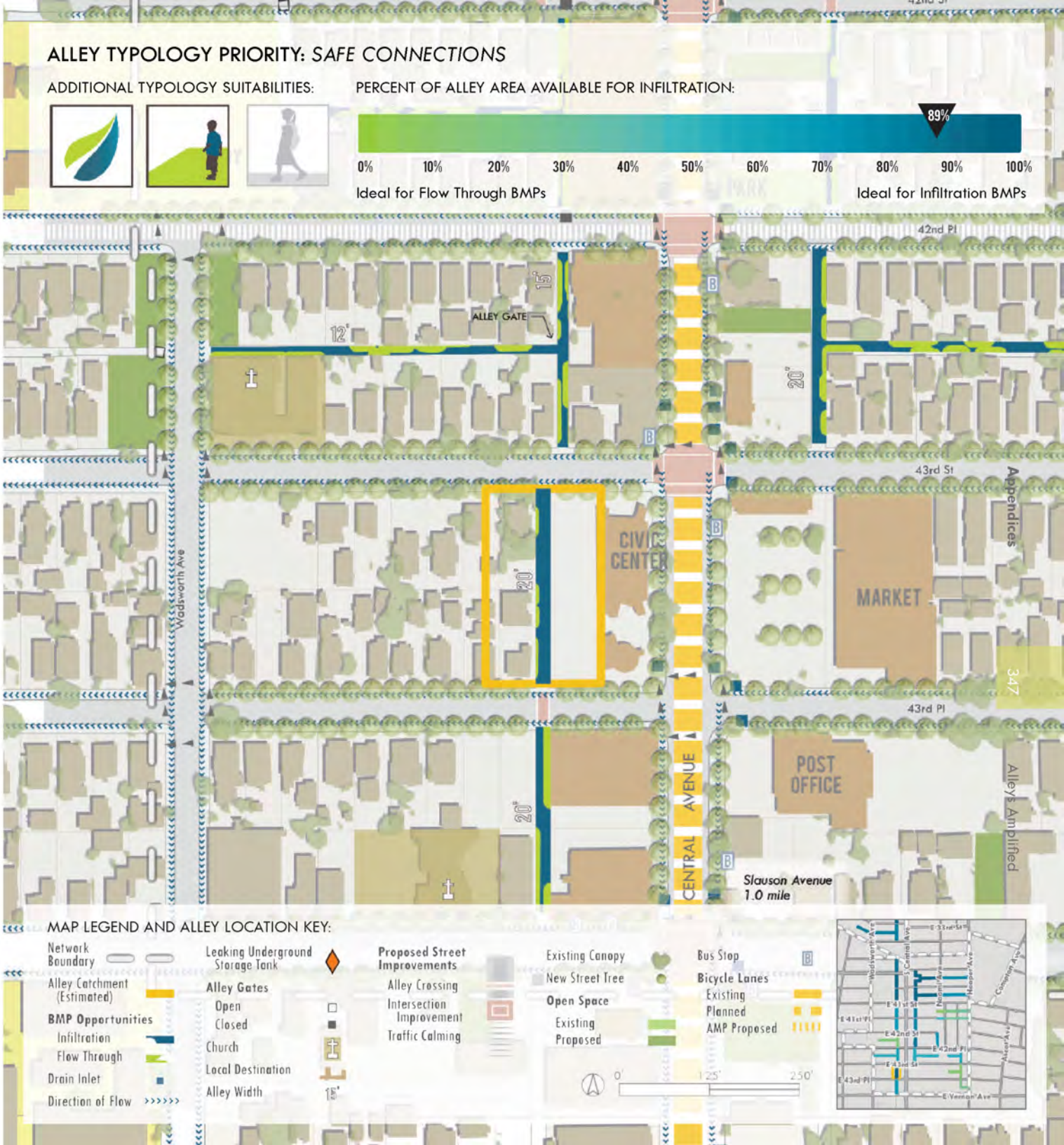
Soils Information:

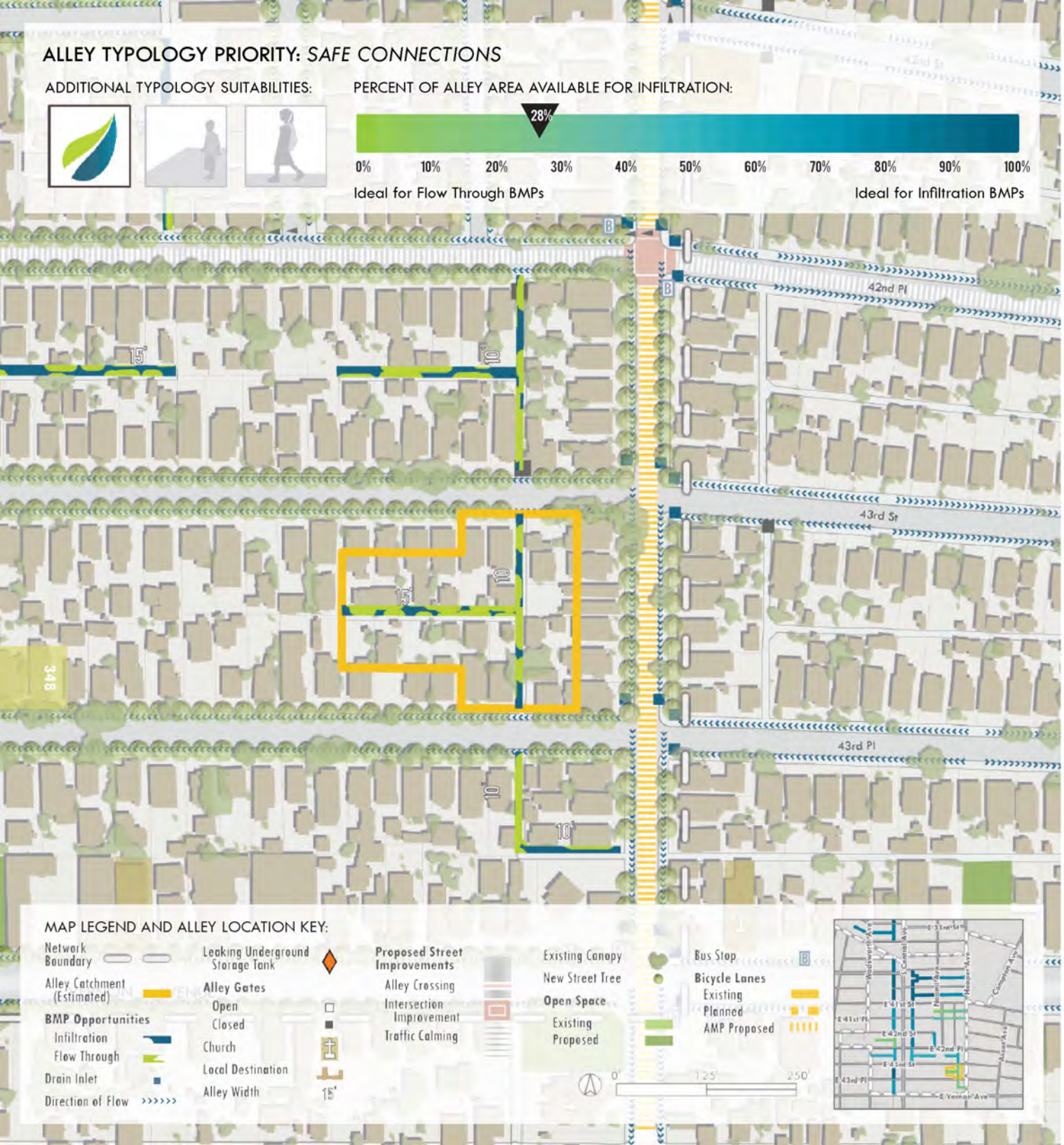
Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	5404
Building Setback (sqft)	603
Estimated Catchment (sqft)	43236

FIGURE E.23
DETAILED MAP FOR CENTRAL-JEFFERSON HIGH NETWORK ALLEY #22





CENTRAL-JEFFERSON HIGH NETWORK ALLEY #23

DESIGN CONSIDERATIONS:

- This alley should prioritize pedestrian improvements with urban cooling features.
- The surface of the alley is asphalt in the north-south running segment and overgrown in the east-west running segment
- Visibility within the alley is high at the north-south running segment and low at the east-west running segment
- This alley is suitable for flow through BMPs.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	46980
Commercial property (cuft)	0
Industrial property (cuft)	0
Total runoff (cuft)	46980

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	29012
Pervious runoff (cuft)	2438

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	6068
Building Setback (sqft)	4359
Estimated Catchment (sqft)	69704

FIGURE E.24
DETAILED MAP FOR CENTRAL-JEFFERSON HIGH NETWORK ALLEY #23

CENTRAL-JEFFERSON HIGH NETWORK ALLEY #24

DESIGN CONSIDERATIONS:

- This alley is part of the fitness loop design.
- This alley is suitable for infiltration BMPs and could potentially infiltrate sheet flow from adjacent streets to the north and south as well as CD 9's field office parking lot.
- The surface of the alley is asphalt.
- Visibility within the alley is high.
- CPIO designated TOD Low Density.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	0
Commercial property (cuft)	43390
Industrial property (cuft)	0
Total runoff (cuft)	43390

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	28541
Pervious runoff (cuft)	163

Soils Information:

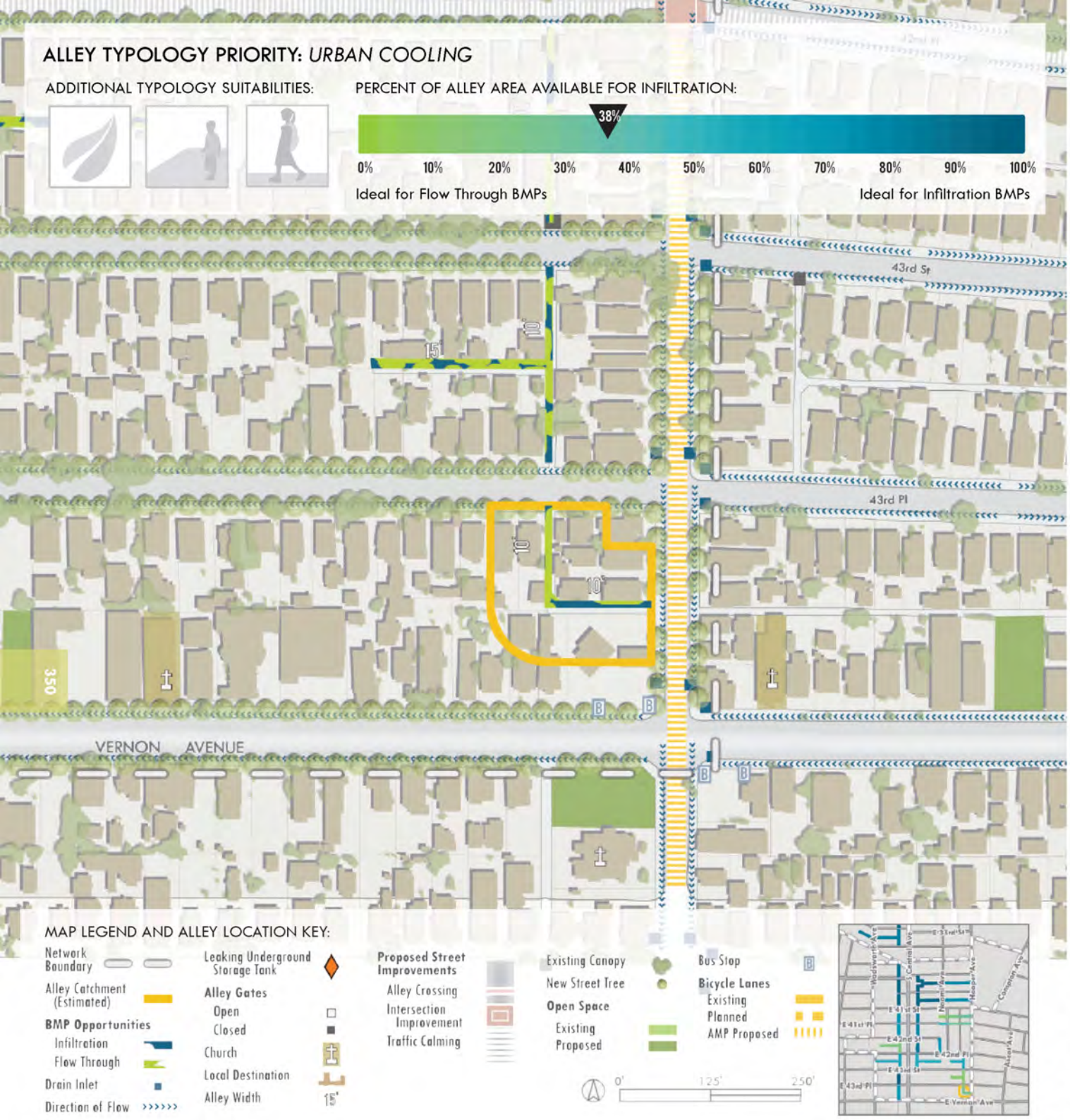
Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	5151
Building Setback (sqft)	2194
Estimated Catchment (sqft)	41711



FIGURE E.25
DETAILED MAP FOR CENTRAL-JEFFERSON HIGH NETWORK ALLEY #24



CENTRAL-JEFFERSON HIGH NETWORK ALLEY #25

DESIGN CONSIDERATIONS:

- This alley should prioritize pedestrian improvements with an urban cooling focus.
- The surface of the alley is asphalt.
- Visibility within the alley is moderate.
- This alley is more suited to flow through BMPs.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	18630
Commercial property (cuft)	0
Industrial property (cuft)	14810
Total runoff (cuft)	33440

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	21124
Pervious runoff (cuft)	1162

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	2821
Building Setback (sqft)	1750
Estimated Catchment (sqft)	42965

FIGURE E.26
DETAILED MAP FOR CENTRAL-JEFFERSON HIGH NETWORK ALLEY #25



Drain Inlet

Location of Proposed Stormwater Best Management Practice (BMP) Design Element

Estimated Potential Stormwater Catchment of Proposed BMP

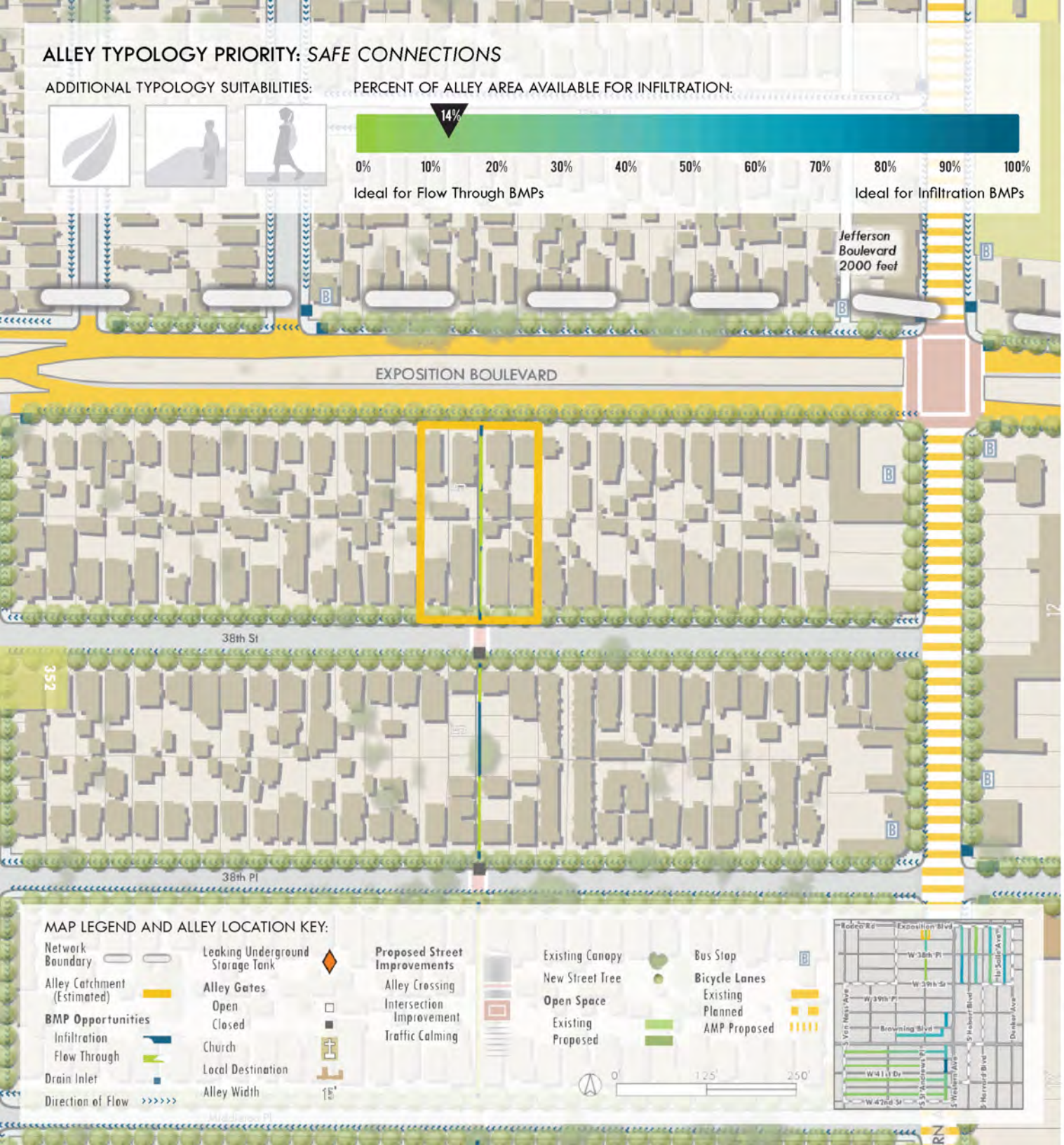
Alley Width 15'

Network Boundary

Existing Tree Canopy

Vacant Lot

FIGURE E.27
POTENTIAL LID BMP LOCATIONS IN THE WESTERN-MLK NETWORK



WESTERN-MLK NETWORK ALLEY #1

DESIGN CONSIDERATIONS:

- This alley should focus on pedestrian improvements.
- The width of the alley severely restricts stormwater infiltration opportunities and the alley is suitable for flow through BMPs only.
- The alley surface is concrete.
- Visibility within the alley is high.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	22120
Commercial property (cuft)	0
Industrial property (cuft)	0
Total runoff (cuft)	22120

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	12973
Pervious runoff (cuft)	1991

Soils Information:

Soil name	Chino Silt Loam
KSAT rate (in/hr)	0.81
Field capacity (in/ft)	3.42

Dimensions:

Alley (sqft)	1349
Building Setback (sqft)	1156
Estimated Catchment (sqft)	43765

FIGURE E.28
DETAILED MAP FOR WESTERN-MLK NETWORK ALLEY #1

WESTERN-MLK NETWORK
ALLEY #2

DESIGN CONSIDERATIONS:

- This alley should focus on pedestrian improvements. However, it will be necessary to work with local residents to determine appropriate steps for potential gate removal.
- The width of the alley severely restricts stormwater infiltration opportunities. At either end, the alley is suitable for flow through BMPs only while the middle of the alley could potentially a small scale infiltration BMP.
- The alley surface is concrete.
- Visibility within the alley is high.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	22190
Commercial property (cuft)	0
Industrial property (cuft)	0
Total runoff (cuft)	22190

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	13012
Pervious runoff (cuft)	1997

Soils Information:

Soil name	Chino Silt Loam
KSAT rate (in/hr)	0.81
Field capacity (in/ft)	3.42

Dimensions:

Alley (sqft)	1357
Building Setback (sqft)	761
Estimated Catchment (sqft)	43899



FIGURE E.29
DETAILED MAP FOR WESTERN-MLK
NETWORK ALLEY #2



WESTERN-MLK NETWORK
ALLEY #3

DESIGN CONSIDERATIONS:

- This alley is included in the fitness loop design.
- The alley surface is asphalt.
- Visibility within the alley is moderate to high.
- Though infiltration in the alley is limited, along the west edge of the alley there are some infiltration appropriate areas that could potentially sheet flow from adjacent parking lots.
- CPIO designated Medium Density TOD.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	22840
Commercial property (cuft)	51210
Industrial property (cuft)	0
Total runoff (cuft)	74050

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	47076
Pervious runoff (cuft)	2256

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	6999
Building Setback (sqft)	3923
Estimated Catchment (sqft)	94424

FIGURE E.30
DETAILED MAP FOR WESTERN-MLK NETWORK ALLEY #3

WESTERN-MLK NETWORK ALLEY #4

DESIGN CONSIDERATIONS:

- This alley is included in the fitness loop design.
- The alley surface is asphalt.
- Visibility within the alley is moderate to high.
- This alley is more suited to flow through BMPs though there is one area to the north of the alley that could infiltration BMPs and potentially capture sheet flow from the adjacent street.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	47430
Commercial property (cuft)	0
Industrial property (cuft)	0
Total runoff (cuft)	47430

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	27805
Pervious runoff (cuft)	4284

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	6965
Building Setback (sqft)	5703
Estimated Catchment (sqft)	93845



FIGURE E.31
DETAILED MAP FOR WESTERN-MLK NETWORK ALLEY #4



WESTERN-MLK NETWORK
ALLEY #5

DESIGN CONSIDERATIONS:

- This alley is included in the fitness loop design.
- This alley is more suited to a mix of stormwater BMPs
- The alley surface is concrete.
- Visibility within the alley is moderate to high.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	47440
Commercial property (cuft)	0
Industrial property (cuft)	0
Total runoff (cuft)	47440

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	27808
Pervious runoff (cuft)	4284

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	6964
Building Setback (sqft)	3695
Estimated Catchment (sqft)	93856

FIGURE E.32
DETAILED MAP FOR WESTERN-MLK NETWORK ALLEY #5

WESTERN-MLK NETWORK
ALLEY #6

DESIGN CONSIDERATIONS:

- This alley is included in the fitness loop design.
- This alley is more suited to flow through BMPs though there is one area in the middle of the southern portion of the alley that could an infiltration BMP.
- The alley surface is asphalt.
- Visibility within the alley is moderate to high.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	47440
Commercial property (cuft)	0
Industrial property (cuft)	0
Total runoff (cuft)	47440

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	27812
Pervious runoff (cuft)	4285

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	6957
Building Setback (sqft)	3962
Estimated Catchment (sqft)	93868

FIGURE E.33
DETAILED MAP FOR WESTERN-MLK
NETWORK ALLEY #6





WESTERN-MLK NETWORK
ALLEY #8

DESIGN CONSIDERATIONS:

- This alley should focus on pedestrian improvements.
- The width of the alley severely restricts stormwater infiltration opportunities. This alley is more appropriate for flow through opportunities.
- The alley surface is concrete.
- Visibility within the alley is high.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	22130
Commercial property (cuft)	0
Industrial property (cuft)	0
Total runoff (cuft)	22130

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	12977
Pervious runoff (cuft)	1992

Soils Information:

Soil name	Chino Silt Loam
KSAT rate (in/hr)	0.81
Field capacity (in/ft)	3.42

Dimensions:

Alley (sqft)	1350
Building Setback (sqft)	1249
Estimated Catchment (sqft)	43780

FIGURE E.34
DETAILED MAP FOR WESTERN-MLK NETWORK ALLEY #7

WESTERN-MLK NETWORK
ALLEY #7

DESIGN CONSIDERATIONS:

- This alley should focus on pedestrian improvements.
- The width of the alley severely restricts stormwater infiltration opportunities. This alley is more appropriate for flow through opportunities.
- The alley surface is concrete.
- Visibility within the alley is high.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	22220
Commercial property (cuft)	0
Industrial property (cuft)	0
Total runoff (cuft)	22220

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	13028
Pervious runoff (cuft)	2000

Soils Information:

Soil name	Chino Silt Loam
KSAT rate (in/hr)	0.81
Field capacity (in/ft)	3.42

Dimensions:

Alley (sqft)	1356
Building Setback (sqft)	1170
Estimated Catchment (sqft)	43950

FIGURE E.35
DETAILED MAP FOR WESTERN-MLK
NETWORK ALLEY #8





WESTERN-MLK NETWORK ALLEY #9

DESIGN CONSIDERATIONS:

- This alley is included in the fitness loop design.
- This alley is more suited to flow through BMPs though infiltration opportunities are best in the north end of the alley which could potentially sheet flow from an adjacent parking lot.
- The alley surface is asphalt.
- Visibility within the alley is moderate to high.
- CPIO designated Medium Density TOD.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	24970
Commercial property (cuft)	48720
Industrial property (cuft)	0
Total runoff (cuft)	73690

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	46684
Pervious runoff (cuft)	2439

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	7211
Building Setback (sqft)	3102
Estimated Catchment (sqft)	96241

FIGURE E.36
DETAILED MAP FOR WESTERN-MLK NETWORK ALLEY #9

WESTERN-MLK NETWORK
ALLEY #10

DESIGN CONSIDERATIONS:

- This alley is included in the fitness loop design.
- This alley is more suited to flow through BMPs.
- The alley surface is asphalt.
- Visibility within the alley is moderate to high.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	48620
Commercial property (cuft)	0
Industrial property (cuft)	0
Total runoff (cuft)	48620

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	28500
Pervious runoff (cuft)	4391

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	7214
Building Setback (sqft)	4064
Estimated Catchment (sqft)	96192

FIGURE E.37
DETAILED MAP FOR WESTERN-MLK
NETWORK ALLEY #10





WESTERN-MLK NETWORK
ALLEY #12

DESIGN CONSIDERATIONS:

- This alley is included in the fitness loop design.
- This alley is more suited to flow through BMPs.
- The alley surface is concrete.
- Visibility within the alley is moderate to high.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	48620
Commercial property (cuft)	0
Industrial property (cuft)	0
Total runoff (cuft)	48620

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	28502
Pervious runoff (cuft)	4391

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	7214
Building Setback (sqft)	4658
Estimated Catchment (sqft)	96200

FIGURE E.38
DETAILED MAP FOR WESTERN-MLK NETWORK ALLEY #11

WESTERN-MLK NETWORK
ALLEY #11

DESIGN CONSIDERATIONS:

- This alley is included in the fitness loop design.
- This alley is more suited to a mix of stormwater BMPs and infiltration opportunities are best in the middle of the alley.
- The alley surface is asphalt.
- Visibility within the alley is moderate to high.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	38350
Commercial property (cuft)	21150
Industrial property (cuft)	0
Total runoff (cuft)	59500

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	36391
Pervious runoff (cuft)	3543

Soils Information:

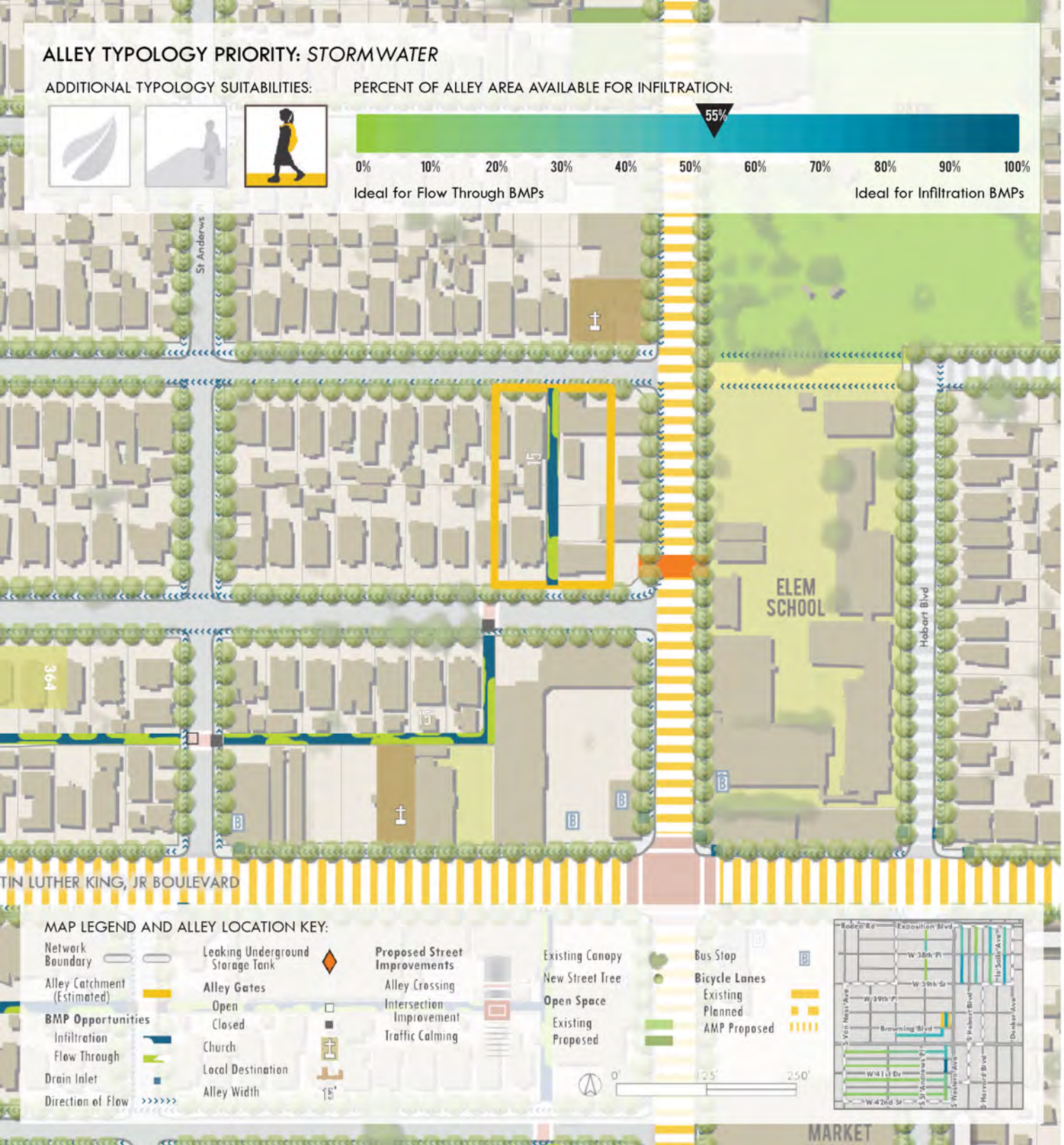
Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	7218
Building Setback (sqft)	3362
Estimated Catchment (sqft)	96202

FIGURE E.39
DETAILED MAP FOR WESTERN-MLK
NETWORK ALLEY #12





WESTERN-MLK NETWORK
ALLEY #13

DESIGN CONSIDERATIONS:

- This alley should prioritize stormwater infiltration design.
- This alley is more suited to a mix of stormwater BMPs. Infiltration opportunities are best in the middle of the alley where sheet flow from adjacent parking lots could be diverted into alley BMPs.
- The alley surface is asphalt.
- Visibility within the alley is high.
- CPIO designated Low Density TOD.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	13150
Commercial property (cuft)	24010
Industrial property (cuft)	0
Total runoff (cuft)	37160

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	23798
Pervious runoff (cuft)	910

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	4100
Building Setback (sqft)	1863
Estimated Catchment (sqft)	43710

FIGURE E.40
DETAILED MAP FOR WESTERN-MLK NETWORK ALLEY #13

WESTERN-MLK NETWORK
ALLEY #14

DESIGN CONSIDERATIONS:

- This alley should prioritize stormwater infiltration design though it will be necessary to work with residents to determine potential gate removal. In addition, redesign efforts should include the alley adjacent church.
- This alley is more suited to a mix of stormwater BMPs. Infiltration opportunities are present at the north end of the alley where sheet flow from the adjacent street could be diverted to alley BMPs.
- The alley surface is asphalt.
- Visibility within the alley is moderate.
- CPIO designated Medium Density TOD.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	19480
Commercial property (cuft)	49020
Industrial property (cuft)	0
Total runoff (cuft)	68500

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	43835
Pervious runoff (cuft)	1705

Soils Information:

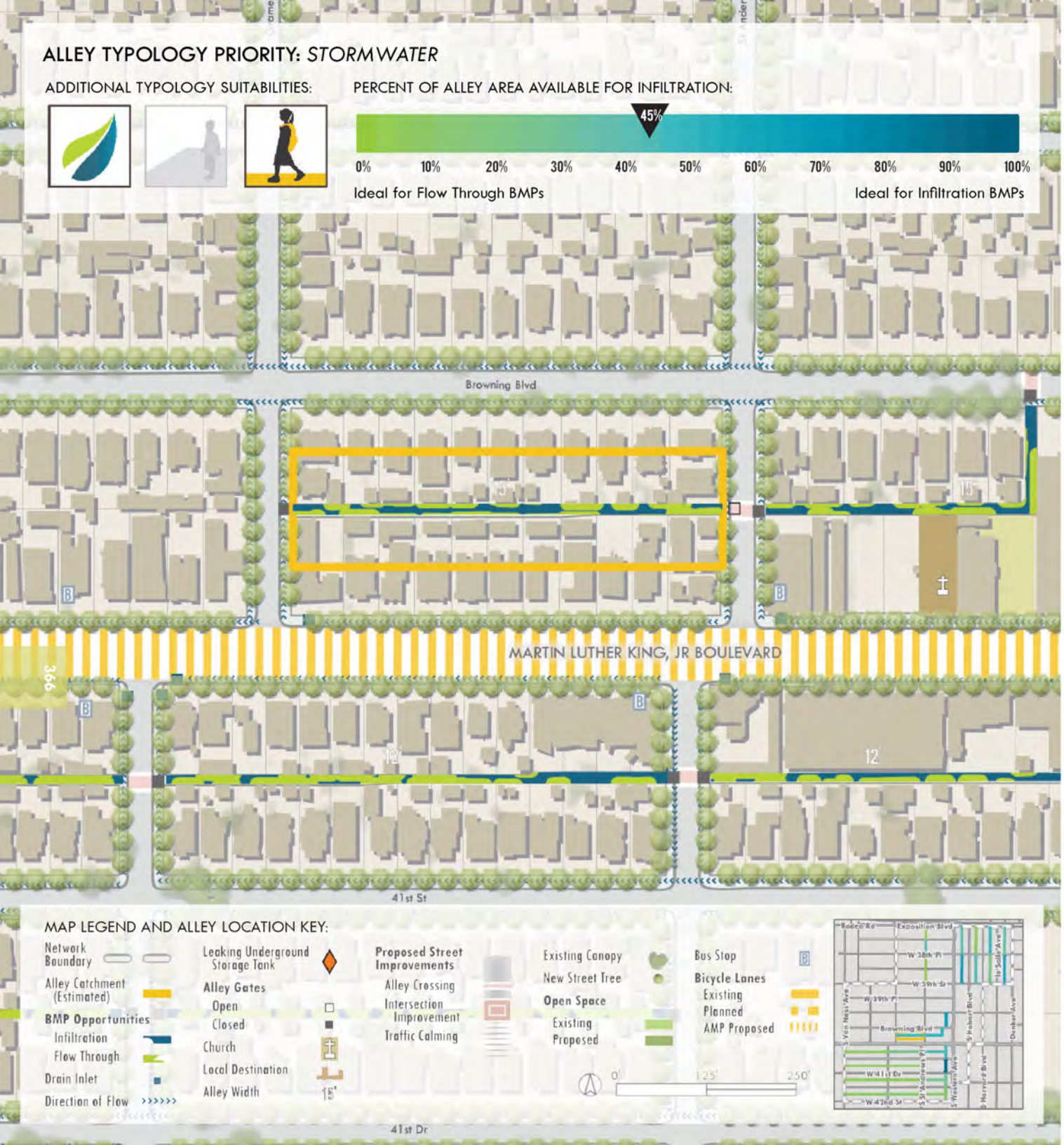
Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	7667
Building Setback (sqft)	3935
Estimated Catchment (sqft)	80176

FIGURE E.41
DETAILED MAP FOR WESTERN-MLK
NETWORK ALLEY #14





WESTERN-MLK NETWORK
ALLEY #15

DESIGN CONSIDERATIONS:

- This alley should prioritize stormwater infiltration design though it will be necessary to work with residents to determine potential gate removal.
- This alley is more suited to a mix of stormwater BMPs .
- The alley surface is asphalt.
- Visibility within the alley is moderate to high.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	76090
Commercial property (cuft)	0
Industrial property (cuft)	0
Total runoff (cuft)	76090

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	48300
Pervious runoff (cuft)	2362

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	8934
Building Setback (sqft)	4913
Estimated Catchment (sqft)	95325

FIGURE E.42
DETAILED MAP FOR WESTERN-MLK NETWORK ALLEY #15

WESTERN-MLK NETWORK
ALLEY #16

DESIGN CONSIDERATIONS:

- This alley should prioritize pedestrian improvements with an urban cooling focus.
- The alley surface is asphalt.
- Visibility within the alley is moderate to high.
- This alley is more suited to flow through BMPs.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	89900
Commercial property (cuft)	0
Industrial property (cuft)	0
Total runoff (cuft)	89900

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	45837
Pervious runoff (cuft)	9824

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	11255
Building Setback (sqft)	8957
Estimated Catchment (sqft)	149902

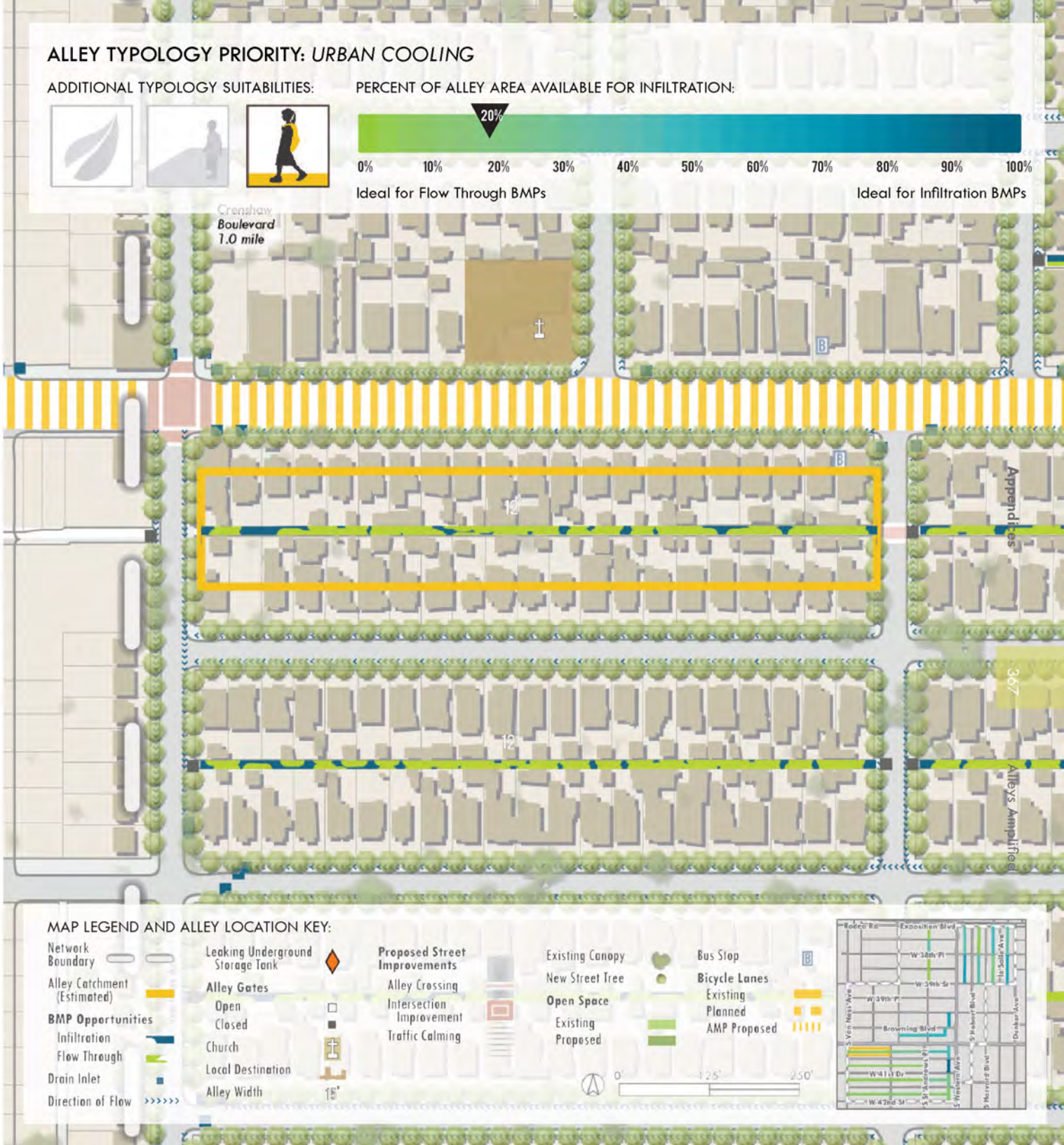
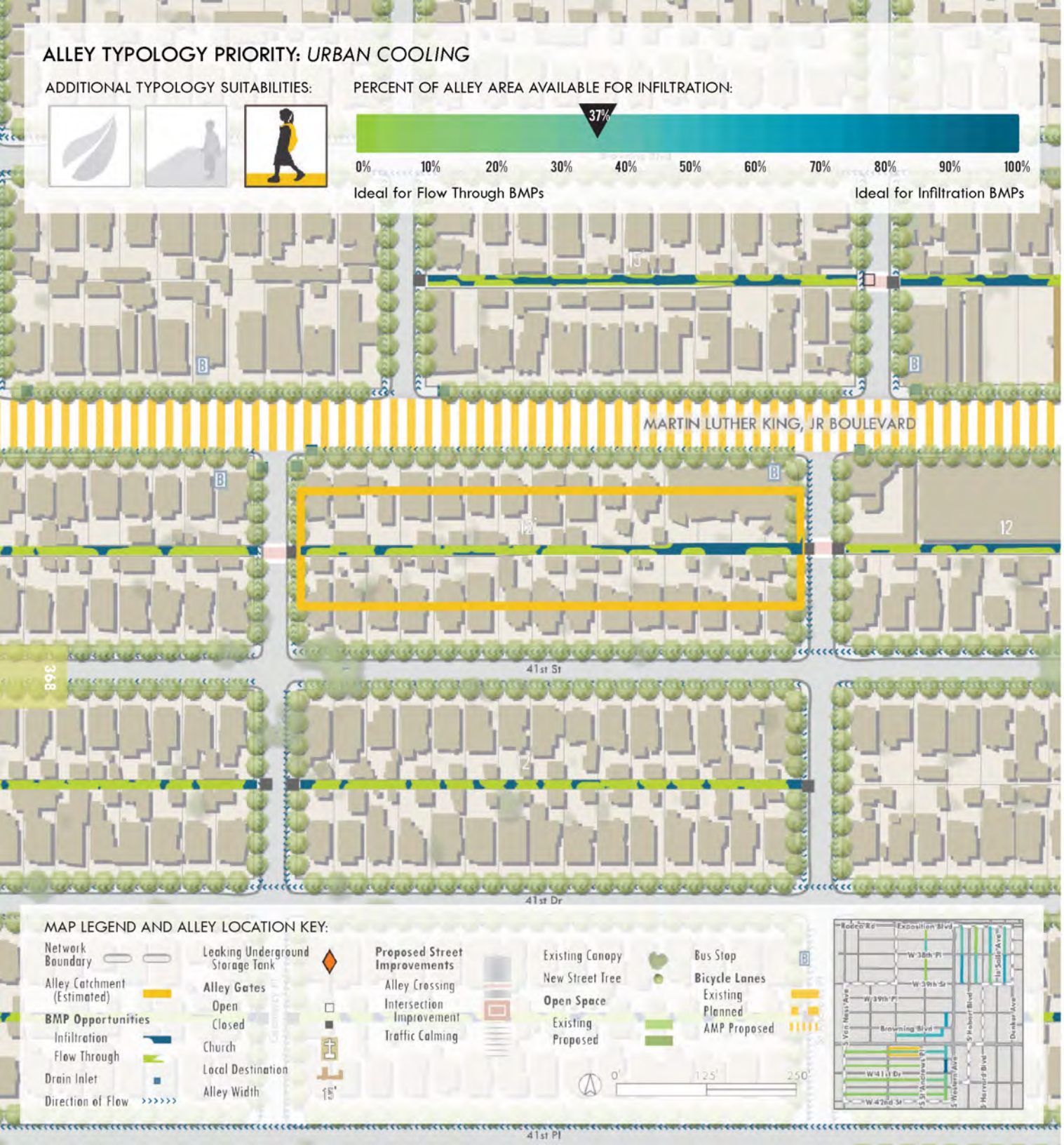


FIGURE E.43
DETAILED MAP FOR WESTERN-MLK NETWORK ALLEY #16



WESTERN-MLK NETWORK
ALLEY #17

DESIGN CONSIDERATIONS:

- This alley should prioritize pedestrian improvements with an urban cooling focus though it will be necessary to work with local residents to determine potential gate removal.
- The alley surface is asphalt.
- Visibility within the alley is moderate to high.
- This alley is predominately suited for flow through BMPs.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	51650
Commercial property (cuft)	16140
Industrial property (cuft)	0
Total runoff (cuft)	67790

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	39245
Pervious runoff (cuft)	5024

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	9123
Building Setback (sqft)	5734
Estimated Catchment (sqft)	110867

FIGURE E.44
DETAILED MAP FOR WESTERN-MLK NETWORK ALLEY #17

WESTERN-MLK NETWORK
ALLEY #18

DESIGN CONSIDERATIONS:

- The north-south segment of this alley is include in the art walk design while the east-west segment should prioritize pedestrian improvements with an urban cooling focus. Work with residents to address the gate at the west end.
- The alley surface is asphalt.
- Visibility is high at north-south running alley and moderate at east-west segment.
- This alley is suitable for a mix of stormwater BMPs, the south end of the north-south segment could sheet flow from the adjacent street.
- CPIO designated Medium Density TOD.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	23530
Commercial property (cuft)	68730
Industrial property (cuft)	0
Total runoff (cuft)	92260

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	59004
Pervious runoff (cuft)	2380

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	10091
Building Setback (sqft)	5524
Estimated Catchment (sqft)	112626

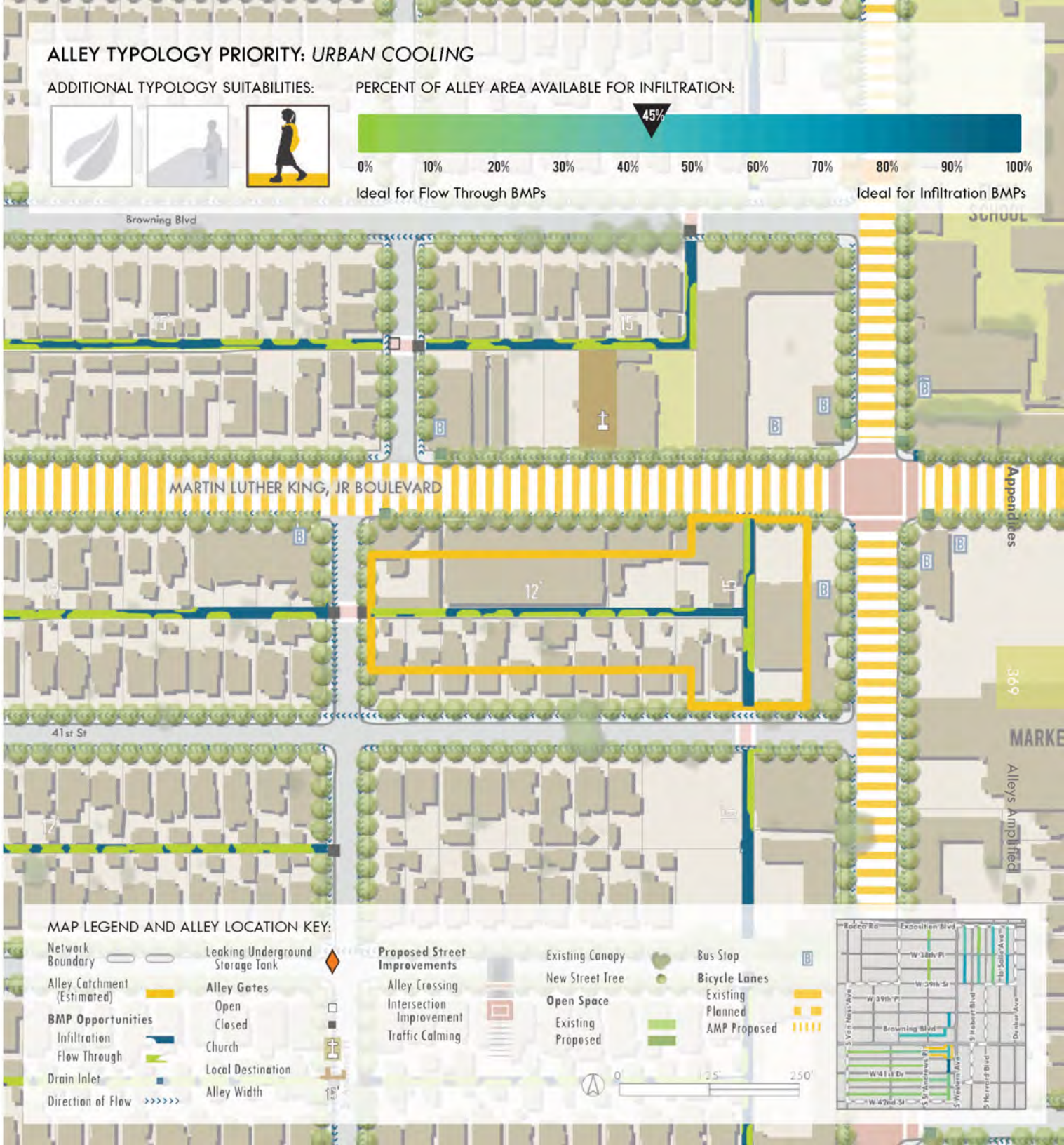
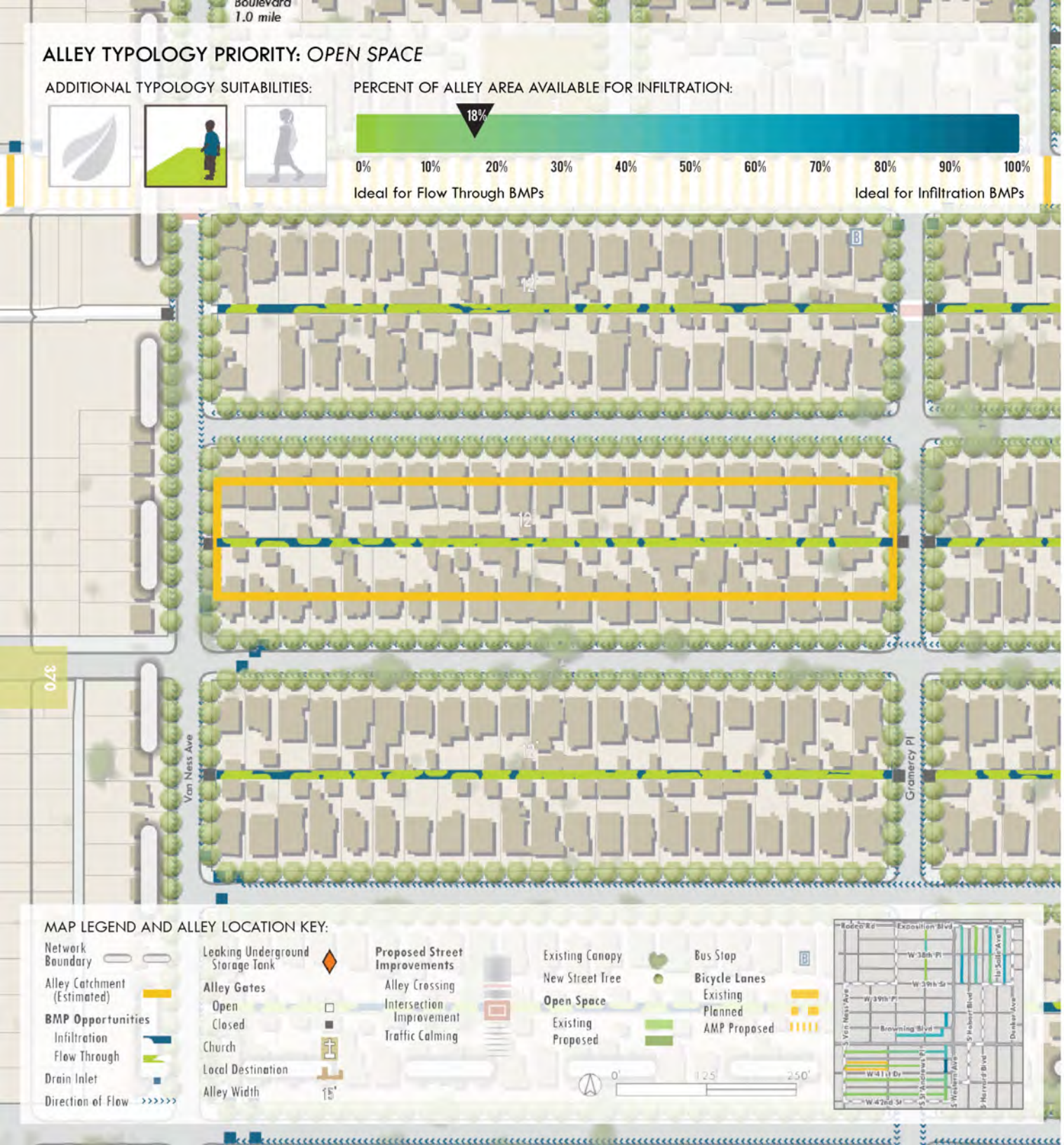


FIGURE E.45
DETAILED MAP FOR WESTERN-MLK
NETWORK ALLEY #18



WESTERN-MLK NETWORK ALLEY #19

DESIGN CONSIDERATIONS:

- This alley should prioritize open space development and/or be decommissioned. It will be necessary to work with residents to determine potential gate removal.
- The alley surface is asphalt.
- Visibility within the alley is moderate to high.
- This alley is suitable for flow through BMPs.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	89430
Commercial property (cuft)	0
Industrial property (cuft)	0
Total runoff (cuft)	89430

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	45841
Pervious runoff (cuft)	9534

Soils Information:

Soil name	Yolo Loam Clay
KSAT rate (in/hr)	0.12
Field capacity (in/ft)	3.93

Dimensions:

Alley (sqft)	11250
Building Setback (sqft)	9181
Estimated Catchment (sqft)	149915

FIGURE E.46
DETAILED MAP FOR WESTERN-MLK NETWORK ALLEY #19

WESTERN-MLK NETWORK
ALLEY #20

DESIGN CONSIDERATIONS:

- This alley should prioritize open space development and/or be decommissioned. It will be necessary to work with residents to determine potential gate removal.
- The alley surface is asphalt.
- Visibility within the alley is moderate to high.
- This alley is suitable for flow through BMPs.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	61420
Commercial property (cuft)	0
Industrial property (cuft)	0
Total runoff (cuft)	61420

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	33515
Pervious runoff (cuft)	6002

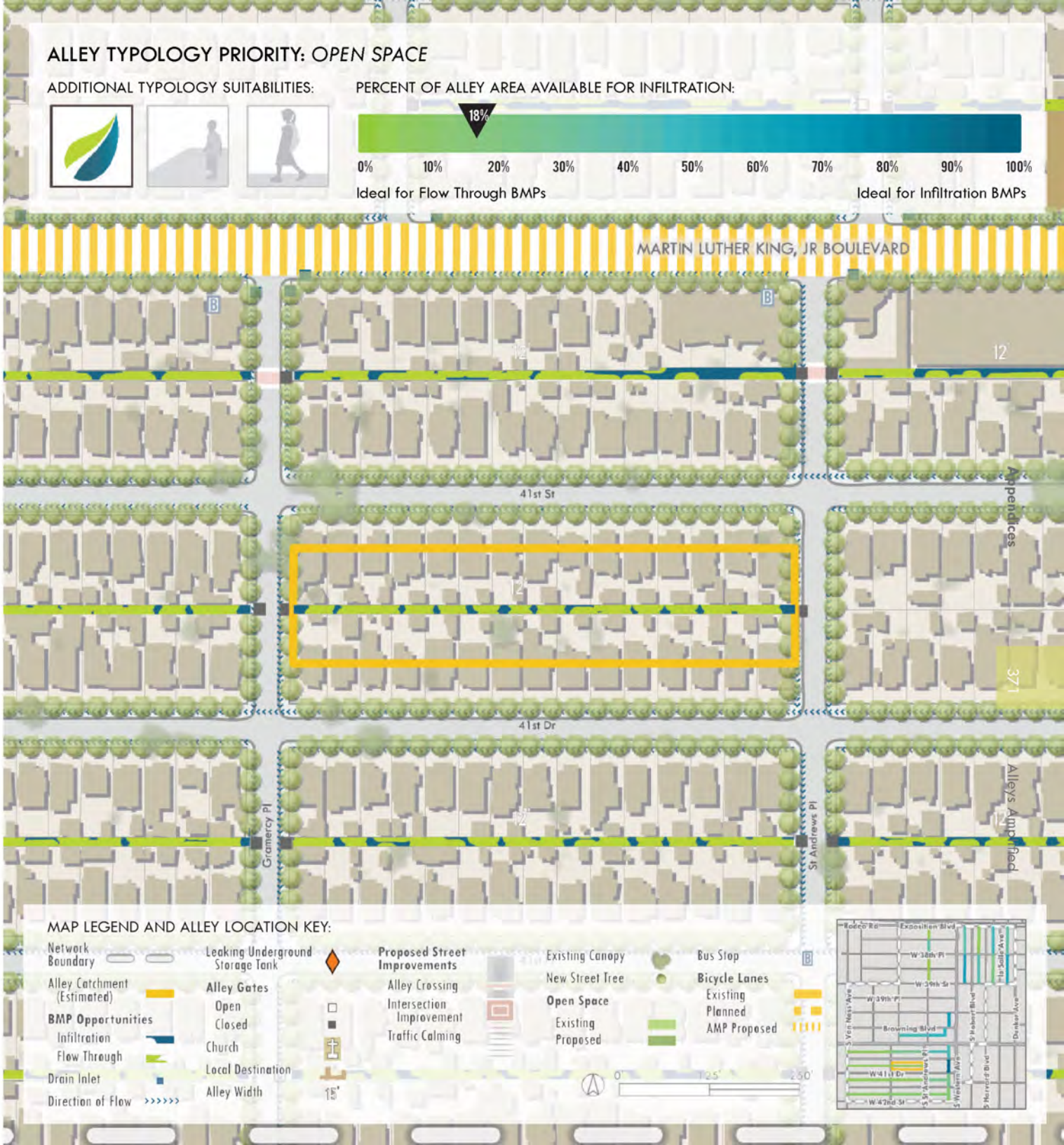
Soils Information:

Soil name	Yolo Loam Clay
KSAT rate (in/hr)	0.12
Field capacity (in/ft)	3.93

Dimensions:

Alley (sqft)	8416
Building Setback (sqft)	6866
Estimated Catchment (sqft)	111194

FIGURE E.47
DETAILED MAP FOR WESTERN-MLK
NETWORK ALLEY #20





WESTERN-MLK NETWORK
ALLEY #21

DESIGN CONSIDERATIONS:

- This alley is part of the art walk design.
- The alley surface is asphalt.
- Visibility within the alley is high.
- The alley has a good potential for infiltration BMPs especially in the south end where sheet flow from the adjacent street could be infiltrated in alley located BMPs.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	0
Commercial property (cuft)	43110
Industrial property (cuft)	0
Total runoff (cuft)	43110

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	28361
Pervious runoff (cuft)	163

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	4008
Building Setback (sqft)	989
Estimated Catchment (sqft)	41678

FIGURE E.48
DETAILED MAP FOR WESTERN-MLK NETWORK ALLEY #21

WESTERN-MLK NETWORK
ALLEY #22

DESIGN CONSIDERATIONS:

- This alley should prioritize open space development though it will be necessary to work with residents to determine potential gate removal.
- This alley is suitable for flow through BMPs.
- The alley surface is asphalt.
- Visibility within the alley is moderate to high.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	88820
Commercial property (cuft)	0
Industrial property (cuft)	0
Total runoff (cuft)	88820

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	45832
Pervious runoff (cuft)	9176

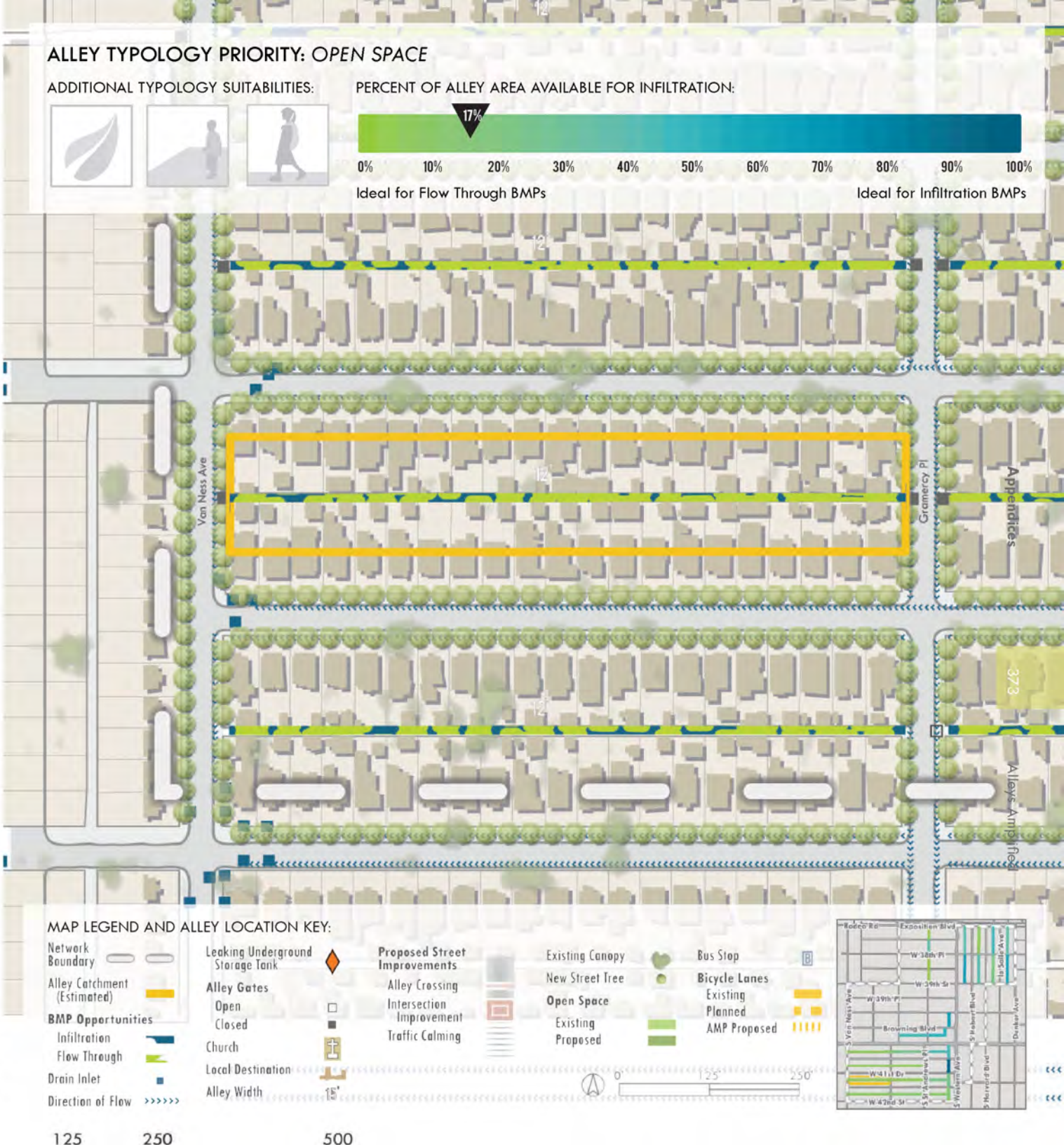
Soils Information:

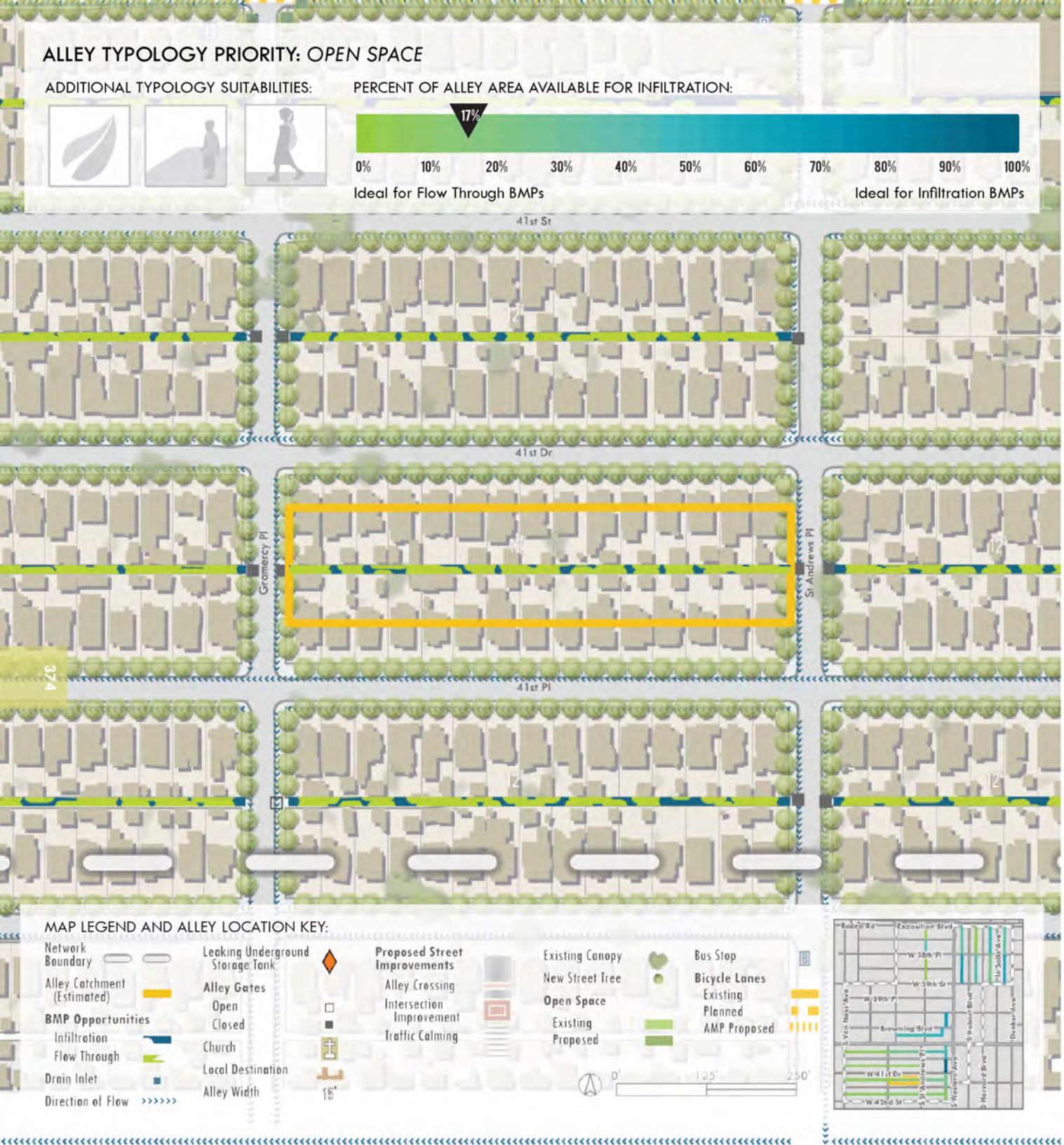
Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	11255
Building Setback (sqft)	9375
Estimated Catchment (sqft)	149886

FIGURE E.49
DETAILED MAP FOR WESTERN-MLK NETWORK ALLEY #22





WESTERN-MLK NETWORK
ALLEY #23

DESIGN CONSIDERATIONS:

- This alley should prioritize open space development though it will be necessary to work with residents to determine potential gate removal.
- This alley is suitable for flow through BMPs.
- The alley surface is asphalt.
- Visibility within the alley is moderate to high.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	62820
Commercial property (cuft)	0
Industrial property (cuft)	0
Total runoff (cuft)	62820

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	33596
Pervious runoff (cuft)	6261

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	8383
Building Setback (sqft)	6966
Estimated Catchment (sqft)	111269

FIGURE E.50
DETAILED MAP FOR WESTERN-MLK NETWORK ALLEY #23

WESTERN-MLK NETWORK
ALLEY #24

DESIGN CONSIDERATIONS:

- The north-south segment of this alley is included in the art walk design while the east-west segment should prioritize open space development. It will be necessary to work with residents to determine potential gate removal at all ends.
- This alley is suitable for flow through BMPs though there are some infiltration opportunities in the north-south running segment.
- The alley surface is asphalt.
- Visibility is high at the north-south running segment and moderate at the east-west running segment.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	46220
Commercial property (cuft)	21260
Industrial property (cuft)	0
Total runoff (cuft)	67480

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	41082
Pervious runoff (cuft)	4251

Soils Information:

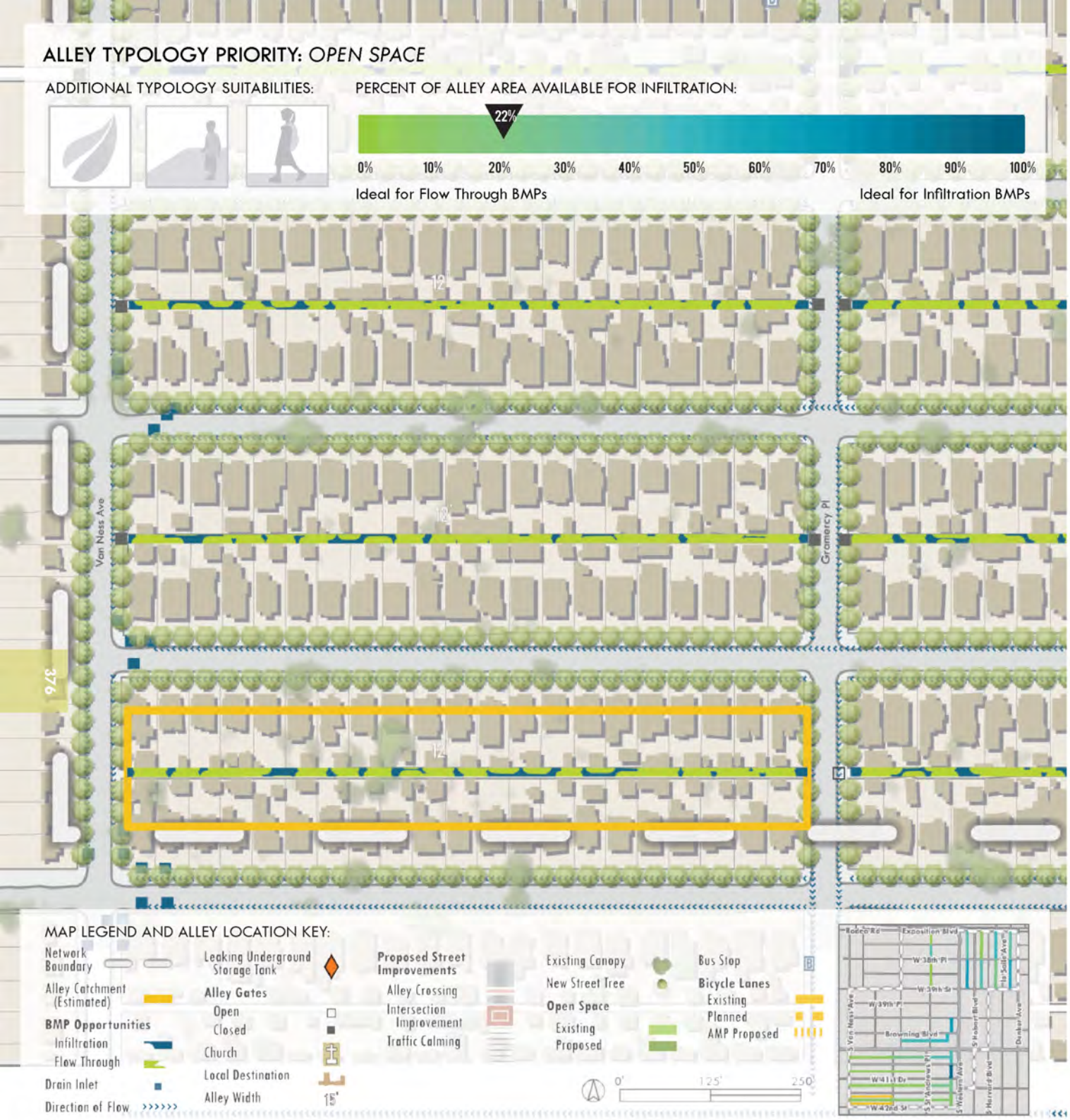
Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	10169
Building Setback (sqft)	6361
Estimated Catchment (sqft)	112110

FIGURE E.51
DETAILED MAP FOR WESTERN-MLK NETWORK ALLEY #24





WESTERN-MLK NETWORK
ALLEY #25

DESIGN CONSIDERATIONS:

- This alley should prioritize open space development though it will be necessary to work with residents to determine potential gate removal.
- This alley is suitable for flow through BMPs.
- The alley surface is asphalt.
- Visibility within the alley is moderate to high.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	88820
Commercial property (cuft)	0
Industrial property (cuft)	0
Total runoff (cuft)	88820

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	45835
Pervious runoff (cuft)	9176

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	11254
Building Setback (sqft)	8729
Estimated Catchment (sqft)	149895

FIGURE E.52
DETAILED MAP FOR WESTERN-MLK NETWORK ALLEY #25

WESTERN-MLK NETWORK
ALLEY #26

DESIGN CONSIDERATIONS:

- This alley should prioritize open space development though it will be necessary to work with residents to determine potential gate removal.
- This alley is suitable for flow through BMPs.
- The alley surface is asphalt.
- Visibility within the alley is moderate to high.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	58040
Commercial property (cuft)	0
Industrial property (cuft)	0
Total runoff (cuft)	58040

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	32204
Pervious runoff (cuft)	5495

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	8458
Building Setback (sqft)	6174
Estimated Catchment (sqft)	111264

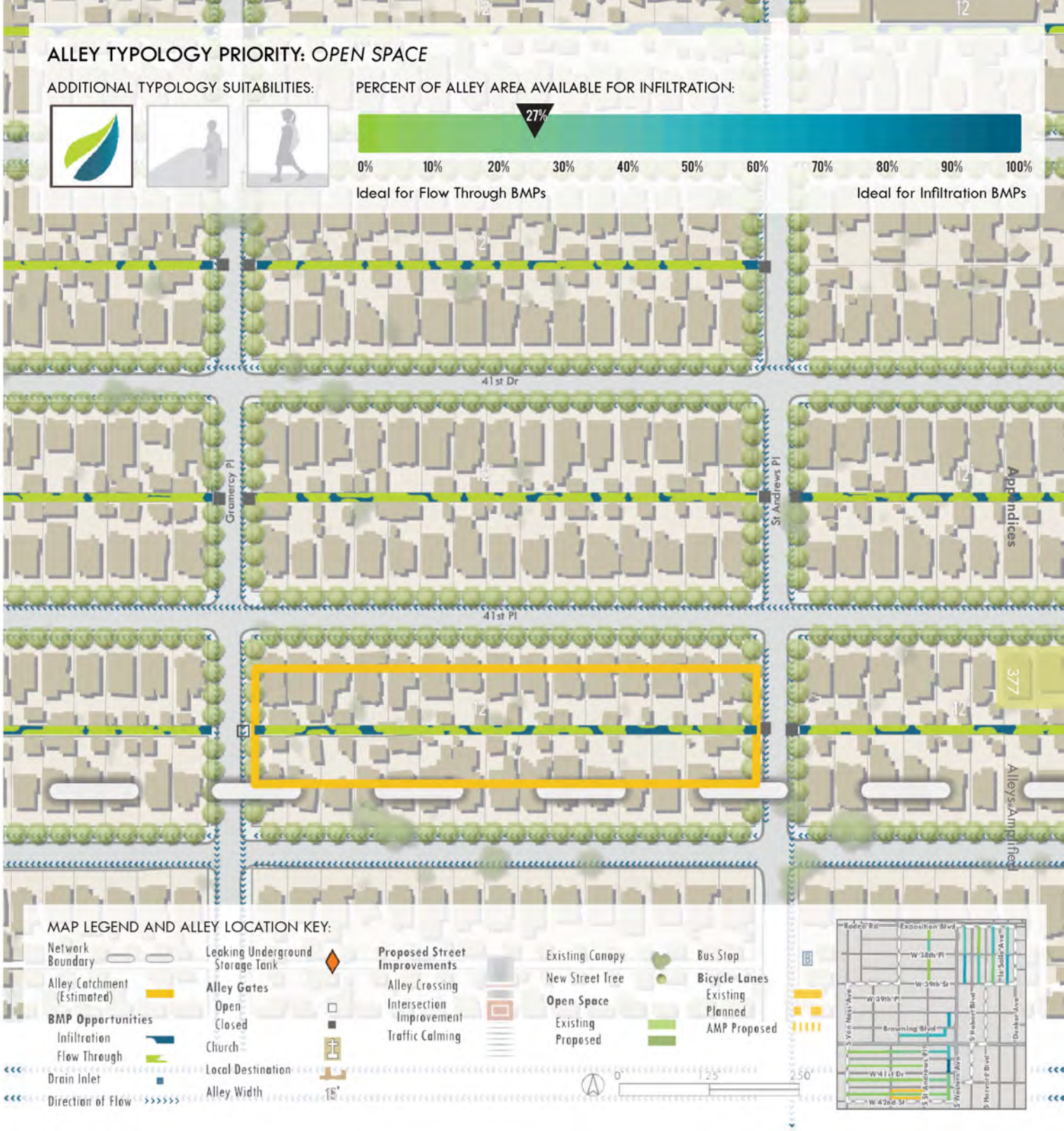


FIGURE E.53
DETAILED MAP FOR WESTERN-MLK NETWORK ALLEY #26



WESTERN-MLK NETWORK
ALLEY #27

DESIGN CONSIDERATIONS:

- The north-south segment of this alley is included in the art walk design while the east-west segment should prioritize open space development. It will be necessary to work with residents to determine potential gate removal at all ends.
- This alley is suitable for flow through BMPs though there are some infiltration opportunities in the north-south running segment.
- The alley surface is asphalt.
- Visibility is high in the north-south running segment and moderate in the east-west running segment.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	39520
Commercial property (cuft)	17150
Industrial property (cuft)	0
Total runoff (cuft)	56670

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	36812
Pervious runoff (cuft)	3224

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	10237
Building Setback (sqft)	7486
Estimated Catchment (sqft)	112951

FIGURE E.54
DETAILED MAP FOR WESTERN-MLK NETWORK ALLEY #27

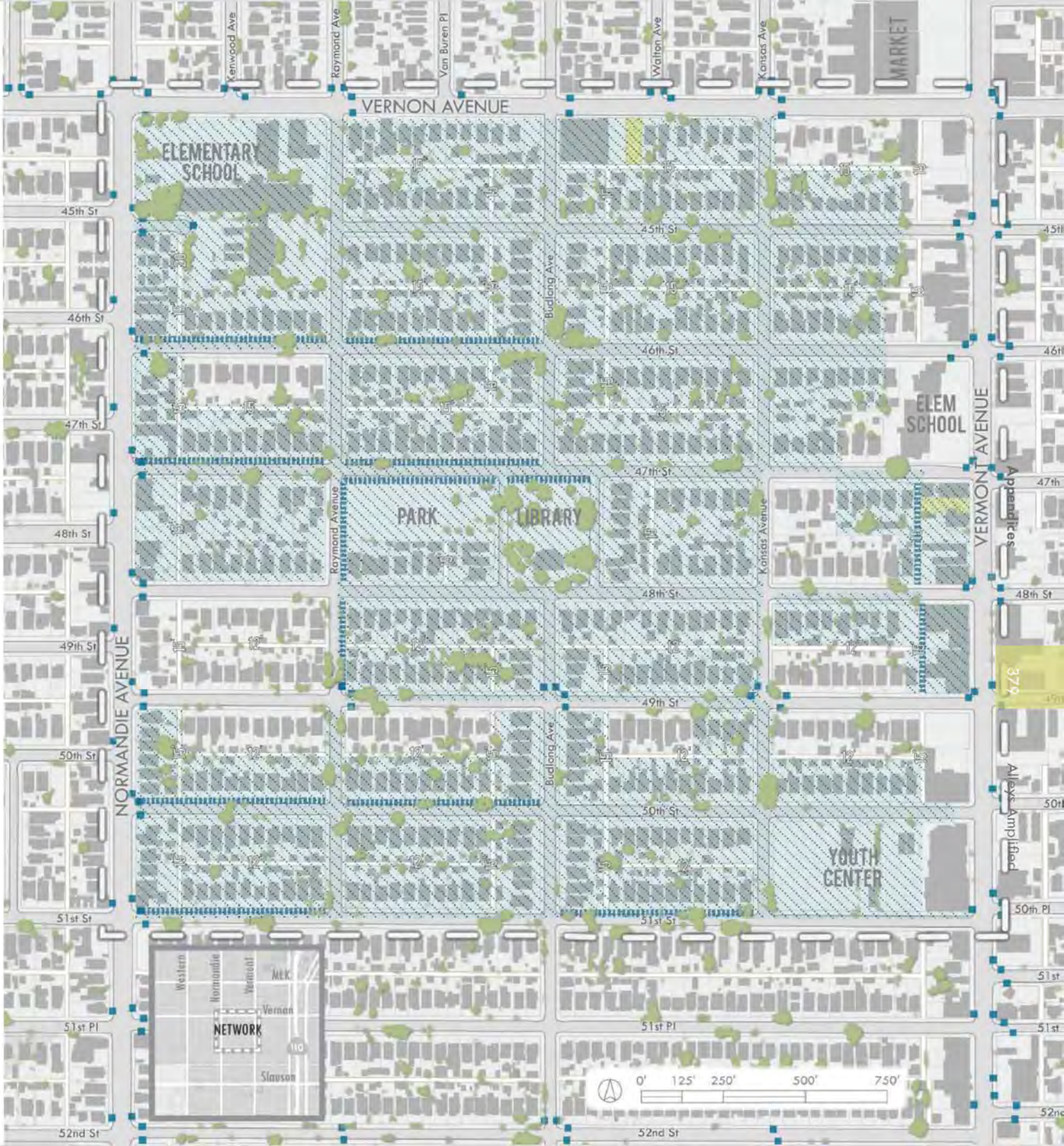


FIGURE E.55
POTENTIAL LID BMP LOCATIONS IN THE VERMONT SQUARE NETWORK



VERMONT SQUARE NETWORK ALLEY #1

DESIGN CONSIDERATIONS:

- The east-west segment is part of the urban agriculture design while the north-south segment should focus on pedestrian improvements. Design efforts must work with residents to determine the potential for gate removal.
- The surface of the alley is asphalt.
- Visibility within the alley is moderate to high in the east-west running segment and moderate in the north-south running segment.
- The alley is suitable for a mix of BMPs; the middle portion of the western alley segment is particularly suitable for infiltration BMPs.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	43070
Commercial property (cuft)	0
Industrial property (cuft)	3680
Total runoff (cuft)	46750

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	29638
Pervious runoff (cuft)	3474

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	11037
Building Setback (sqft)	4992
Estimated Catchment (sqft)	106173

FIGURE E.56
DETAILED MAP FOR VERMONT SQUARE NETWORK ALLEY #1

VERMONT SQUARE NETWORK ALLEY #2

DESIGN CONSIDERATIONS:

- The east-west portion of this alley is part of the urban agriculture design while the north-south portion prioritizes pedestrian improvements. Efforts must work with residents/church to determine the potential gate removal.
- The surface of the alley is asphalt.
- Visibility within the alley is moderate to high in the east-west running segment and moderate in the north-south running segment.
- The alley is suitable for a mix of BMPs; the middle portion of the western alley segment is particularly suitable for infiltration BMPs.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	35860
Commercial property (cuft)	0
Industrial property (cuft)	18400
Total runoff (cuft)	54260

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	35254
Pervious runoff (cuft)	3073

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	11230
Building Setback (sqft)	5217
Estimated Catchment (sqft)	107131



FIGURE E.57
DETAILED MAP FOR VERMONT SQUARE NETWORK ALLEY #2



VERMONT SQUARE NETWORK ALLEY #3

DESIGN CONSIDERATIONS:

- The north-south segment of this alley is included in the art walk design while the east-west segment is included in the urban agriculture design.
- The alley is suitable for a mix of BMPs, the southern end is particularly suitable for infiltration BMPs and could sheet flow from the adjacent street.
- The surface of the alley is concrete.
- Visibility within the alley is high in the north-south running segment and moderate in the east-west running segment.
- CPIO designated Medium Density TOD.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	30790
Commercial property (cuft)	30000
Industrial property (cuft)	0
Total runoff (cuft)	60790

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	40303
Pervious runoff (cuft)	2554

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	11069
Building Setback (sqft)	3368
Estimated Catchment (sqft)	106693

FIGURE E.58
DETAILED MAP FOR VERMONT SQUARE NETWORK ALLEY #3

VERMONT SQUARE NETWORK ALLEY #4

DESIGN CONSIDERATIONS:

- This alley is included in the fitness loop design. Design efforts should involve the adjacent elementary school.
- The surface of the alley is asphalt.
- Visibility within the alley is high.
- The alley is predominately suited for infiltration BMPs.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	4390
Commercial property (cuft)	34260
Industrial property (cuft)	0
Total runoff (cuft)	38650

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	26508
Pervious runoff (cuft)	630

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	5532
Building Setback (sqft)	1403
Estimated Catchment (sqft)	50963

FIGURE E.59
DETAILED MAP FOR VERMONT SQUARE NETWORK ALLEY #4





VERMONT SQUARE NETWORK ALLEY #5

DESIGN CONSIDERATIONS:

- This alley should focus on pedestrian improvements. It will be necessary to work with local residents to determine potential gate removal.
- The surface of the alley is asphalt.
- Visibility within the alley is high in the north-south running segment and moderate in the east-west running segment.
- This alley is suitable for a mix of stormwater BMPs though the southern end of the alley could potentially infiltrate sheet flow from the adjacent street.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	45500
Commercial property (cuft)	0
Industrial property (cuft)	0
Total runoff (cuft)	45500

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	28635
Pervious runoff (cuft)	3624

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	11216
Building Setback (sqft)	5873
Estimated Catchment (sqft)	107431

FIGURE E.60
DETAILED MAP FOR VERMONT SQUARE NETWORK ALLEY #5

VERMONT SQUARE NETWORK ALLEY #6

DESIGN CONSIDERATIONS:

- This alley should focus on pedestrian improvements. It will be necessary to work with local residents to determine potential gate removal.
- The surface of the alley is asphalt at the north-south running segment and overgrown at the east-west running segment.
- Visibility within the alley is high in the north-south running segment and moderate in the east-west running segment.
- This alley is suitable for a mix of stormwater BMPs.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	45900
Commercial property (cuft)	0
Industrial property (cuft)	0
Total runoff (cuft)	45900

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	28888
Pervious runoff (cuft)	3656

Soils Information:

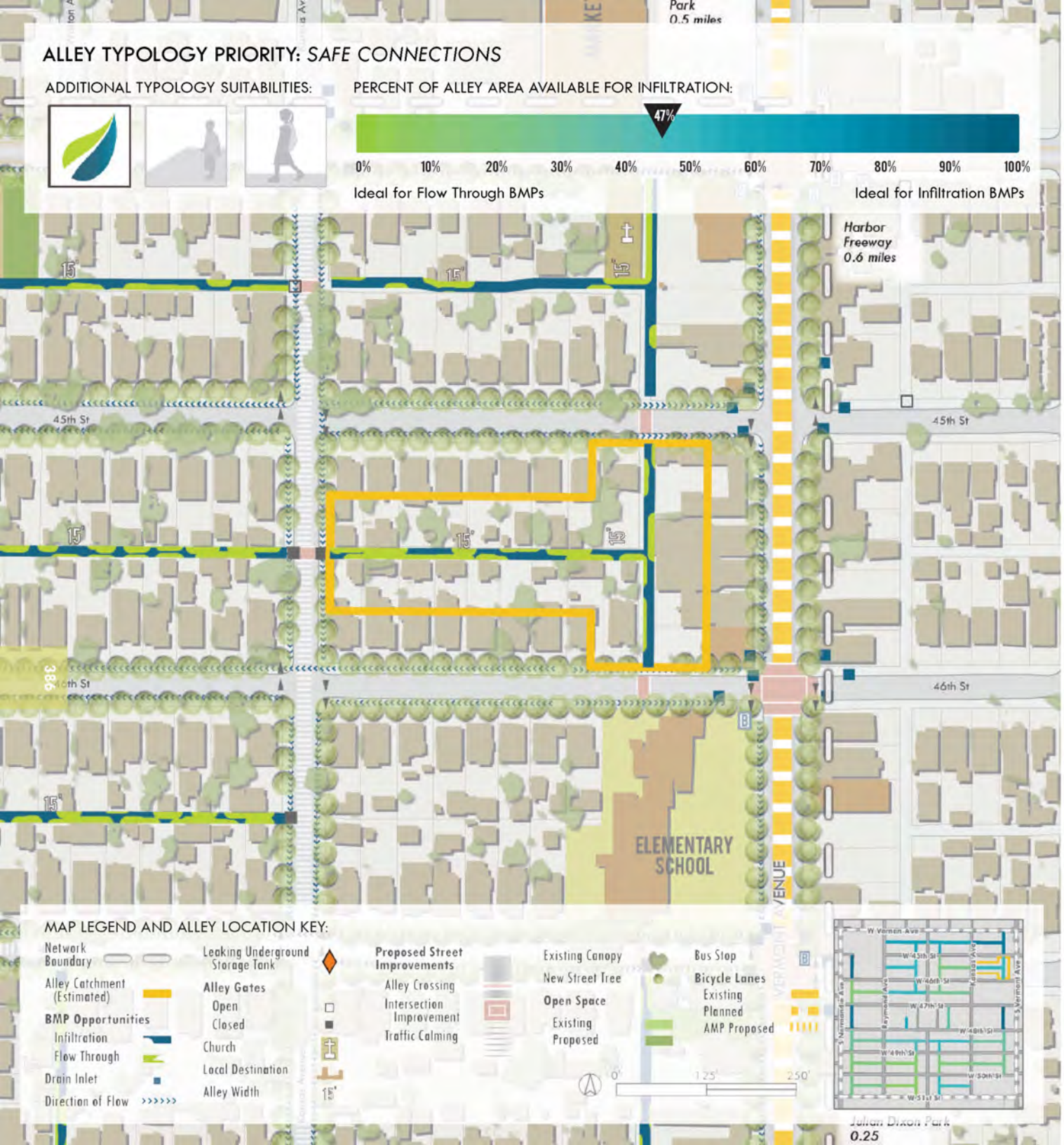
Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	11305
Building Setback (sqft)	7403
Estimated Catchment (sqft)	108379

FIGURE E.61
DETAILED MAP FOR VERMONT SQUARE NETWORK ALLEY #6





VERMONT SQUARE NETWORK ALLEY #7

DESIGN CONSIDERATIONS:

- The north-south running portion of this alley is included in the art walk design while the east-west portion should prioritize pedestrian improvements.
- The surface of the alley is asphalt.
- Visibility within the alley is high in the north-south running segment and moderate in the east-west running segment.
- This alley is suitable for a mix of stormwater BMPs though the southern end of the alley could potentially infiltrate sheet flow from the adjacent street.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	34960
Commercial property (cuft)	22200
Industrial property (cuft)	0
Total runoff (cuft)	57160

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	37486
Pervious runoff (cuft)	2860

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	11236
Building Setback (sqft)	5916
Estimated Catchment (sqft)	107698

FIGURE E.62
DETAILED MAP FOR VERMONT SQUARE NETWORK ALLEY #7

VERMONT SQUARE NETWORK ALLEY #8

DESIGN CONSIDERATIONS:

- The north-south running portion of this alley is included in the fitness loop design while the east-west portion should prioritize pedestrian improvements. Design efforts should work with the adjacent church.
- The surface of the alley is asphalt.
- Visibility within the alley is high in the north-south running segment and moderate in the east-west running segment.
- This alley is suitable for a mix of stormwater BMPs though most areas are appropriate for flow through BMPs only.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	42300
Commercial property (cuft)	7620
Industrial property (cuft)	0
Total runoff (cuft)	49920

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	31937
Pervious runoff (cuft)	3395

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	11342
Building Setback (sqft)	7777
Estimated Catchment (sqft)	108508



FIGURE E.63
DETAILED MAP FOR VERMONT SQUARE NETWORK ALLEY #8



VERMONT SQUARE NETWORK ALLEY #9

DESIGN CONSIDERATIONS:

- This alley should prioritize pedestrian improvements. It will be necessary to work with local residents to determine potential gate removal.
- The surface of the alley is asphalt.
- Visibility within the alley is moderate in the north-south running segment and moderate to high in the east-west running segment.
- This alley is suitable for a mix of stormwater BMPs though infiltration opportunities are best in the middle of the alley.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	44980
Commercial property (cuft)	0
Industrial property (cuft)	0
Total runoff (cuft)	44980

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	28306
Pervious runoff (cuft)	3582

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	11140
Building Setback (sqft)	5822
Estimated Catchment (sqft)	106195

FIGURE E.64
DETAILED MAP FOR VERMONT SQUARE NETWORK ALLEY #9

VERMONT SQUARE NETWORK ALLEY #10

DESIGN CONSIDERATIONS:

- This alley should prioritize pedestrian improvements. It will be necessary to work with local residents to determine potential gate removal.
- The surface of the alley is asphalt.
- Visibility within the alley is moderate in the north-south running segment and moderate to high in the east-west running segment.
- This alley is suitable to a mix of stormwater BMPs though infiltration opportunities are best in the middle of the alley.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	45380
Commercial property (cuft)	0
Industrial property (cuft)	0
Total runoff (cuft)	45380

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	28555
Pervious runoff (cuft)	3614

Soils Information:

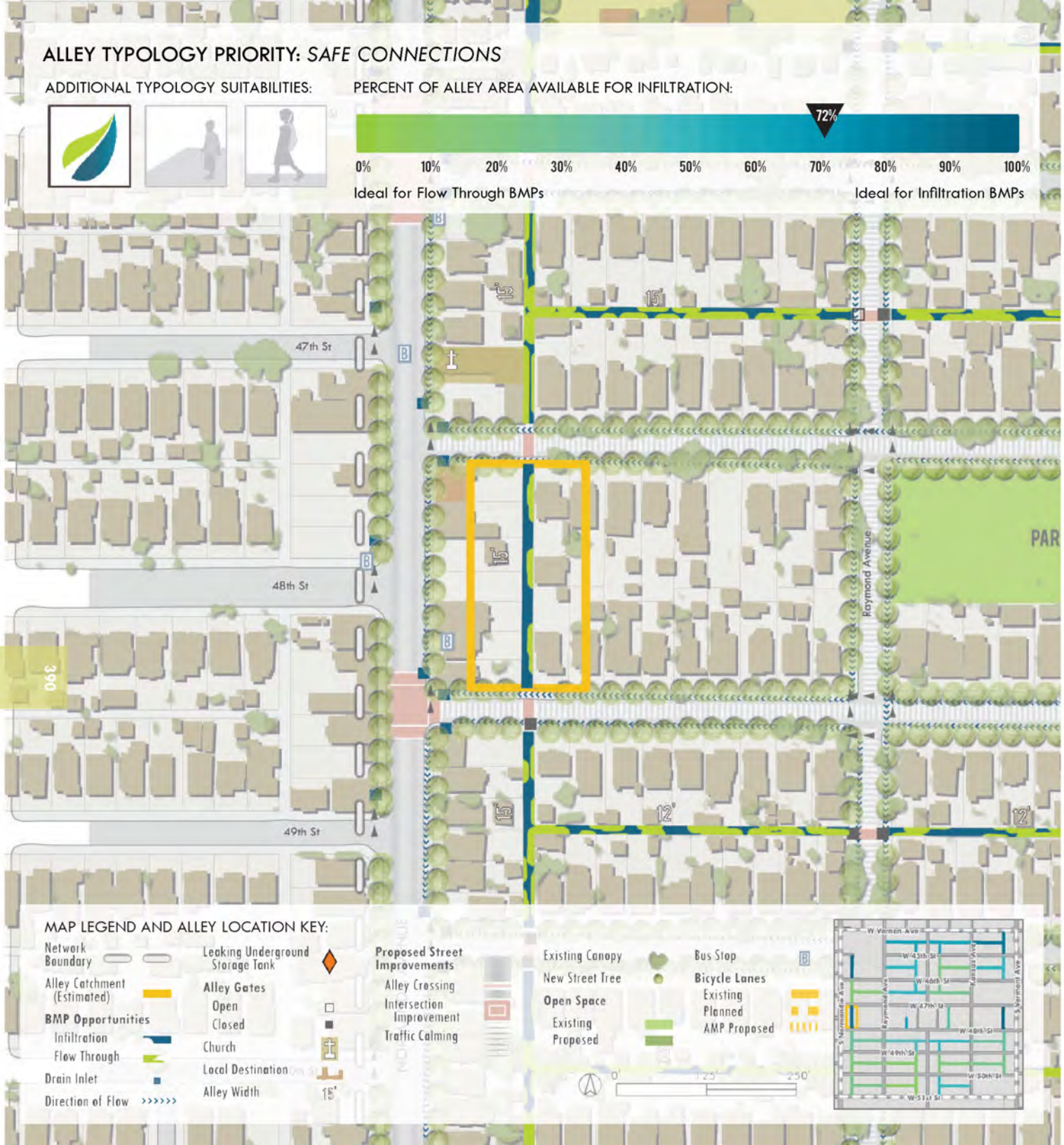
Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	11212
Building Setback (sqft)	6854
Estimated Catchment (sqft)	107131



FIGURE E.65
DETAILED MAP FOR VERMONT SQUARE NETWORK ALLEY #10



VERMONT SQUARE NETWORK ALLEY #11

DESIGN CONSIDERATIONS:

- This alley is included in the fitness loop design.
- The surface of the alley is asphalt.
- Visibility within the alley is high.
- This alley is suitable for infiltration BMPs and there is the potential to divert stormwater from adjacent streets into alley located BMPs.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	10830
Commercial property (cuft)	21300
Industrial property (cuft)	0
Total runoff (cuft)	32130

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	21675
Pervious runoff (cuft)	935

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	4661
Building Setback (sqft)	1307
Estimated Catchment (sqft)	49713

FIGURE E.66
DETAILED MAP FOR VERMONT SQUARE NETWORK ALLEY #11

VERMONT SQUARE NETWORK ALLEY #12

DESIGN CONSIDERATIONS:

- This alley should prioritize pedestrian improvements.
- This alley is suitable to a mix of stormwater BMPs though there are infiltration opportunities at the south end of the alley where there is a potential to infiltrate sheet flow from the adjacent street.
- The surface of the alley is asphalt.
- Visibility within the alley is high.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	8540
Commercial property (cuft)	0
Industrial property (cuft)	0
Total runoff (cuft)	8540

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	5374
Pervious runoff (cuft)	680

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	2181
Building Setback (sqft)	977
Estimated Catchment (sqft)	20160



FIGURE E.67
DETAILED MAP FOR VERMONT SQUARE NETWORK ALLEY #12



VERMONT SQUARE NETWORK ALLEY #13

DESIGN CONSIDERATIONS:

- This alley should prioritize pedestrian improvements.
- This alley is suitable for a mix of stormwater BMPs though infiltration opportunities are at the ends of the alley where there is a potential to infiltrate sheet flow from the adjacent streets.
- The surface of the alley is asphalt.
- Visibility within the alley is high.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	21050
Commercial property (cuft)	0
Industrial property (cuft)	0
Total runoff (cuft)	21050

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	13248
Pervious runoff (cuft)	1677

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	4657
Building Setback (sqft)	2640
Estimated Catchment (sqft)	49702

FIGURE E.68
DETAILED MAP FOR VERMONT SQUARE NETWORK ALLEY #13

VERMONT SQUARE NETWORK ALLEY #14

DESIGN CONSIDERATIONS:

- This alley is included in the art walk design. It will be necessary to work with local residents to determine potential gate removal.
- The surface of the alley is asphalt.
- Visibility within the alley is high.
- This alley is suitable for infiltration BMPs and could potentially divert sheet flow from adjacent streets at both ends into alley located infiltration BMPs.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	10820
Commercial property (cuft)	21320
Industrial property (cuft)	0
Total runoff (cuft)	32140

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	21679
Pervious runoff (cuft)	934

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	4659
Building Setback (sqft)	895
Estimated Catchment (sqft)	49697

FIGURE E.69
DETAILED MAP FOR VERMONT SQUARE NETWORK ALLEY #14





VERMONT SQUARE NETWORK ALLEY #15

DESIGN CONSIDERATIONS:

- The north-south portion of this alley is included in the fitness loop design while the east-west portion is included in urban agricultural designs. It will be necessary to work with local residents to determine potential gate removal.
- The surface of the alley is asphalt at the north-south running segment and overgrown at the east-west running segment.
- Visibility is high at the north-south running segment and moderate at the east-west running segment.
- This alley is suitable for a mix of stormwater BMPs.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	33910
Commercial property (cuft)	19230
Industrial property (cuft)	0
Total runoff (cuft)	53140

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	34752
Pervious runoff (cuft)	2766

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	9266
Building Setback (sqft)	5535
Estimated Catchment (sqft)	101850

FIGURE E.70
DETAILED MAP FOR VERMONT SQUARE NETWORK ALLEY #15

VERMONT SQUARE NETWORK ALLEY #16

DESIGN CONSIDERATIONS:

- This alley includes pedestrian improvements for the north-south portion and west from the intersection of the two segments. Remaining alley is included in urban agricultural designs. It will be necessary to work with local residents to determine gate removal.
- The surface of the alley is asphalt/ overgrown in the western half of the east-west running segment. The remaining segments are asphalt
- Visibility is moderate in the north-south running segment and moderate to high in the east-west running segment.
- This alley is suitable for a mix of BMPs.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	43950
Commercial property (cuft)	0
Industrial property (cuft)	0
Total runoff (cuft)	43950

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	27658
Pervious runoff (cuft)	3500

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	8990
Building Setback (sqft)	4887
Estimated Catchment (sqft)	103766

FIGURE E.71
DETAILED MAP FOR VERMONT SQUARE NETWORK ALLEY #16





VERMONT SQUARE NETWORK ALLEY #17

DESIGN CONSIDERATIONS:

- This alley should focus on pedestrian improvements.
- This alley is suitable for a mix of BMPs
- The surface of the alley is asphalt.
- Visibility is moderate at the north-south running segment and moderate to high at the east-west running segment.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	43780
Commercial property (cuft)	0
Industrial property (cuft)	0
Total runoff (cuft)	43780

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	27552
Pervious runoff (cuft)	3487

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	8969
Building Setback (sqft)	4644
Estimated Catchment (sqft)	103368

FIGURE E.72
DETAILED MAP FOR VERMONT SQUARE NETWORK ALLEY #17

VERMONT SQUARE NETWORK ALLEY #18

DESIGN CONSIDERATIONS:

- The north-south portion of this alley is included in the art walk design while the east-west portion should prioritize pedestrian improvements. It will be necessary to work with local residents to determine gate removal.
- The surface of the alley is asphalt.
- Visibility is high in the north-south running segment and moderate in the east-west running segment.
- This alley is suitable for a mix of BMPs, the south end is suitable for infiltration BMPs. In addition sheet flow from the adjacent street could be diverted into alley located BMPs at the south end.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	34560
Commercial property (cuft)	19700
Industrial property (cuft)	0
Total runoff (cuft)	54260

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	35487
Pervious runoff (cuft)	2819

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	9435
Building Setback (sqft)	5449
Estimated Catchment (sqft)	103912



FIGURE E.73
DETAILED MAP FOR VERMONT SQUARE NETWORK ALLEY #18



VERMONT SQUARE NETWORK ALLEY #19

DESIGN CONSIDERATIONS:

- The north-south portion of this alley is included in the fitness loop design while the east-west portion should prioritize urban agriculture. It will be necessary to work with local residents to determine gate removal.
- This alley is suitable for a mix of BMPs. The north end, suitable for infiltration BMPs, could sheet flow from the adjacent street.
- The north-south segment is concrete, the east-west segment is overgrown.
- Visibility is high at the north-south running segment and moderate at the east-west running segment.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	38560
Commercial property (cuft)	9680
Industrial property (cuft)	0
Total runoff (cuft)	48240

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	30982
Pervious runoff (cuft)	3144

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	9378
Building Setback (sqft)	6301
Estimated Catchment (sqft)	101868

FIGURE E.74
DETAILED MAP FOR VERMONT SQUARE NETWORK ALLEY #19

VERMONT SQUARE NETWORK ALLEY #20

DESIGN CONSIDERATIONS:

- The north-south portion of this alley should prioritize pedestrian improvements while the east-west portion should prioritize urban agriculture. It will be necessary to work with local residents to determine gate removal.
- This alley is suitable for a mix of BMPs.
- The surface of the alley is asphalt at the north-south running segment and overgrown at the east-west running segment.
- Visibility is high in the north-south running segment and moderate in the east-west running segment.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	43630
Commercial property (cuft)	0
Industrial property (cuft)	0
Total runoff (cuft)	43630

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	27387
Pervious runoff (cuft)	3547

Soils Information:

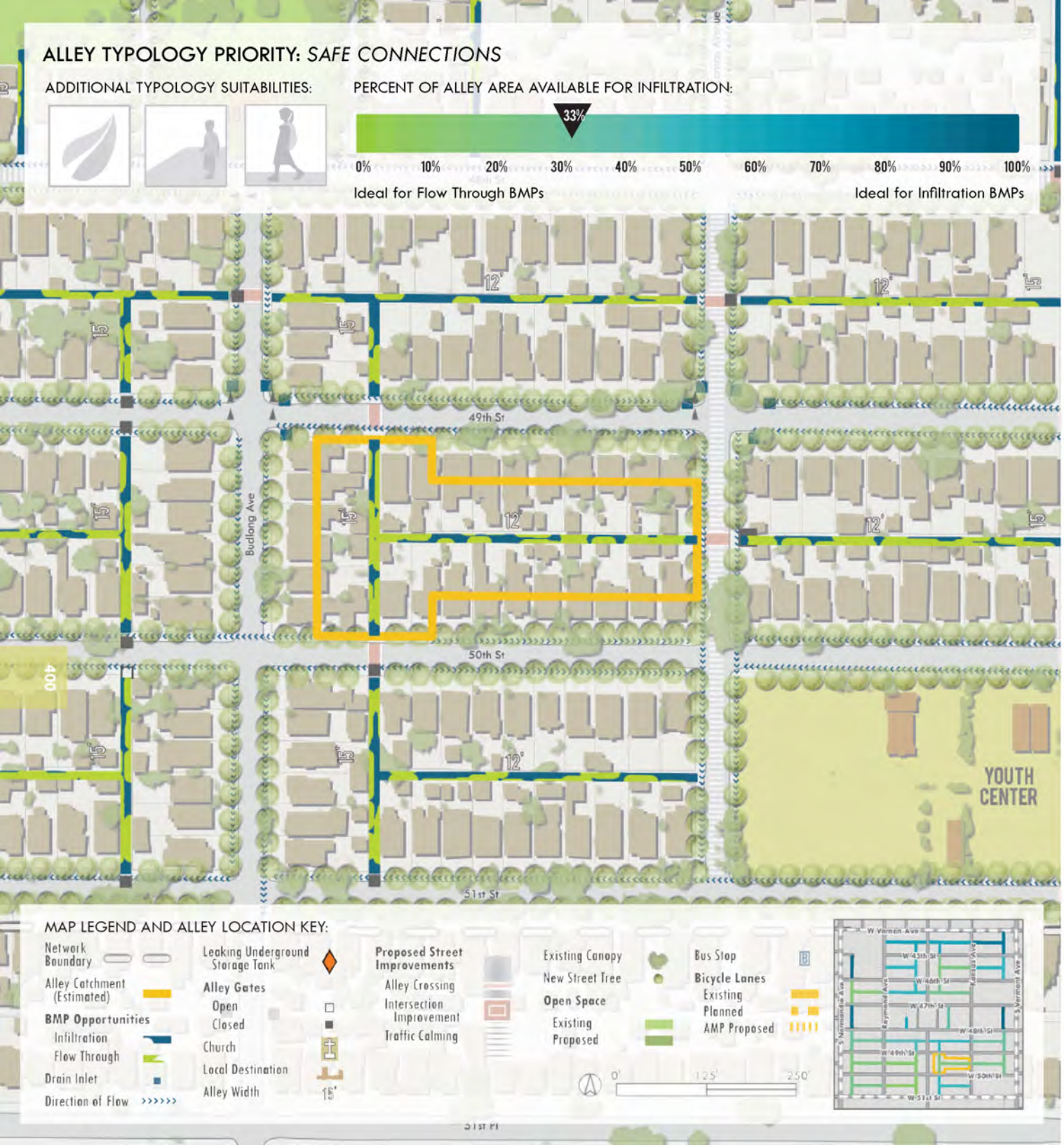
Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	9404
Building Setback (sqft)	6788
Estimated Catchment (sqft)	102749

FIGURE E.75
DETAILED MAP FOR VERMONT SQUARE NETWORK ALLEY #20





VERMONT SQUARE NETWORK ALLEY #21

DESIGN CONSIDERATIONS:

- This alley should prioritize pedestrian improvements.
- The surface of the alley is asphalt.
- Visibility is high in the north-south running segment and moderate in the east-west running segment.
- This alley is suitable for a mix of stormwater BMPs though there are more areas that are appropriate for flow through BMPs.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	43360
Commercial property (cuft)	0
Industrial property (cuft)	0
Total runoff (cuft)	43360

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	27284
Pervious runoff (cuft)	3453

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	9402
Building Setback (sqft)	6310
Estimated Catchment (sqft)	102362

FIGURE E.76
DETAILED MAP FOR VERMONT SQUARE NETWORK ALLEY #21

VERMONT SQUARE NETWORK ALLEY #22

DESIGN CONSIDERATIONS:

- The north-south segment is included in the art walk design while the east-west should prioritize pedestrian improvements. Residents should be consulted regarding any gate removal.
- Alley is suitable for a mix of BMPs, the north end is suitable for infiltration and sheet flow from the adjacent street could be diverted into alley located BMPs.
- The north-south running segment is asphalt and the east-west running segment is overgrown.
- Visibility is high in the north-south segment and moderate in the east-west segment.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	34750
Commercial property (cuft)	19330
Industrial property (cuft)	0
Total runoff (cuft)	54080

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	35352
Pervious runoff (cuft)	2833

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	9539
Building Setback (sqft)	5987
Estimated Catchment (sqft)	103949

FIGURE E.77
DETAILED MAP FOR VERMONT SQUARE NETWORK ALLEY #22





VERMONT SQUARE NETWORK ALLEY #23

DESIGN CONSIDERATIONS:

- The north-south portion of this alley is included in the fitness loop design while the east-west portion should prioritize urban agriculture. It will be necessary to work with local residents to determine gate removal at the east end.
- This alley is suitable for a mix of BMPs. The south end, suitable for infiltration BMPs, could sheet flow from the adjacent street.
- The surface of the alley is asphalt.
- Visibility is high in the north-south running segment and moderate in the east-west running segment.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	43150
Commercial property (cuft)	0
Industrial property (cuft)	0
Total runoff (cuft)	43150

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	27154
Pervious runoff (cuft)	3439

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	9334
Building Setback (sqft)	5801
Estimated Catchment (sqft)	101874

FIGURE E.78
DETAILED MAP FOR VERMONT SQUARE NETWORK ALLEY #23

VERMONT SQUARE NETWORK ALLEY #24

DESIGN CONSIDERATIONS:

- The north-south portion of this alley should prioritize pedestrian improvements while the east-west portion should prioritize urban agriculture. Residents should be consulted regarding any gate removal.
- This alley is suitable for flow through BMPs.
- The north-south running segment is asphalt and the east-west running segment is overgrown.
- Visibility is high in the north-south running segment and moderate in the east-west running segment.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	43700
Commercial property (cuft)	0
Industrial property (cuft)	0
Total runoff (cuft)	43700

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	27385
Pervious runoff (cuft)	3602

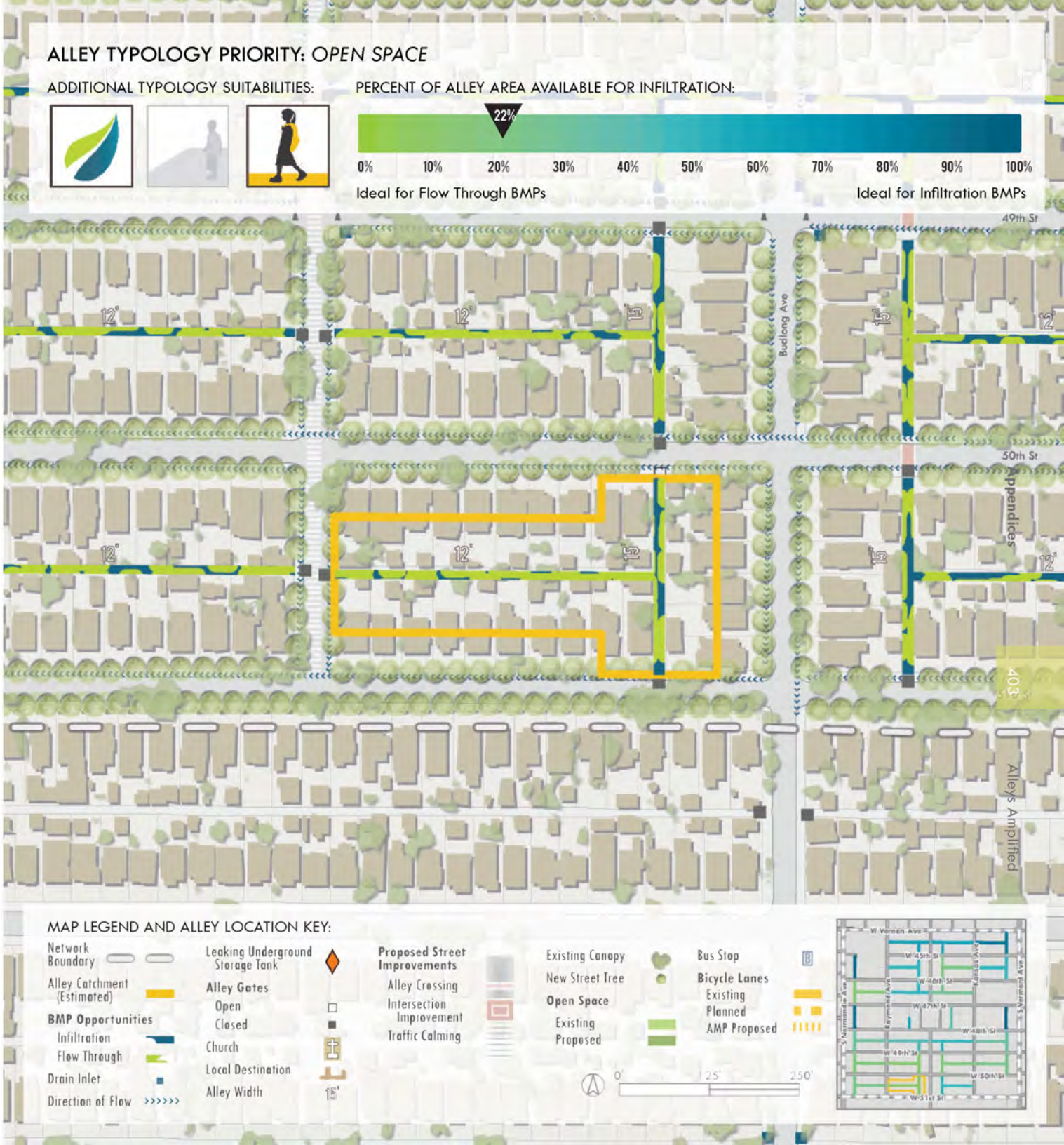
Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	9406
Building Setback (sqft)	7353
Estimated Catchment (sqft)	102742

FIGURE E.79
DETAILED MAP FOR VERMONT SQUARE NETWORK ALLEY #24





VERMONT SQUARE NETWORK ALLEY #25

DESIGN CONSIDERATIONS:

- This alley should prioritize pedestrian improvements.
- This alley is suitable for a mix of stormwater BMPs. The west end of the alley is suitable for infiltration BMPs and could sheet flow from the adjacent street.
- The surface of the alley is overgrown at the north-south running segment and asphalt at the east-west running segment.
- Visibility is high in the north-south running segment and moderate in the east-west running segment.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	43360
Commercial property (cuft)	0
Industrial property (cuft)	0
Total runoff (cuft)	43360

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	27284
Pervious runoff (cuft)	3453

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

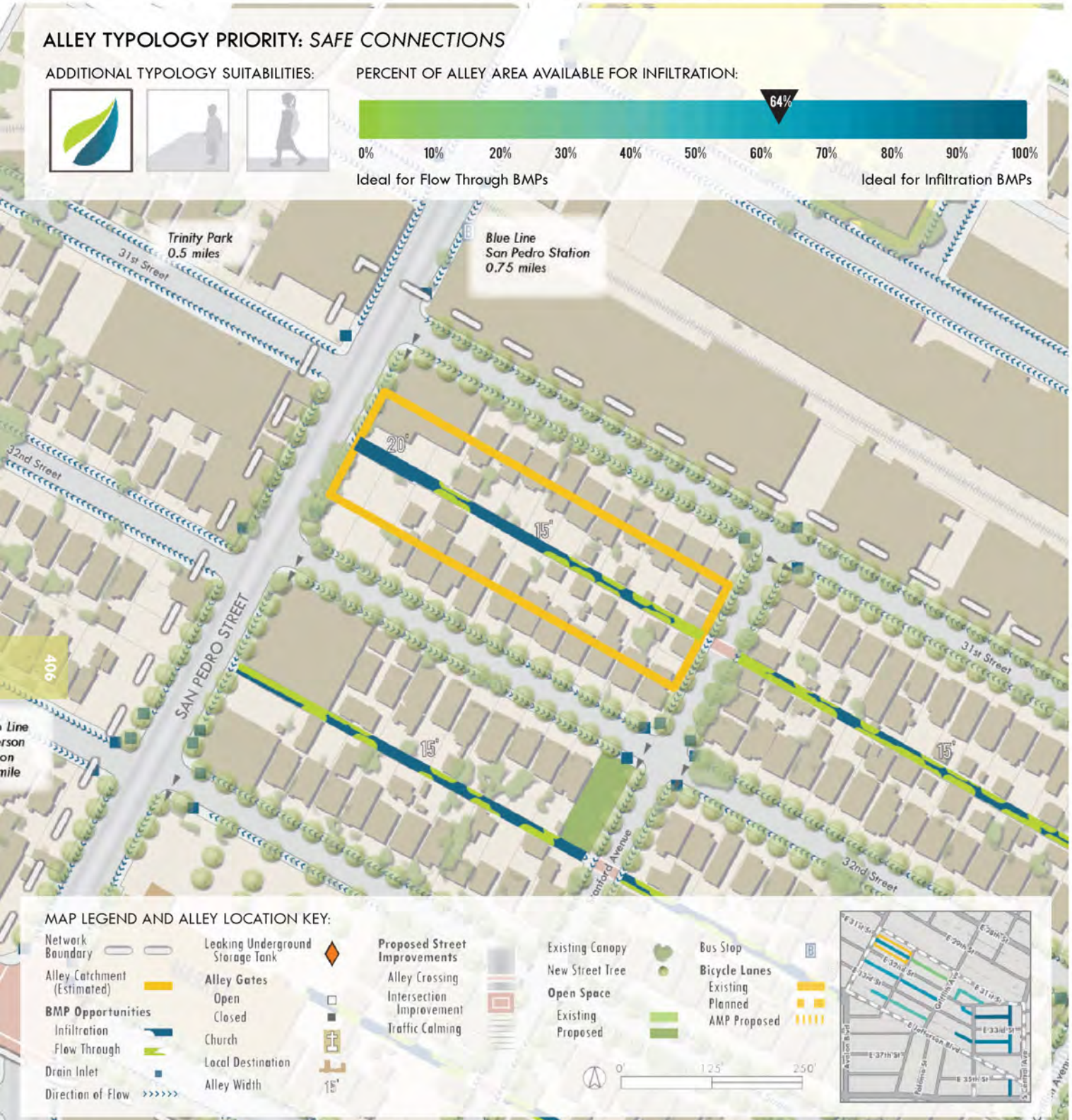
Dimensions:

Alley (sqft)	9385
Building Setback (sqft)	5027
Estimated Catchment (sqft)	102361

FIGURE E.80
DETAILED MAP FOR VERMONT SQUARE NETWORK ALLEY #25



FIGURE E.81
POTENTIAL LID BMP LOCATIONS IN THE QUINCY JONES NETWORK



QUINCY JONES NETWORK ALLEY #1

DESIGN CONSIDERATIONS:

- This alley is part of the fitness loop design.
- This alley suitable for a mix of stormwater BMPs though the north-east end of the alley could infiltration BMPs and there is the potential to divert sheet flow from the adjacent street into alley located BMPs.
- The surface of the alley is concrete.
- Visibility is moderately high for a very small portion at the north-western entrance into the alley. The remaining majority drops to moderate.
- The most northern portion is CPIO designated Hybrid Industrial.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	44460
Commercial property (cuft)	22590
Industrial property (cuft)	0
Total runoff (cuft)	67050

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	42321
Pervious runoff (cuft)	2393

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	8710
Building Setback (sqft)	3176
Estimated Catchment (sqft)	87692

FIGURE E.82
DETAILED MAP FOR QUINCY JONES NETWORK ALLEY #1

QUINCY JONES NETWORK ALLEY #2

DESIGN CONSIDERATIONS:

- This alley is part of the fitness loop design.
- This alley suitable for infiltration BMPs. Some sheet flow from adjacent streets could be directed into alley BMPs at the south end. In addition, a vacant lot located to the north west of the southerly end of the alley could become new open space and serve as more space for infiltration.
- The surface of the alley is concrete.
- Visibility within the alley is moderate.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	46200
Commercial property (cuft)	19880
Industrial property (cuft)	0
Total runoff (cuft)	66080

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	41606
Pervious runoff (cuft)	2473

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	8142
Building Setback (sqft)	3577
Estimated Catchment (sqft)	87656



FIGURE E.83
DETAILED MAP FOR QUINCY JONES NETWORK ALLEY #2



QUINCY JONES NETWORK ALLEY #3

DESIGN CONSIDERATIONS:

- This alley is part of the fitness loop design.
- The surface of the alley is concrete.
- Visibility within the alley is moderate.
- This alley is suitable for a mix of stormwater BMPs though in most areas flow through BMPs are the only suitable option.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	67480
Commercial property (cuft)	0
Industrial property (cuft)	0
Total runoff (cuft)	67480

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	41676
Pervious runoff (cuft)	3503

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	9358
Building Setback (sqft)	6340
Estimated Catchment (sqft)	100129

FIGURE E.84
DETAILED MAP FOR QUINCY JONES NETWORK ALLEY #3

QUINCY JONES NETWORK ALLEY #4

DESIGN CONSIDERATIONS:

- This alley is part of the fitness loop design.
- The surface of the alley is concrete.
- Visibility within the alley is high.
- This alley is suited to a mix of stormwater BMPs, though the northern end of the alley is suitable for infiltration BMPs that could potentially infiltrate sheet flow from the alley adjacent market parking lot.
- Redesign efforts should partner with the local market.
- CPIO designated TOD High Density Neighborhood Serving Corridor.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	21180
Commercial property (cuft)	58640
Industrial property (cuft)	0
Total runoff (cuft)	79820

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	51535
Pervious runoff (cuft)	1448

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	3784
Building Setback (sqft)	1866
Estimated Catchment (sqft)	88132

FIGURE E.85
DETAILED MAP FOR QUINCY JONES NETWORK ALLEY #4





QUINCY JONES NETWORK ALLEY #5

DESIGN CONSIDERATIONS:

- This alley is part of the fitness loop design.
- The surface of the alley is asphalt.
- Visibility within the alley is moderate.
- This alley is suitable for a mix of stormwater BMPs with good infiltration potential in the middle of the alley and at the south end where sheet flow from the adjacent street could be diverted into alley located infiltration BMPs.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	66910
Commercial property (cuft)	0
Industrial property (cuft)	0
Total runoff (cuft)	66910

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	41321
Pervious runoff (cuft)	3473

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	9292
Building Setback (sqft)	3569
Estimated Catchment (sqft)	99276

FIGURE E.86
DETAILED MAP FOR QUINCY JONES NETWORK ALLEY #5

QUINCY JONES NETWORK ALLEY #6

DESIGN CONSIDERATIONS:

- This alley is part of the fitness loop design.
- The surface of the alley is concrete.
- Visibility within the alley is moderate.
- This alley is suitable for a mix of stormwater BMPs with good infiltration potential in the middle of the alley.
- CPIO designated Hybrid Limited.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	45170
Commercial property (cuft)	18540
Industrial property (cuft)	13050
Total runoff (cuft)	76760

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	48570
Pervious runoff (cuft)	2587

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	9202
Building Setback (sqft)	5123
Estimated Catchment (sqft)	98351

FIGURE E.87
DETAILED MAP FOR QUINCY JONES NETWORK ALLEY #6





QUINCY JONES NETWORK ALLEY #7

DESIGN CONSIDERATIONS:

- The north-east running portion is part of the urban agriculture design while the south-west running portion is part of a stormwater design focus.
- The surface of the alley is asphalt.
- Visibility within the alley is moderately high at the north-south running segment and moderate at the east-west running segment.
- Suitable for a mix of stormwater BMPs with good infiltration potential in the south-west running portion where there is the potential to infiltrate sheet flow from the adjacent parking lot.
- CPIO designated Hybrid Industrial.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	22840
Commercial property (cuft)	0
Industrial property (cuft)	47690
Total runoff (cuft)	70530

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	45018
Pervious runoff (cuft)	1875

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	8796
Building Setback (sqft)	4778
Estimated Catchment (sqft)	82043

FIGURE E.88
DETAILED MAP FOR QUINCY JONES NETWORK ALLEY #7

QUINCY JONES NETWORK ALLEY #8

DESIGN CONSIDERATIONS:

- This alley is included in the urban agriculture design focus.
- The surface of the alley is asphalt.
- Visibility within the alley is high.
- The alley is suitable to a mix of stormwater BMPs with a greater infiltration potential on the south-east end where sheet flow from the adjacent street could be diverted into alley located BMPs.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	18980
Commercial property (cuft)	0
Industrial property (cuft)	0
Total runoff (cuft)	18980

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	11721
Pervious runoff (cuft)	985

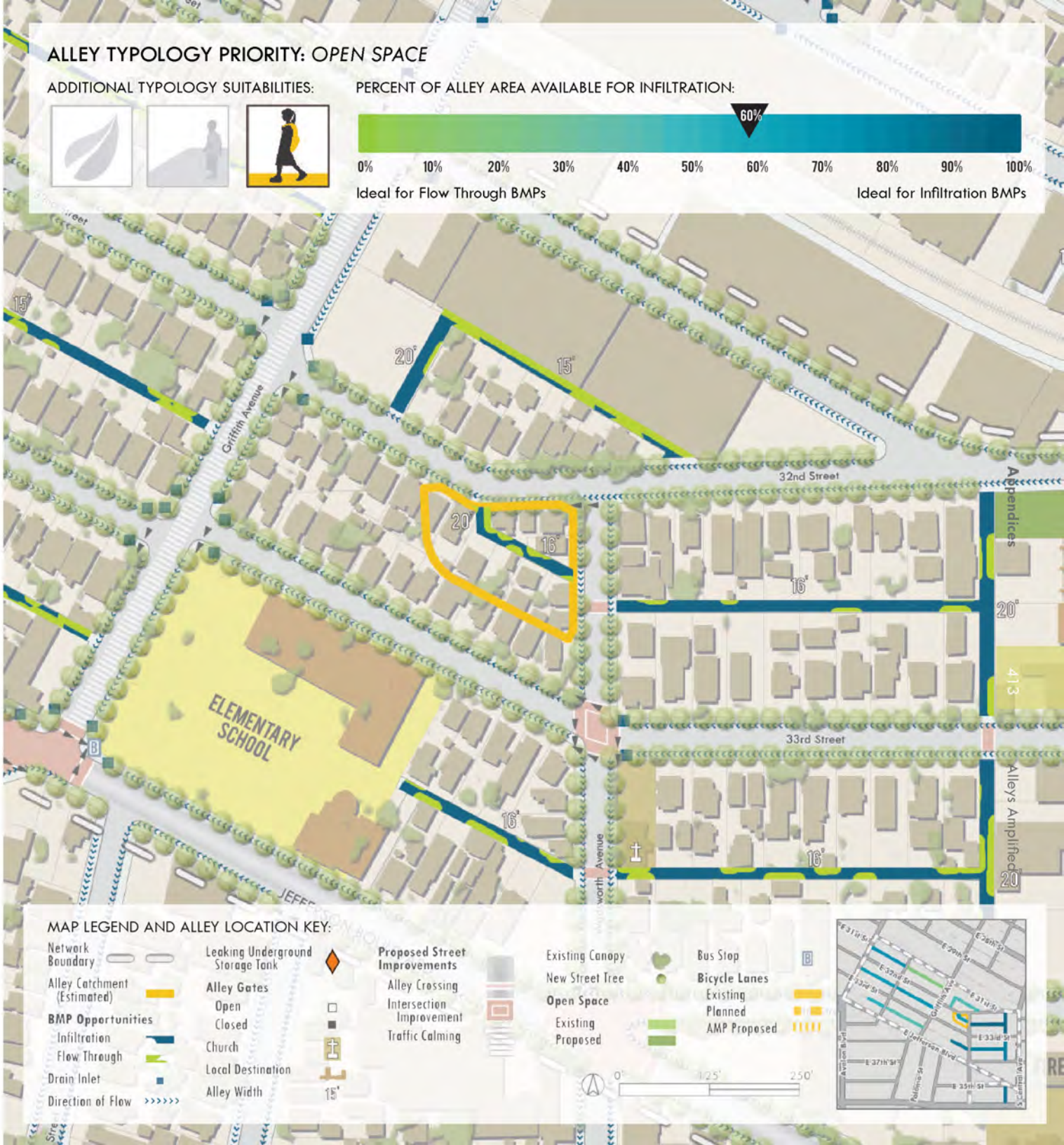
Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	2880
Building Setback (sqft)	1140
Estimated Catchment (sqft)	28161

FIGURE E.89
DETAILED MAP FOR QUINCY JONES NETWORK ALLEY #8





QUINCY JONES NETWORK ALLEY #9

DESIGN CONSIDERATIONS:

- The north-south running portion should become new open space while the east west running portion is included in the urban agriculture design.
- The surface of the alley is asphalt.
- Visibility is high at the north-south running segment and moderate at the east-west running segment.
- Suitable for infiltration BMPs and sheet flow from adjacent street could be diverted into alley located BMPs at all ends. Potential new open space in an adjacent vacant lot could be a location for further infiltration.
- The north-south section is CPIO designated TOD High Density Neighborhood Serving Corridor.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	62800
Commercial property (cuft)	27100
Industrial property (cuft)	0
Total runoff (cuft)	89900

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	56550
Pervious runoff (cuft)	3426

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	14275
Building Setback (sqft)	2309
Estimated Catchment (sqft)	119091

FIGURE E.90
DETAILED MAP FOR QUINCY JONES NETWORK ALLEY #9

QUINCY JONES NETWORK ALLEY #10

DESIGN CONSIDERATIONS:

- This alley is part of the urban agriculture design. Design efforts should work with the adjacent school.
- The surface of the alley is asphalt.
- Visibility within the alley is moderate to high.
- The alley is suitable for a mix of BMPs through there is the potential for infiltration at the south-east end where sheet flow from the adjacent street could be diverted into alley BMPs.
- CPIO designated Hybrid Limited.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	34500
Commercial property (cuft)	11860
Industrial property (cuft)	0
Total runoff (cuft)	46360

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	29104
Pervious runoff (cuft)	1835

Soils Information:

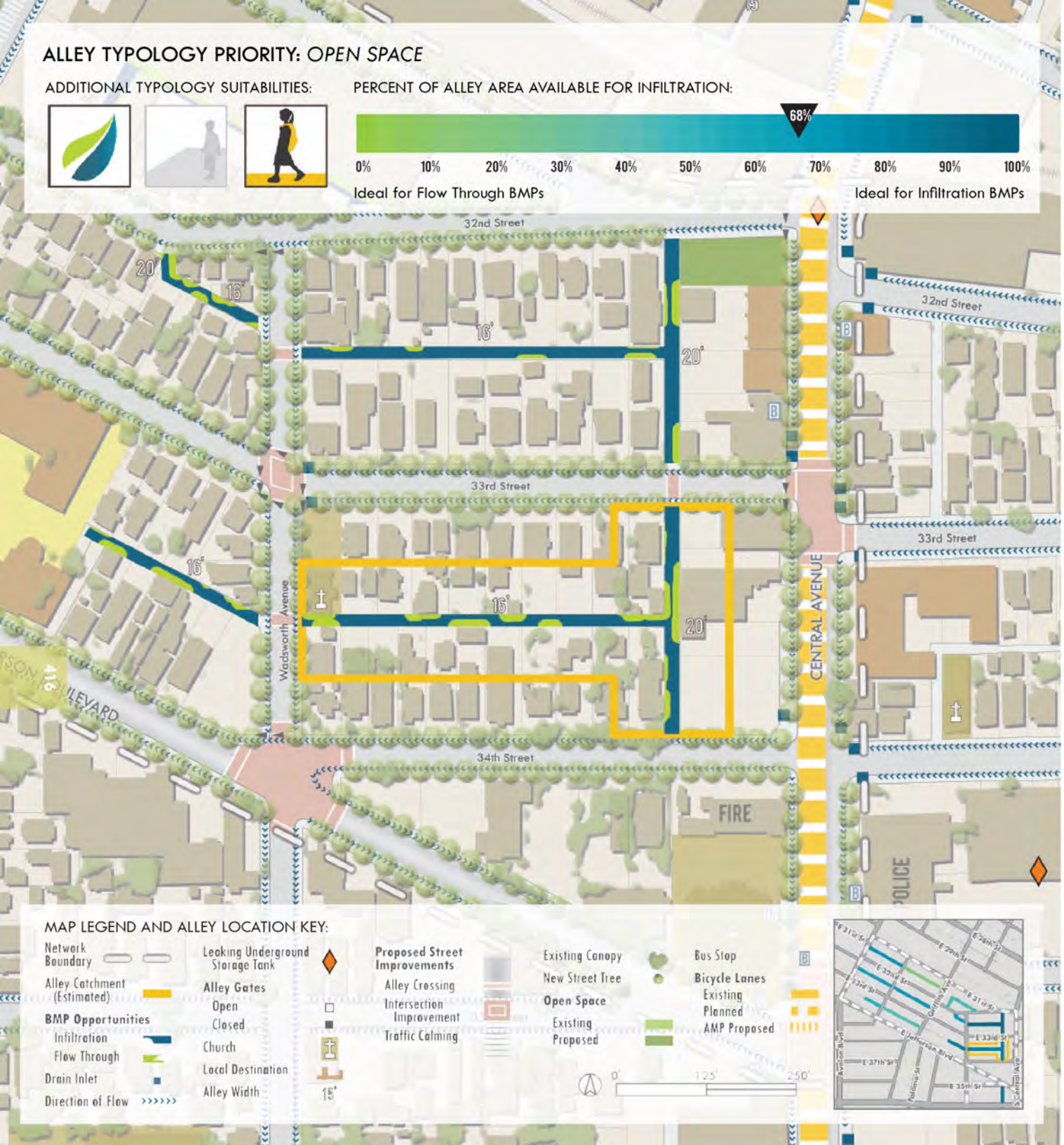
Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	4283
Building Setback (sqft)	1298
Estimated Catchment (sqft)	62585

FIGURE E.91
DETAILED MAP FOR QUINCY JONES NETWORK ALLEY #10





QUINCY JONES NETWORK ALLEY #11

DESIGN CONSIDERATIONS:

- The north-south running portion should become new open space while the east-west running portion is included in the urban agriculture design.
- The alley is suitable for a mix of BMPs and sheet flow from the adjacent street could be diverted into alley located infiltration BMPs at the north and south ends.
- The surface of the alley is concrete.
- Visibility is high at the north-south running segment and moderate at the east-west running segment.
- The north-south section is CPIO designated TOD High Density Neighborhood Serving Corridor.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	63850
Commercial property (cuft)	26180
Industrial property (cuft)	0
Total runoff (cuft)	90030

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	56585
Pervious runoff (cuft)	3492

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	14360
Building Setback (sqft)	4627
Estimated Catchment (sqft)	119745

FIGURE E.92
DETAILED MAP FOR QUINCY JONES NETWORK ALLEY #11

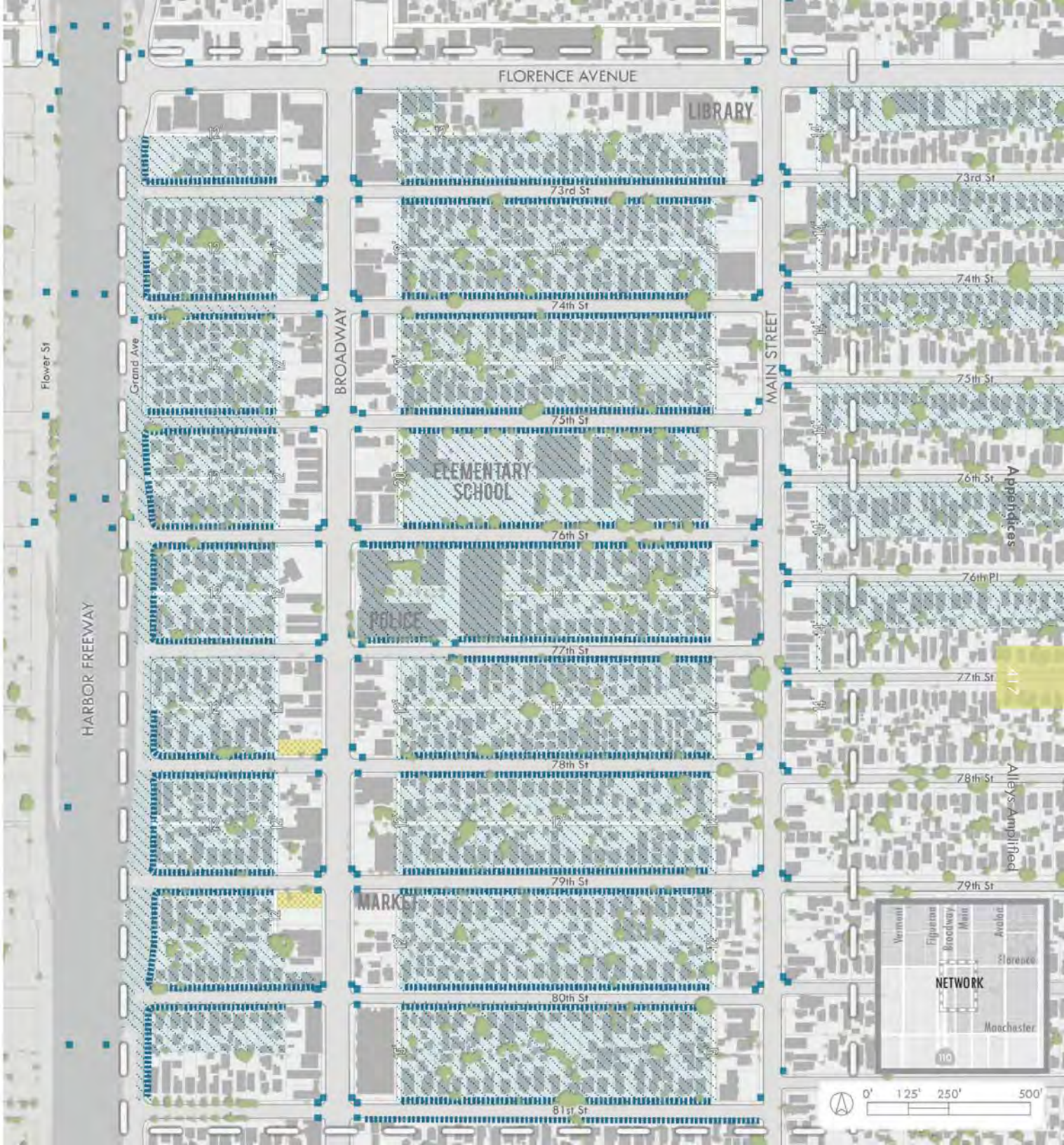


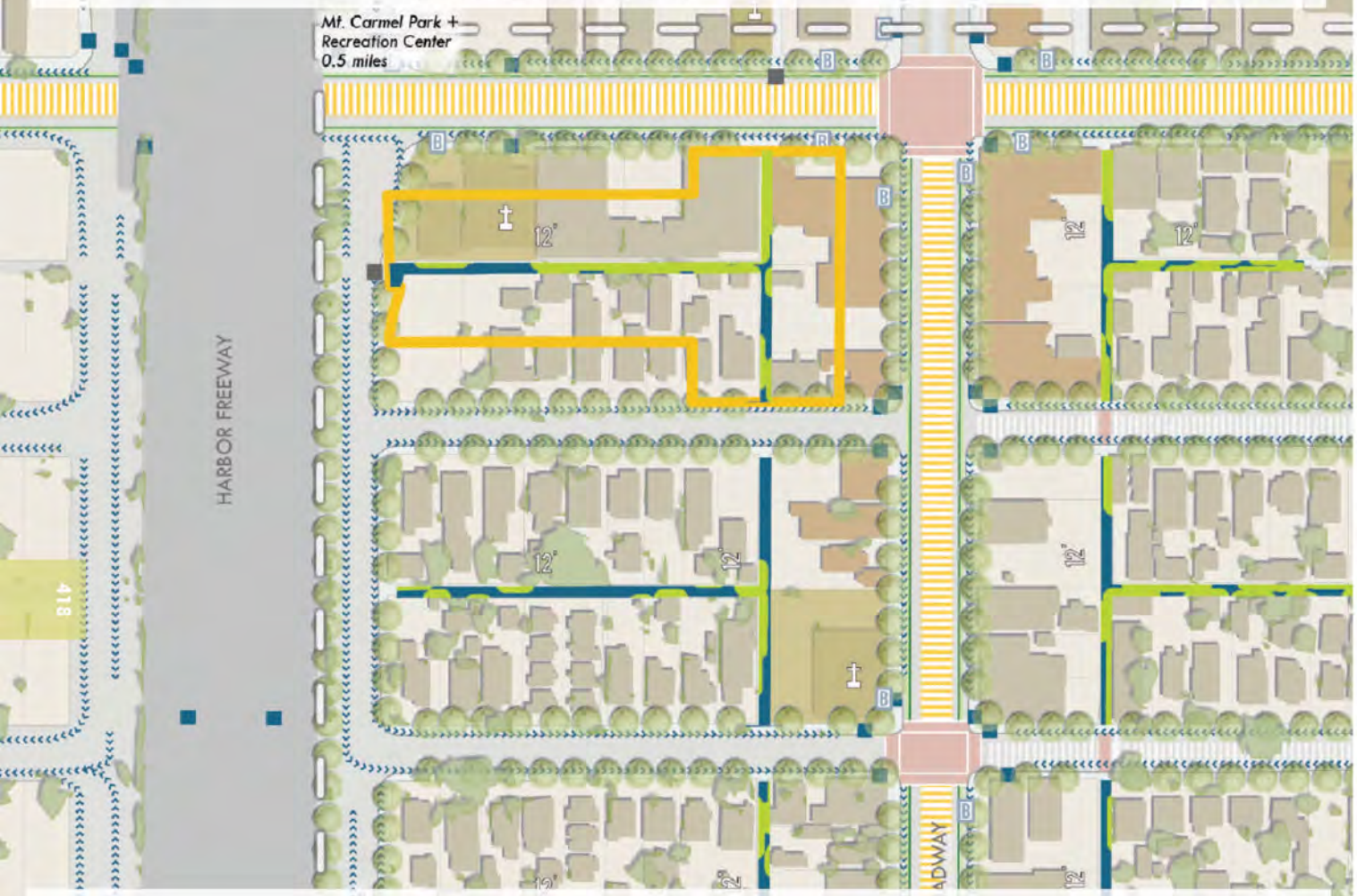
FIGURE E.93
POTENTIAL LID BMP LOCATIONS IN THE BROADWAY-75TH NETWORK

ALLEY TYPOLOGY PRIORITY: *OPEN SPACE*

ADDITIONAL TYPOLOGY SUITABILITIES:

PERCENT OF ALLEY AREA AVAILABLE FOR INFILTRATION:





MAP LEGEND AND ALLEY LOCATION KEY:

Network Boundary
Alley Catchment (Estimated)
BMP Opportunities
Infiltration
Flow Through
Drain Inlet
Direction of Flow
Leaking Underground Storage Tank
Alley Gates
Open
Closed
Church
Local Destination
Alley Width
Proposed Street Improvements
Alley Crossing
Intersection Improvement
Traffic Calming
Existing Canopy
New Street Tree
Open Space
Existing
Proposed
Bus Stop
Bicycle Lanes
Existing
Planned
AMP Proposed



BROADWAY-75TH NETWORK ALLEY #1

DESIGN CONSIDERATIONS:

- The north-south segment should prioritize pedestrian improvements with urban cooling design features while the east-west segment should address open space. Consult the adjacent church on projects.
- Visibility is high in the north-south running segment and moderate in the east-west segment. The north-south segment is concrete and the east-west segment is overgrown.
- This alley is suited to a mix of BMPs.
- CPIO designated Commercial-Only Corridor.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	20010
Commercial property (cuft)	53960
Industrial property (cuft)	0
Total runoff (cuft)	73970

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	50783
Pervious runoff (cuft)	1145

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	8314
Building Setback (sqft)	5378
Estimated Catchment (sqft)	96265

FIGURE E.94
DETAILED MAP FOR BROADWAY-75TH NETWORK ALLEY #1

BROADWAY-75TH NETWORK ALLEY #2

DESIGN CONSIDERATIONS:

- The north-south segment of this alley is included in the fitness loop design while the east-west segment should prioritize pedestrian improvements with urban cooling strategies. Redesign efforts should consult the nearby church.
- Visibility within the alley is high in the north-south running segment and low in the east-west segment.
- The north-south segment is asphalt and the east-west segment is concrete.
- This alley is suited to flow through BMPs.
- CPIO designated Commercial-Only Corridor.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	11270
Commercial property (cuft)	37150
Industrial property (cuft)	0
Total runoff (cuft)	48420

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	33340
Pervious runoff (cuft)	1145

Soils Information:

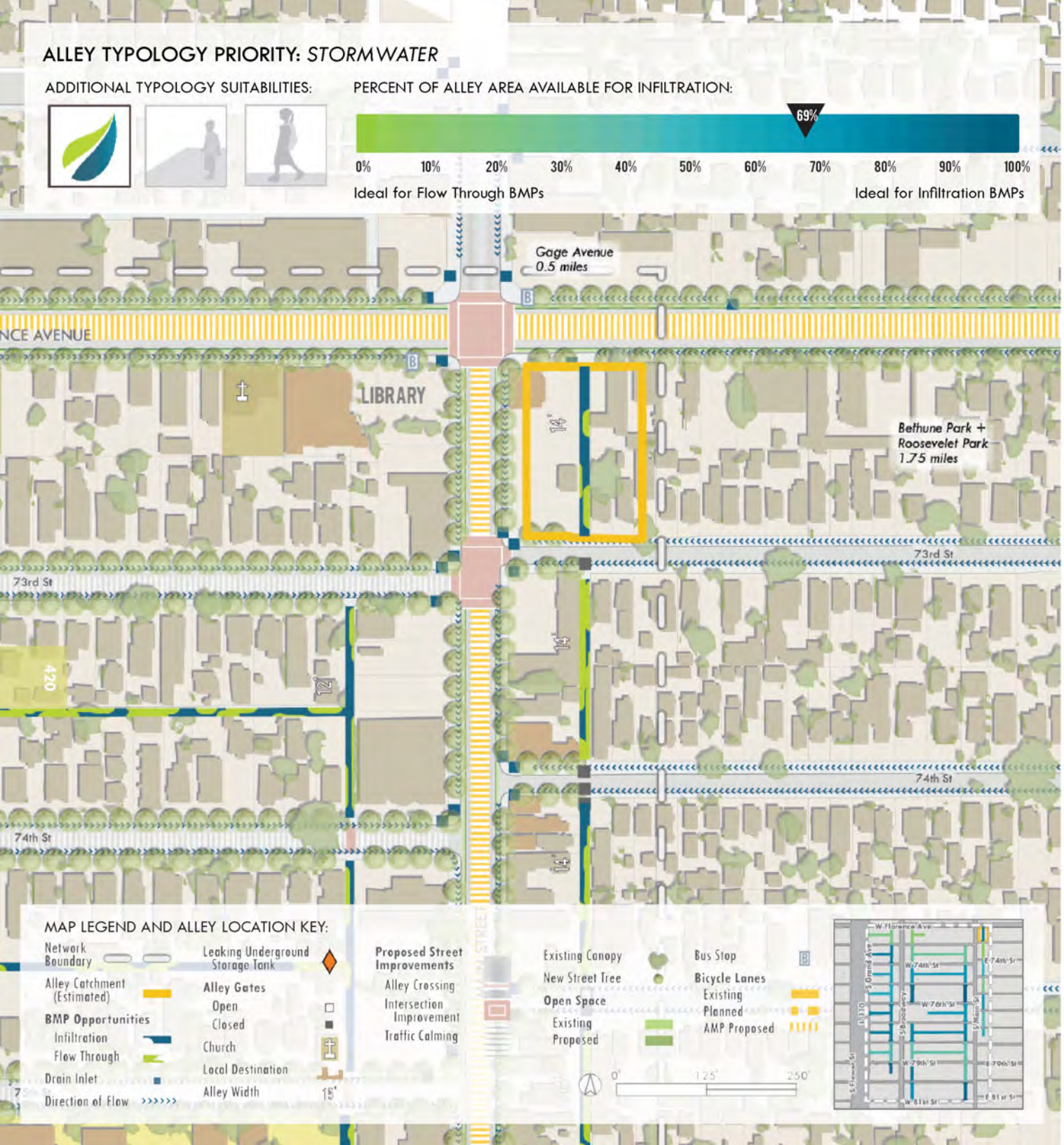
Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	5769
Building Setback (sqft)	4284
Estimated Catchment (sqft)	61940



FIGURE E.95
DETAILED MAP FOR BROADWAY-75TH NETWORK ALLEY #2



BROADWAY-75TH NETWORK ALLEY #3

DESIGN CONSIDERATIONS:

- This alley is part of the stormwater demonstration loop design.
- Visibility within the alley is high.
- The alley surface is asphalt.
- This alley is suitable for infiltration BMPs. In addition, sheet flow from adjacent streets could be directed into alley BMPs.
- CPIO designated Commercial-Only Corridor.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	43050
Commercial property (cuft)	20650
Industrial property (cuft)	0
Total runoff (cuft)	63700

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	42710
Pervious runoff (cuft)	2125

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	8236
Building Setback (sqft)	2625
Estimated Catchment (sqft)	99008

FIGURE E.96
DETAILED MAP FOR BROADWAY-75TH NETWORK ALLEY #3

BROADWAY-75TH NETWORK ALLEY #4

DESIGN CONSIDERATIONS:

- The north-south segment of this alley is part of the stormwater demonstration loop design and the east west should prioritize pedestrian improvements with urban cooling features. Redesign efforts should consult the nearby church.
- Visibility within the alley is high in the north-south running segment and moderate in the east-west segment.
- Both alley segments are asphalt.
- This alley is suitable for infiltration BMPs, sheet flow from adjacent streets could be directed into alley BMPs.
- The north-south segment is CPIO designated TOD High Density Neighborhood Serving Corridor.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	4890
Commercial property (cuft)	26650
Industrial property (cuft)	0
Total runoff (cuft)	31440

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	21742
Pervious runoff (cuft)	316

Soils Information:

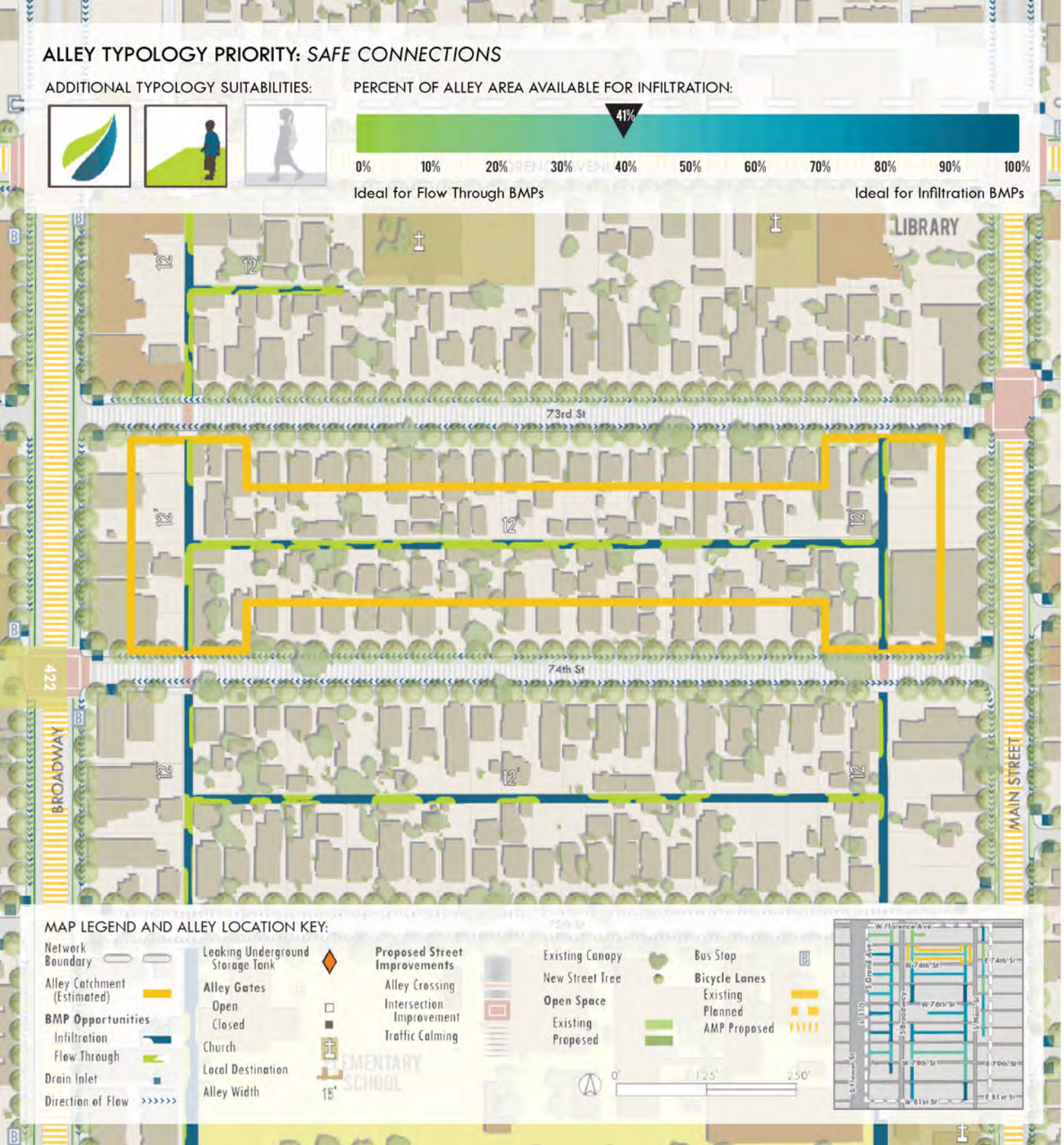
Soil name	Chino Silt Loam
KSAT rate (in/hr)	0.81
Field capacity (in/ft)	3.42

Dimensions:

Alley (sqft)	3293
Building Setback (sqft)	1033
Estimated Catchment (sqft)	38749

FIGURE E.97
DETAILED MAP FOR BROADWAY-75TH NETWORK ALLEY #4





BROADWAY-75TH NETWORK ALLEY #5

DESIGN CONSIDERATIONS:

- The north-south segments of this alley are included in the fitness loop design, the east-west segment should prioritize open space design, be decommissioned or used as communal.
- Visibility within the alley is high in the north-south running segments and low in the east-west segment.
- North-south segments are asphalt while the east-west segment is overgrown.
- Alley is suitable for a mix of stormwater BMPs, sheet flow from adjacent streets could be directed into alley BMPs.
- The north-south segments are CPIO designated TOD High Density Neighborhood Serving Corridor.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	99380
Commercial property (cuft)	42030
Industrial property (cuft)	0
Total runoff (cuft)	141410

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	94989
Pervious runoff (cuft)	4542

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	18420
Building Setback (sqft)	10826
Estimated Catchment (sqft)	223038

FIGURE E.98
DETAILED MAP FOR BROADWAY-75TH NETWORK ALLEY #5

BROADWAY-75TH NETWORK ALLEY #6

DESIGN CONSIDERATIONS:

- This alley is part of the stormwater demonstration loop design. However, it will be necessary to work with community members to determine potential gate removal as the alley is closed at both ends.
- Visibility within the alley is high.
- The alley surface is asphalt.
- This alley is more suited to flow through BMPs.
- One alley adjacent building is appropriate for a green wall.
- CPIO designated TOD High Density Neighborhood Serving Corridor.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	11630
Commercial property (cuft)	18530
Industrial property (cuft)	0
Total runoff (cuft)	30160

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	20626
Pervious runoff (cuft)	563

Soils Information:

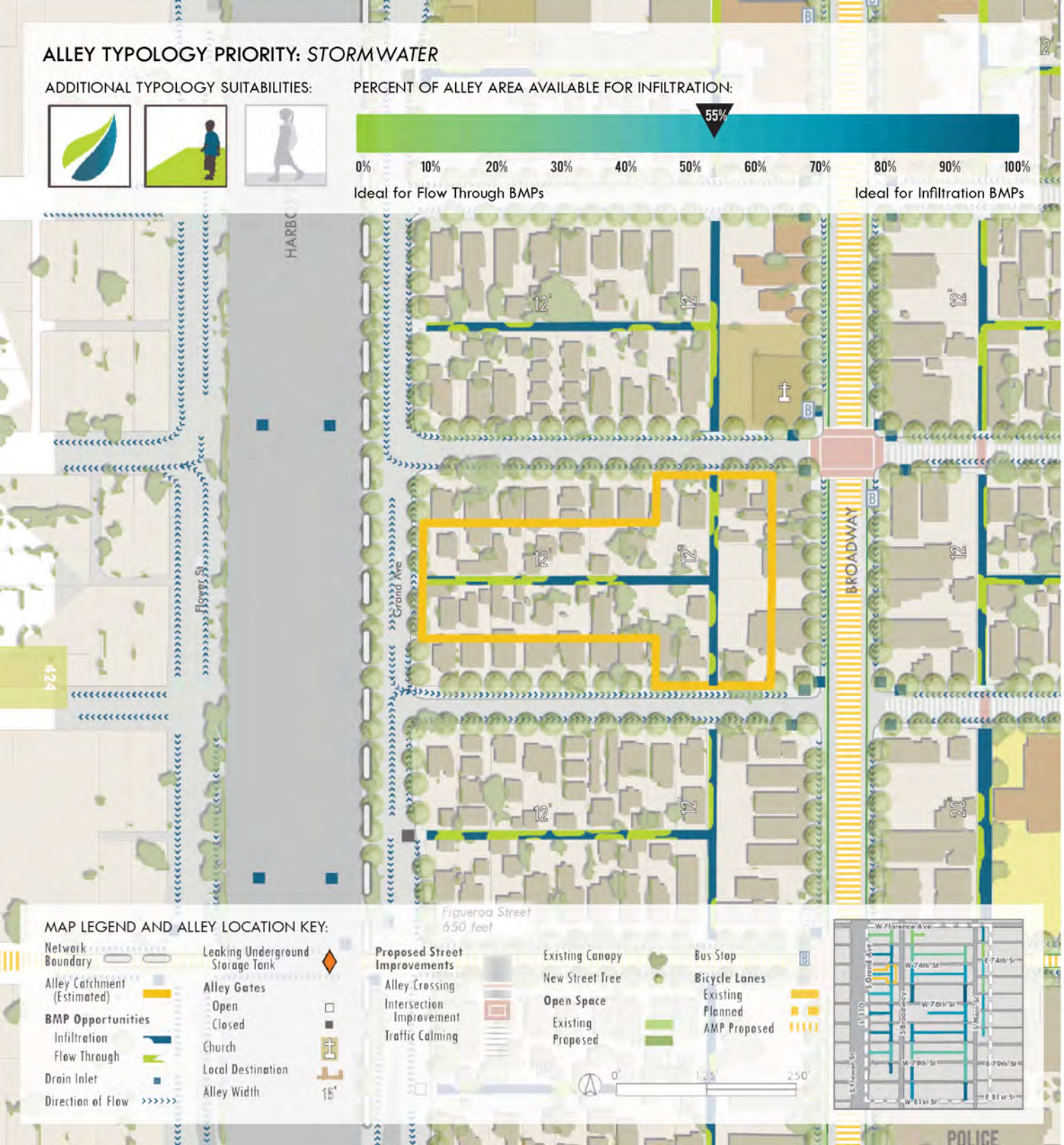
Soil name	Chino Silt Loam
KSAT rate (in/hr)	0.81
Field capacity (in/ft)	3.42

Dimensions:

Alley (sqft)	3494
Building Setback (sqft)	2890
Estimated Catchment (sqft)	41567

FIGURE E.99
DETAILED MAP FOR BROADWAY-75TH NETWORK ALLEY #6





BROADWAY-75TH NETWORK ALLEY #7

- The north-south segment of this alley is part of the stormwater demonstration loop design and the east west should prioritize pedestrian improvements with urban cooling features.
- Visibility within the alley is high in the north-south running segment and moderate in the east-west segment.
- The north-south segment of the alley is asphalt while the east-west segment is a combination of asphalt/overgrown.
- This alley is suitable for infiltration BMPs. Street sheet flow could be directed into alley BMPs.
- The north-south segment is CPIO designated TOD High Density Neighborhood Serving Corridor.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	42630
Commercial property (cuft)	20730
Industrial property (cuft)	0
Total runoff (cuft)	63360

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	42547
Pervious runoff (cuft)	2044

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	8198
Building Setback (sqft)	3710
Estimated Catchment (sqft)	98516

FIGURE E.100
DETAILED MAP FOR BROADWAY-75TH NETWORK ALLEY #7

BROADWAY-75TH NETWORK ALLEY #8

- The north-south segments of this alley are included in the fitness loop design. The east-west segment should prioritize open space design, be decommissioned, used as a communal space.
- Visibility within the alley is high in the north-south running segments and low in the east-west segment.
- The north-south segments are asphalt, the east-west segment is overgrown.
- This alley suitable for a mix of stormwater BMPs. Street sheet flow could be directed into alley BMPs.
- The north-south segments are CPIO designated TOD High Density Neighborhood Serving Corridor.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	99180
Commercial property (cuft)	41430
Industrial property (cuft)	0
Total runoff (cuft)	140610

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	94415
Pervious runoff (cuft)	4553

Soils Information:

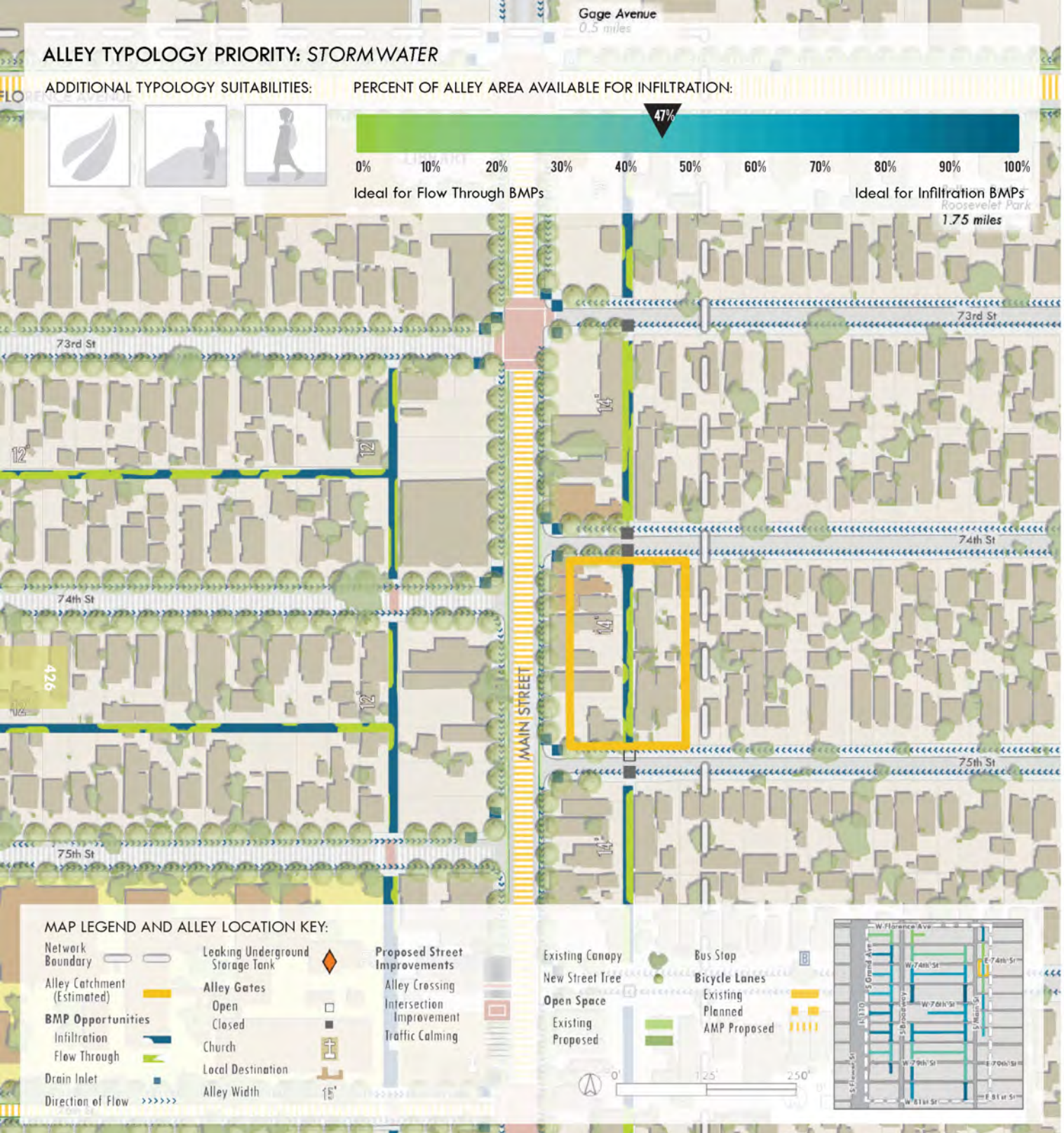
Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	18420
Building Setback (sqft)	7390
Estimated Catchment (sqft)	221944



FIGURE E.101
DETAILED MAP FOR BROADWAY-75TH NETWORK ALLEY #8



BROADWAY-75TH NETWORK ALLEY #9

DESIGN CONSIDERATIONS:

- This alley is part of the stormwater demonstration loop design. However, it will be necessary to work with community members to determine potential gate removal as the alley is closed at north end.
- Visibility within the alley is high.
- The alley surface is asphalt.
- This alley is more suited to a mix of stormwater BMPs. In addition, sheet flow from adjacent streets could be directed into an infiltration BMP at the north end of the alley.
- CPIO designated TOD High Density Neighborhood Serving Corridor.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	11870
Commercial property (cuft)	17710
Industrial property (cuft)	0
Total runoff (cuft)	29580

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	20212
Pervious runoff (cuft)	571

Soils Information:

Soil name	Chino Silt Loam
KSAT rate (in/hr)	0.81
Field capacity (in/ft)	3.42

Dimensions:

Alley (sqft)	3456
Building Setback (sqft)	1818
Estimated Catchment (sqft)	41057

FIGURE E.102
DETAILED MAP FOR BROADWAY-75TH NETWORK ALLEY #9

BROADWAY-75TH NETWORK
ALLEY #10

DESIGN CONSIDERATIONS:

- This alley is part of the stormwater demonstration loop design. The east-west portion should prioritize open space. It will be necessary to work with community members to determine potential gate removal at the west end.
- Visibility is high in the north-south running segment and moderate in the east-west segment.
- The north-south alley surface is concrete and east-west surface is asphalt.
- More suited to a mix of stormwater BMPs. Sheet flow from adjacent streets could be directed into an infiltration BMP at the north end.
- The north-south segment is CPIO designated TOD High Density Neighborhood Serving Corridor.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	41390
Commercial property (cuft)	21450
Industrial property (cuft)	0
Total runoff (cuft)	62840

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	42247
Pervious runoff (cuft)	1973

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	8283
Building Setback (sqft)	3985
Estimated Catchment (sqft)	97189

FIGURE E.103
DETAILED MAP FOR BROADWAY-75TH NETWORK ALLEY #10





BROADWAY-75TH NETWORK ALLEY #11

DESIGN CONSIDERATIONS:

- This alley is included in the fitness loop design yet the 20' width of the alley allows for both stormwater infiltration and vehicular movement.
- Visibility within the alley is high.
- The alley surface is asphalt.
- This alley is suitable for infiltration BMPs. In addition, sheet flow from adjacent streets could be directed into alley BMPs.
- Design efforts should engage adjacent elementary school and alley renovations could be completed as part of a larger school yard greening project.
- CPIO designated TOD High Density Neighborhood Serving Corridor.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	0
Commercial property (cuft)	38390
Industrial property (cuft)	0
Total runoff (cuft)	38390

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	26510
Pervious runoff (cuft)	416

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	5876
Building Setback (sqft)	1359
Estimated Catchment (sqft)	46587

FIGURE E.104
DETAILED MAP FOR BROADWAY-75TH NETWORK ALLEY #11

BROADWAY-75TH NETWORK
ALLEY #12

DESIGN CONSIDERATIONS:

- This alley is included in the fitness loop design yet the 20' width of the alley allows for both stormwater infiltration and vehicular movement.
- Visibility within this alley is high.
- The alley surface is asphalt.
- This alley is suitable for infiltration BMPs. In addition, sheet flow from adjacent streets could be directed into alley BMPs.
- Design efforts should engage adjacent elementary school and alley renovations could be completed as part of a larger school yard greening project.
- CPIO designated TOD High Density Neighborhood Serving Corridor.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	0
Commercial property (cuft)	38400
Industrial property (cuft)	0
Total runoff (cuft)	38400

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	26527
Pervious runoff (cuft)	411

Soils Information:

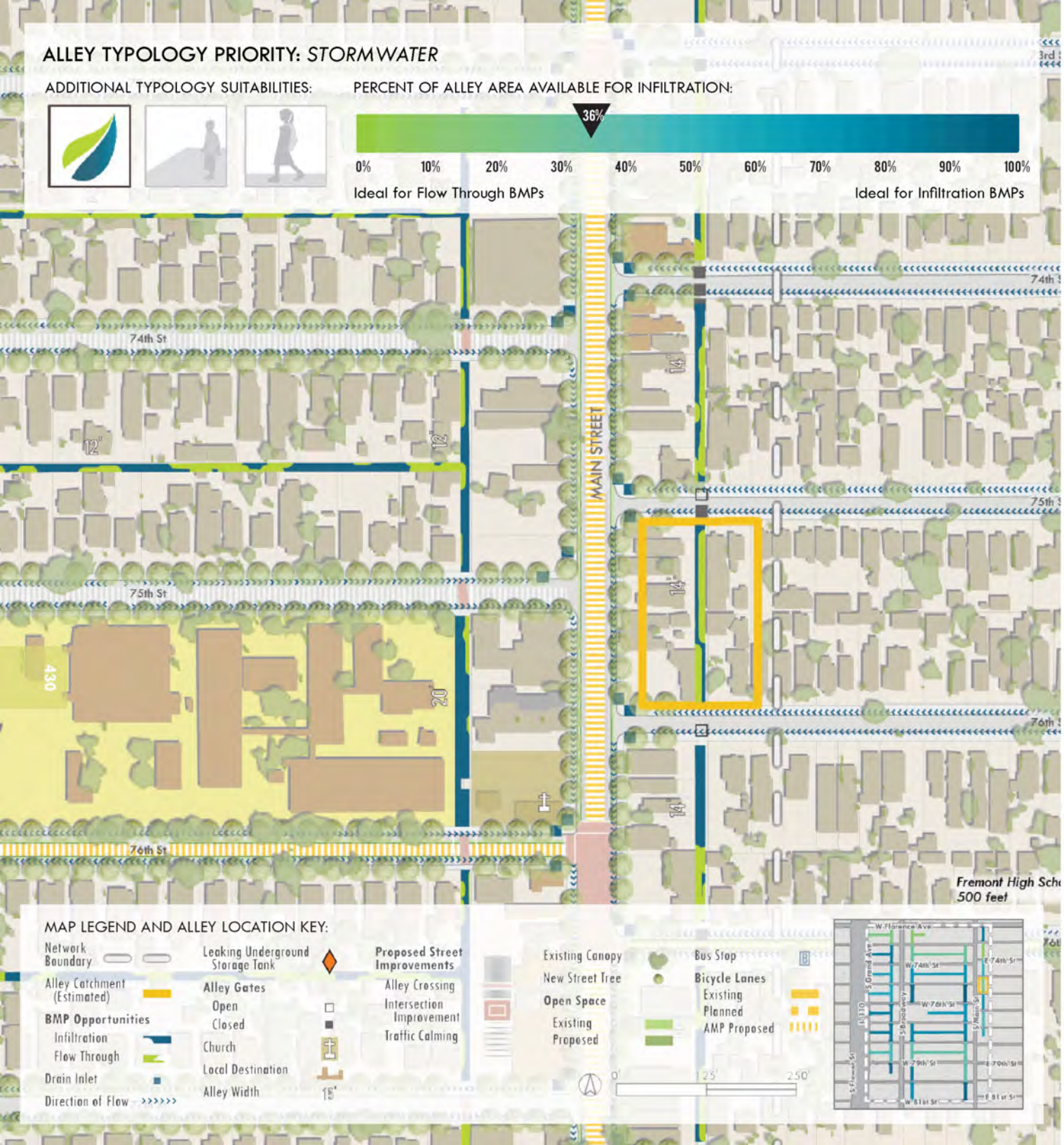
Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	5677
Building Setback (sqft)	596
Estimated Catchment (sqft)	46771

FIGURE E.105
DETAILED MAP FOR BROADWAY-75TH NETWORK ALLEY #12





BROADWAY-75TH NETWORK ALLEY #13

DESIGN CONSIDERATIONS:

- This alley is part of the stormwater demonstration loop design. It will be necessary to work with community members to determine potential gate removal as the alley is closed at the north end.
- Visibility within the alley is high.
- The alley surface is asphalt.
- More suited to flow through BMPs.
- One alley adjacent building is appropriate for a green wall.
- Asphalt to the west of the alley may increase radiant heat and should be addressed in the design.
- CPIO designated TOD High Density Neighborhood Serving Corridor.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	11770
Commercial property (cuft)	17660
Industrial property (cuft)	0
Total runoff (cuft)	29430

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	20110
Pervious runoff (cuft)	566

Soils Information:

Soil name	Chino Silt Loam
KSAT rate (in/hr)	0.81
Field capacity (in/ft)	3.42

Dimensions:

Alley (sqft)	3430
Building Setback (sqft)	2209
Estimated Catchment (sqft)	40824

FIGURE E.106
DETAILED MAP FOR BROADWAY-75TH NETWORK ALLEY #13

BROADWAY-75TH NETWORK ALLEY #14

DESIGN CONSIDERATIONS:

- The north-south segment is part of the stormwater demonstration loop design and the east-west should prioritize pedestrian improvements with urban cooling features.
- Visibility is high in the north-south running segments and moderate in the east-west segment.
- Both alley segments are concrete.
- This alley is more suited to infiltration BMPs. Sheet flow from adjacent streets could be directed into an infiltration BMP at the north end of the alley.
- The north-south segment is CPIO designated TOD High Density Neighborhood Serving Corridor.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	50260
Commercial property (cuft)	10090
Industrial property (cuft)	0
Total runoff (cuft)	60350

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	40505
Pervious runoff (cuft)	1977

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	8089
Building Setback (sqft)	2602
Estimated Catchment (sqft)	94663

FIGURE E.107
DETAILED MAP FOR BROADWAY-75TH NETWORK ALLEY #14





BROADWAY-75TH NETWORK ALLEY #15

DESIGN CONSIDERATIONS:

- The north-south portion is included in the fitness loop design while the east-west portion should prioritize pedestrian improvements with urban cooling features.
- Visibility is good in the north-south segment. However, the dead end at the west side of the alley could create a sense of entrapment.
- The alley surface is concrete.
- This alley is suited to a mix of stormwater BMPs. Sheet flow from adjacent streets could be directed into infiltration BMPs in the alley.
- The north-south segment is CPIO designated TOD High Density Neighborhood Serving Corridor.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	64800
Commercial property (cuft)	20210
Industrial property (cuft)	0
Total runoff (cuft)	85010

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	56867
Pervious runoff (cuft)	3000

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	11646
Building Setback (sqft)	4730
Estimated Catchment (sqft)	137135

FIGURE E.108
DETAILED MAP FOR BROADWAY-75TH NETWORK ALLEY #15

BROADWAY-75TH NETWORK
ALLEY #16

DESIGN CONSIDERATIONS:

- This alley is part of the stormwater demonstration loop design. However, it will be necessary to work with community members to determine potential gate removal as the alley is closed at the south end.
- Visibility within the alley is high.
- The alley surface is asphalt.
- This alley is more suited to a mix of stormwater BMPs. In addition, sheet flow from adjacent streets could be directed into an infiltration BMP at the north end of the alley.
- CPIO designated TOD High Density Neighborhood Serving Corridor.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	11620
Commercial property (cuft)	17860
Industrial property (cuft)	0
Total runoff (cuft)	29480

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	20152
Pervious runoff (cuft)	560

Soils Information:

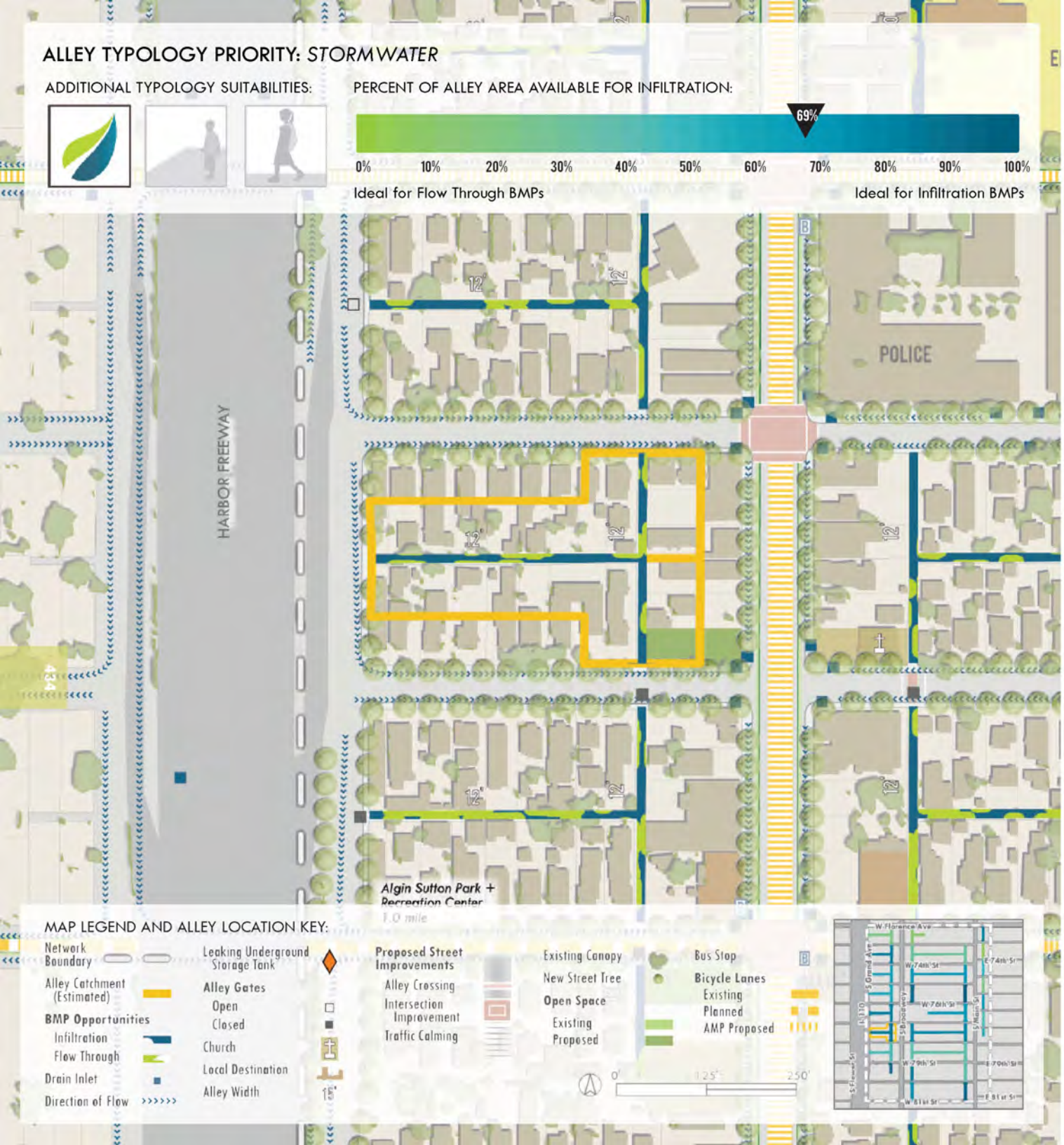
Soil name	Chino Silt Loam
KSAT rate (in/hr)	0.81
Field capacity (in/ft)	3.42

Dimensions:

Alley (sqft)	3431
Building Setback (sqft)	1375
Estimated Catchment (sqft)	40788



FIGURE E.109
DETAILED MAP FOR BROADWAY-75TH NETWORK ALLEY #16



BROADWAY-75TH ALLEY #17

DESIGN CONSIDERATIONS:

- This alley is part of the stormwater demonstration loop design.
- Visibility within the alley is high in the north-south running segment and moderate in the east-west segment.
- The north-south alley surface is concrete while the east-west surface is asphalt.
- This alley is more suited to infiltration BMPs. In addition, sheet flow from adjacent streets could be directed into an infiltration BMP at the north end of the alley.
- The north-south segment is CPIO designated TOD High Density Neighborhood Serving Corridor.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	52480
Commercial property (cuft)	7440
Industrial property (cuft)	0
Total runoff (cuft)	59920

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	40158
Pervious runoff (cuft)	2023

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	7912
Building Setback (sqft)	2426
Estimated Catchment (sqft)	94148

FIGURE E.110
DETAILED MAP FOR BROADWAY-75TH NETWORK ALLEY #17

BROADWAY-75TH ALLEY #18

DESIGN CONSIDERATIONS:

- The north-south segments of this alley are included in the fitness loop design. The east-west segment should prioritize pedestrian improvements with urban cooling features.
- Visibility within the alley is high in the north-south running segments and low in the east-west segment.
- All alley surfaces are concrete.
- This alley is primarily suited to infiltration BMPs. However, the upper portion of the eastern north-south running segment cannot infiltration BMPs.
- The north-south segments are CPIO designated TOD High Density Neighborhood Serving Corridor.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	111840
Commercial property (cuft)	27470
Industrial property (cuft)	0
Total runoff (cuft)	139310

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	
Pervious runoff (cuft)	93239
	4848

Soils Information:

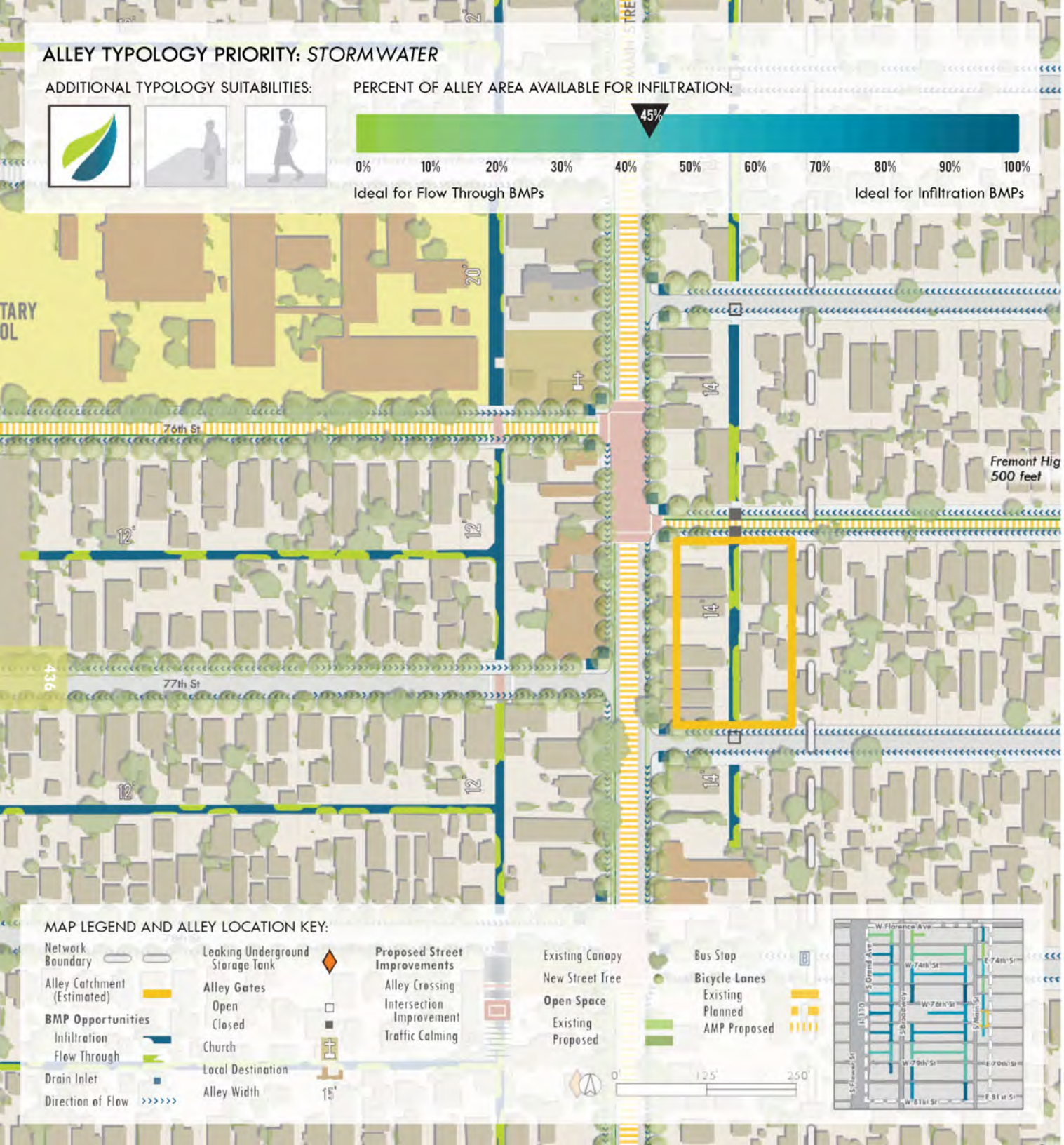
Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	18560
Building Setback (sqft)	6495
Estimated Catchment (sqft)	222429

FIGURE E.111
DETAILED MAP FOR BROADWAY-75TH NETWORK ALLEY #18





BROADWAY-75TH NETWORK ALLEY #19

DESIGN CONSIDERATIONS:

- This alley is part of the stormwater demonstration loop design. However, it will be necessary to work with community members to determine potential gate removal as the alley is closed at the north end.
- Visibility within the alley is high.
- The alley surface is asphalt.
- This alley is more suited to a mix of stormwater BMPs.
- CPIO designated TOD High Density Neighborhood Serving Corridor.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	11500
Commercial property (cuft)	18100
Industrial property (cuft)	0
Total runoff (cuft)	29600

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	20221
Pervious runoff (cuft)	568

Soils Information:

Soil name	Chino Silt Loam
KSAT rate (in/hr)	0.81
Field capacity (in/ft)	3.42

Dimensions:

Alley (sqft)	3430
Building Setback (sqft)	1883
Estimated Catchment (sqft)	40802

FIGURE E.112
DETAILED MAP FOR BROADWAY-75TH NETWORK ALLEY #19

BROADWAY-75TH NETWORK ALLEY #20

DESIGN CONSIDERATIONS:

- This alley is one of two proposed parklets in the network.
- Visibility is characterized as moderate because it dead ends to the south. Otherwise sight lines are open.
- The alley surface is asphalt.
- This alley is more suited to a mix of stormwater BMPs. In addition, sheet flow from the adjacent street could be directed into an infiltration BMP at the north end of the alley.
- CPIO designated TOD High Density Neighborhood Serving Corridor.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	5220
Commercial property (cuft)	8420
Industrial property (cuft)	0
Total runoff (cuft)	13640

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	9322
Pervious runoff (cuft)	259

Soils Information:

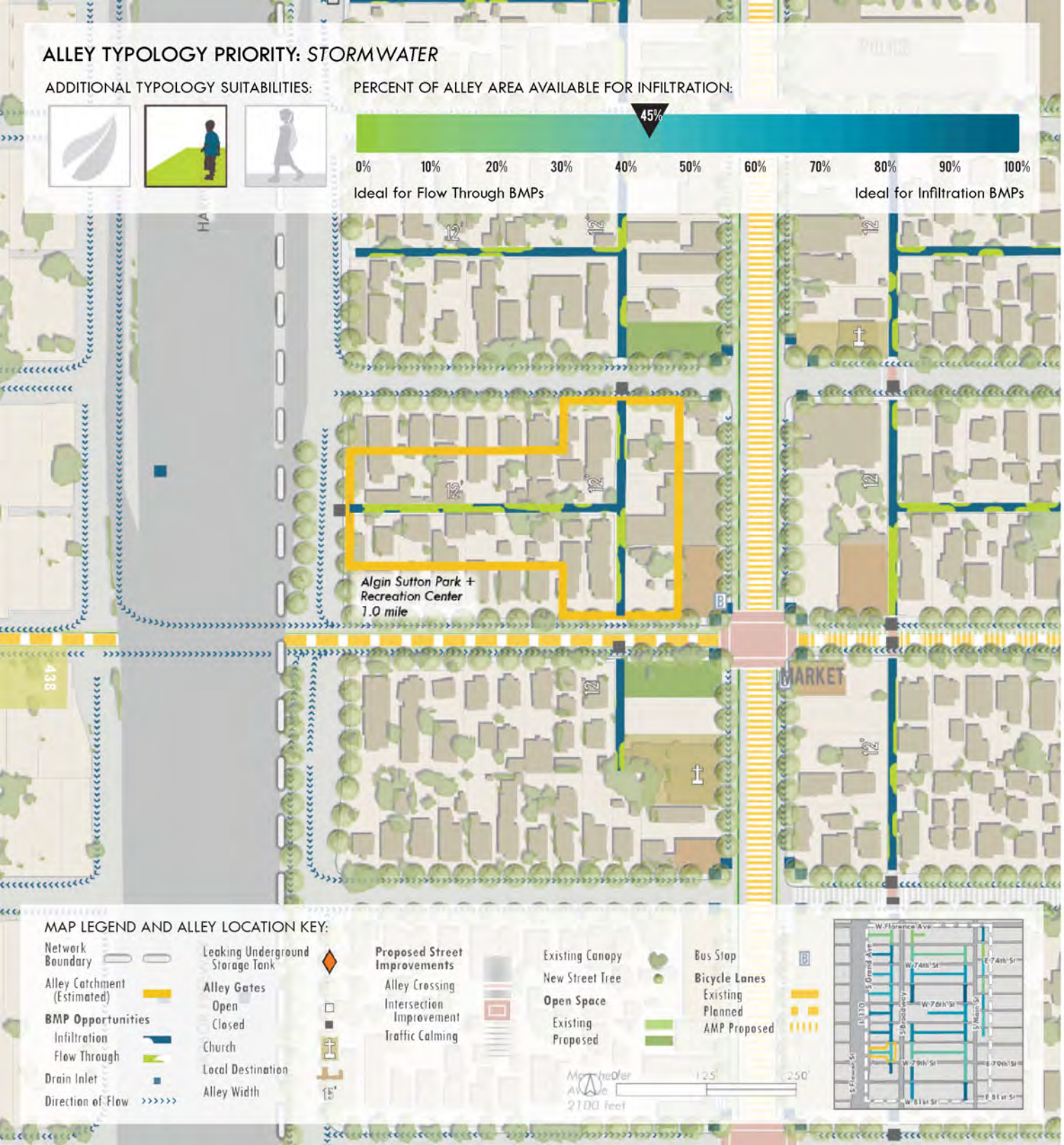
Soil name	Chino Silt Loam
KSAT rate (in/hr)	0.81
Field capacity (in/ft)	3.42

Dimensions:

Alley (sqft)	1609
Building Setback (sqft)	768
Estimated Catchment (sqft)	18752

FIGURE E.113
DETAILED MAP FOR BROADWAY-75TH NETWORK ALLEY #20





BROADWAY-75TH NETWORK ALLEY #21

DESIGN CONSIDERATIONS:

- Part of the stormwater demonstration loop design. It will be necessary to work with community members to determine potential gate removal (closed at north and west ends). There is the potential to decommission the east-west portion.
- Visibility is high at north-south running segment and moderate at east-west running segment.
- The alley surface is overgrown.
- This alley is more suited to a mix of stormwater BMPs. Sheet flow from adjacent streets could be directed into infiltration BMPs.
- The north-south segment is CPIO designated TOD High Density Neighborhood Serving Corridor.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	39930
Commercial property (cuft)	22110
Industrial property (cuft)	0
Total runoff (cuft)	62040

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	41628
Pervious runoff (cuft)	2035

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	8092
Building Setback (sqft)	4444
Estimated Catchment (sqft)	95055

FIGURE E.114
DETAILED MAP FOR BROADWAY-75TH NETWORK ALLEY #21

BROADWAY-75TH NETWORK
ALLEY #22

DESIGN CONSIDERATIONS:

- The north-south segments are included in the fitness loop design. The east-west segment should prioritize open space design or be decommissioned or used as a communal space adjacent residents.
- It will be necessary to work with community members to determine potential gate removal (closed at northern and south-western ends).
- Visibility within the alley is high at north-south running segments and low at east-west running segment.
- The alley surface is overgrown.
- Alley is suited to infiltration BMPs. Sheet flow from adjacent streets could be directed into BMPs.
- The north-south segments are CPIO designated TOD High Density Neighborhood Serving Corridor.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	100630
Commercial property (cuft)	41930
Industrial property (cuft)	0
Total runoff (cuft)	142560

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	95534
Pervious runoff (cuft)	4820

Soils Information:

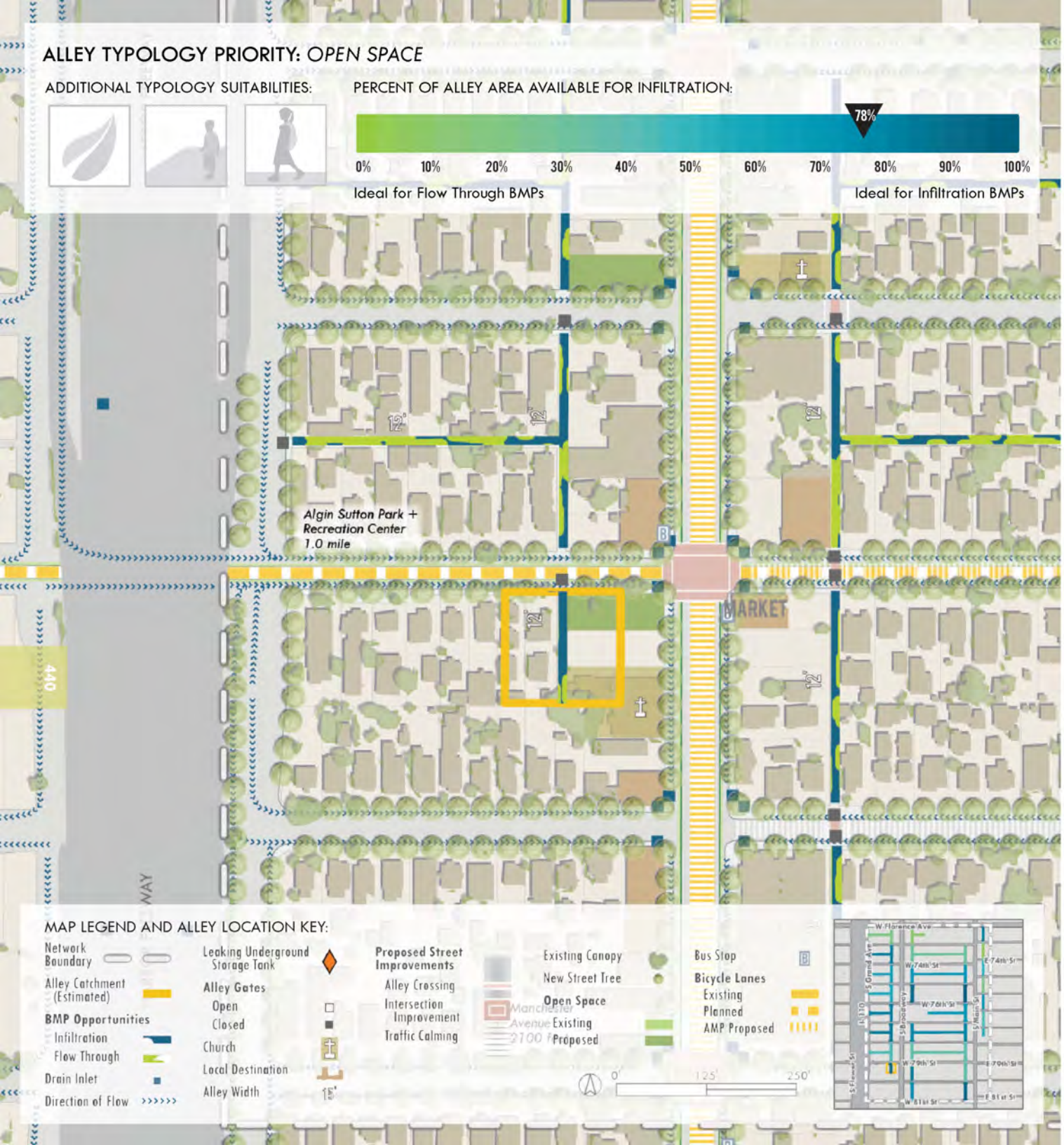
Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	18864
Building Setback (sqft)	10657
Estimated Catchment (sqft)	224569

FIGURE E.115
DETAILED MAP FOR BROADWAY-75TH
NETWORK ALLEY #22





BROADWAY-75TH NETWORK ALLEY #23

DESIGN CONSIDERATIONS:

- Alley parklet could have interpretive programming on stormwater management. It is necessary to work with community members to determine potential gate removal (closed at north end). Redesign efforts should work with members from adjacent church.
- Visibility is defined as moderate because of dead end, however line of sight is good.
- The alley surface is asphalt.
- Proposed park to west increases area for infiltration BMPs. Sheet flow from adjacent street could be directed into alley BMPs.
- CPIO designated TOD High Density Neighborhood Serving Corridor.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	6830
Commercial property (cuft)	11340
Industrial property (cuft)	0
Total runoff (cuft)	18170

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	12379
Pervious runoff (cuft)	381

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	1860
Building Setback (sqft)	403
Estimated Catchment (sqft)	24794

FIGURE E.116
DETAILED MAP FOR BROADWAY-75TH NETWORK ALLEY #23

BROADWAY-75TH NETWORK ALLEY #24

DESIGN CONSIDERATIONS:

- This alley is included in the fitness loop design. However, it will be necessary to work with community members to determine potential gate removal as the alley is closed at both ends.
- Visibility within the alley is high.
- The alley surface is partially concrete and partially overgrown.
- This alley is suited to infiltration BMPs. Sheet flow from adjacent streets could be directed into BMPs in the alley.
- CPIO designated TOD High Density Neighborhood Serving Corridor.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	24540
Commercial property (cuft)	3390
Industrial property (cuft)	0
Total runoff (cuft)	27930

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	18507
Pervious runoff (cuft)	1180

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	3520
Building Setback (sqft)	1046
Estimated Catchment (sqft)	46954



FIGURE E.117
DETAILED MAP FOR BROADWAY-75TH NETWORK ALLEY #24



BROADWAY-75TH NETWORK ALLEY #25

DESIGN CONSIDERATIONS:

- This alley is included in the fitness loop design. However, it will be necessary to work with community members to determine potential gate removal as the alley is closed at the north end.
- Visibility within the alley is high.
- The alley surface is concrete.
- This alley is suited to a mix of stormwater BMPs. Sheet flow from the adjacent street to the south could be directed into an infiltration BMP in alley.
- CPIO designated TOD High Density Neighborhood Serving Corridor.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	12670
Commercial property (cuft)	22170
Industrial property (cuft)	0
Total runoff (cuft)	34840

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	23840
Pervious runoff (cuft)	634

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	3561
Building Setback (sqft)	2024
Estimated Catchment (sqft)	47492

FIGURE E.118
DETAILED MAP FOR BROADWAY-75TH NETWORK ALLEY #25

BROADWAY-75TH NETWORK
ALLEY #26

DESIGN CONSIDERATIONS:

- This alley is included in the fitness loop design. However, it will be necessary to work with community members to determine potential gate removal as the alley is closed at both ends.
- Visibility within the alley is high.
- The alley surface is partially asphalt and partially overgrown.
- This alley is suited to infiltration BMPs. Sheet flow from adjacent streets could be directed into BMPs in the alley.
- CPIO designated TOD High Density Neighborhood Serving Corridor.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	13540
Commercial property (cuft)	19640
Industrial property (cuft)	0
Total runoff (cuft)	33180

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	22632
Pervious runoff (cuft)	683

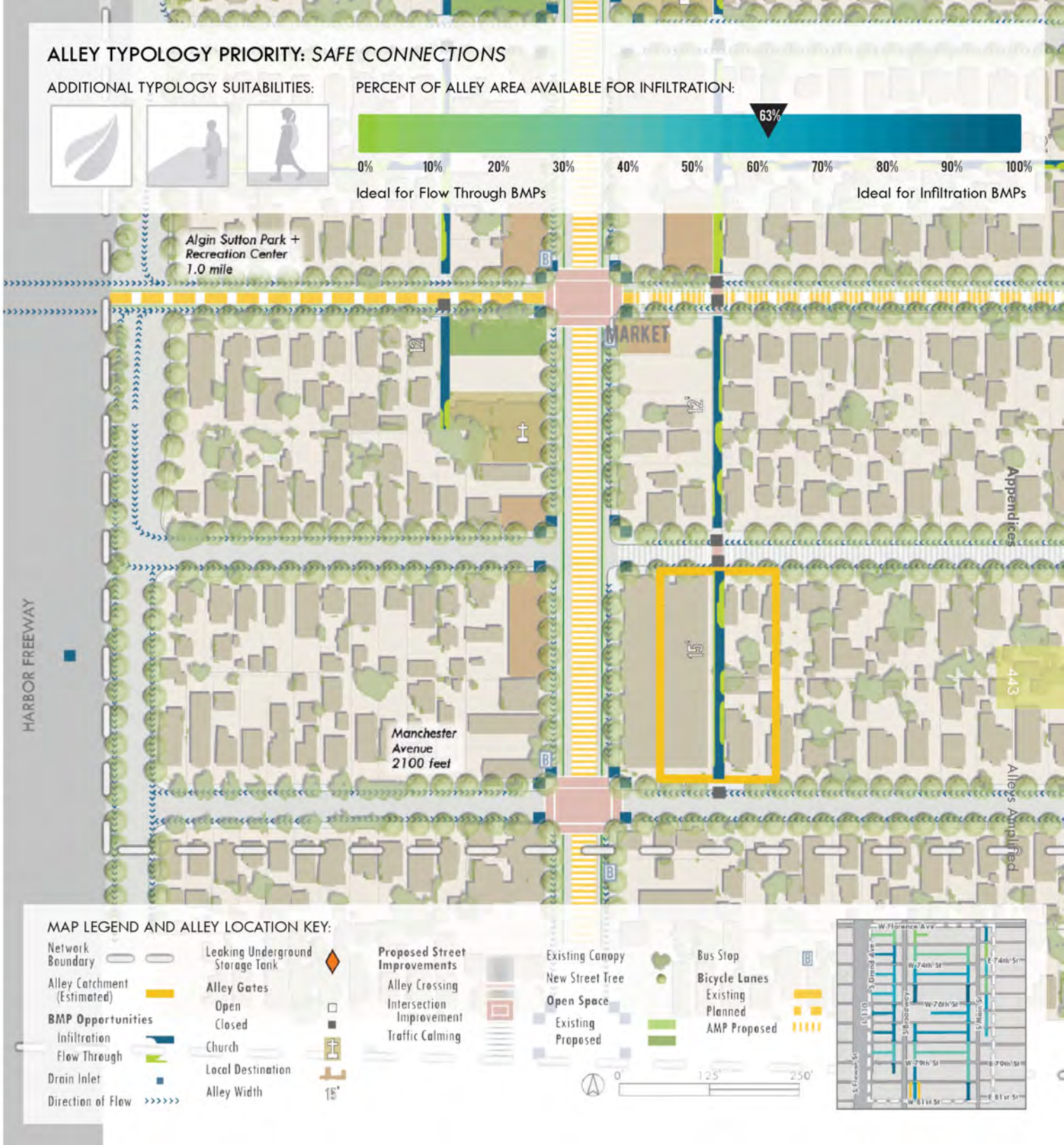
Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	4328
Building Setback (sqft)	1595
Estimated Catchment (sqft)	46114

FIGURE E.119
DETAILED MAP FOR BROADWAY-75TH NETWORK ALLEY #26





BROADWAY-75TH NETWORK ALLEY #27

DESIGN CONSIDERATIONS:

- This alley is included in the fitness loop design.
- Visibility within the alley is high.
- The alley surface is a mix of asphalt and overgrown vegetation.
- This alley is suitable for infiltration BMPs. Sheet flow from adjacent streets to the south and north could be directed into infiltration BMPs in the alley.
- CPIO designated TOD High Density Neighborhood Serving Corridor.

STORMWATER CALCULATIONS:

Runoff Volume by Land Use (Avg. Annual):

Residential property (cuft)	26120
Commercial property (cuft)	0
Industrial property (cuft)	0
Total runoff (cuft)	26120

3/4" Design Storm Capture (Avg. Annual):

Impervious runoff (cuft)	17265
Pervious runoff (cuft)	1156

Soils Information:

Soil name	Hanford Fine Sandy Loam
KSAT rate (in/hr)	0.79
Field capacity (in/ft)	2.45

Dimensions:

Alley (sqft)	4280
Building Setback (sqft)	924
Estimated Catchment (sqft)	46114

FIGURE E.120
DETAILED MAP FOR BROADWAY-75TH NETWORK ALLEY #27

Low impact development is an emerging and important international stormwater management trend. We have begun to capitalize on the valuable services that nature can offer us: capturing, cleaning, and storing stormwater.

Chau, 2009

The ten neighborhoods of South Los Angeles are the most impacted areas of the City of Los Angeles in terms of park poverty, poor public health indicators, lack of tree canopy, high crime rates, low educational attainment, and limited economic investment. Alleys Amplified: The South Los Angeles Green Alley Master Plan (AMP) takes an imaginative yet analytic approach to addressing some of these issues by creating a framework for a system of green alley and street networks that collectively provide multiple benefits over an extended area. Benefits of green alleys and green streets include improved environmental infrastructure, decreased urban heat island impacts, increased water infiltration and water quality, improved community connections and community safety, and increased walkability. The AMP Presents an analytical process for identifying networks of multiple alley segments, streets, and vacant lots that hold the greatest potential for positively impacting the issues of park poverty, community connectivity, and stormwater runoff and volume. Through a process of inventory research, GIS mapping, and community outreach, the AMP develops a master plan for implementing green alley networks in a series of coordinated phases throughout the 18-square-mile project area.

Alleys Amplified proposes greener, safer, and smarter alley networks that include usable open space, safe connections to community destinations, and low-impact infrastructure. While alleys may initially seem to be spaces too small to address such significant issues, the collective network of alleys and their surrounding streets in South Los Angeles comprises 3.12 square miles or almost three times the size of New York's Central Park. Green alleys and streets have the clear potential to provide multiple benefits to neighborhoods without available undeveloped land. The diverse benefits provided by intensive urban landscapes such as green alleys and streets make projects like the AMP not only worthwhile, but invaluable to the communities they serve.

Prepared for
The City of Los Angeles Bureau of Sanitation

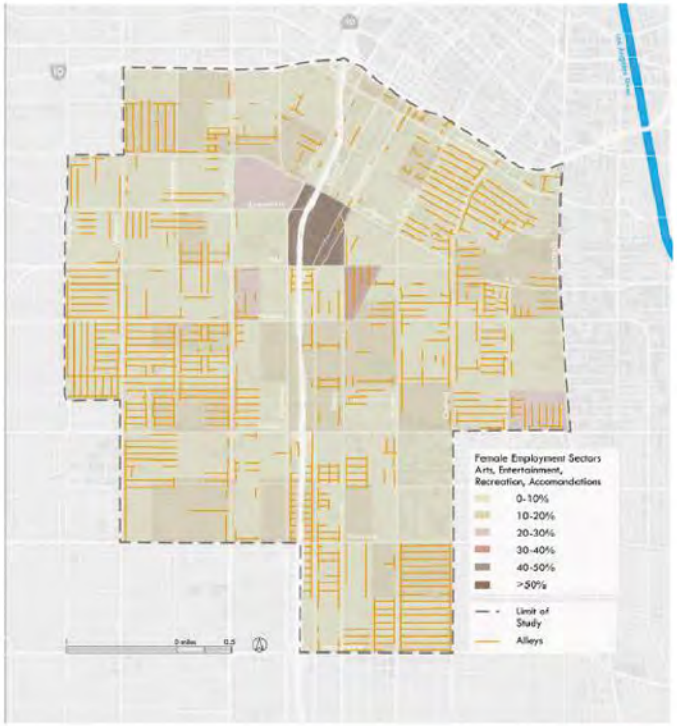
By
The Trust for Public Land, Los Angeles
606 Studio, 2012 | Department of Landscape Architecture | College of Environmental Design
California State Polytechnic University, Pomona
Council for Watershed Health

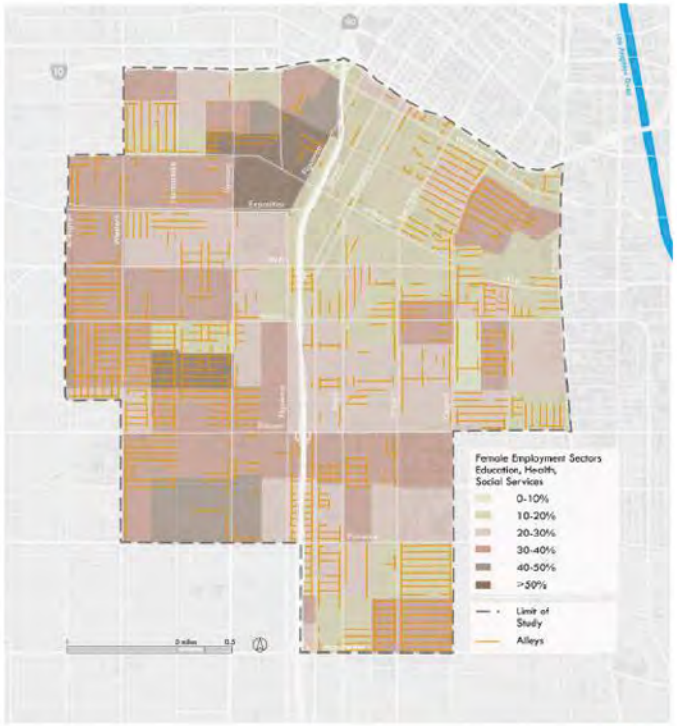
With Support From
Jefferson High School
Council District 9, Councilmember Curren D. Price, Jr.
Council Distrcit 8, Councilmember Bernard C. Parks, Jr.

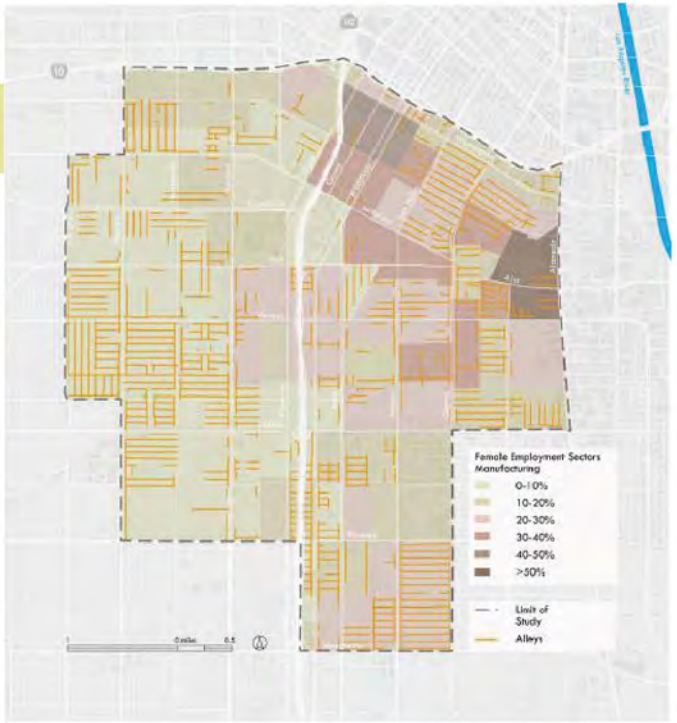
APPENDIX F
Supplemental Inventory



FIGURE F.1
ADULT MALE EMPLOYMENT SECTORS IN THE AMP PROJECT AREA







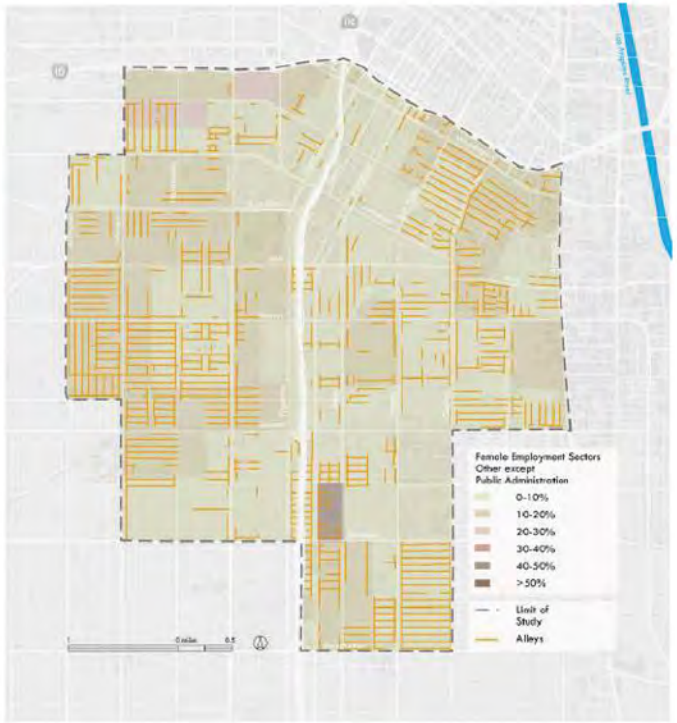


FIGURE F.2
ADULT FEMALE EMPLOYMENT SECTORS IN THE AMP PROJECT AREA

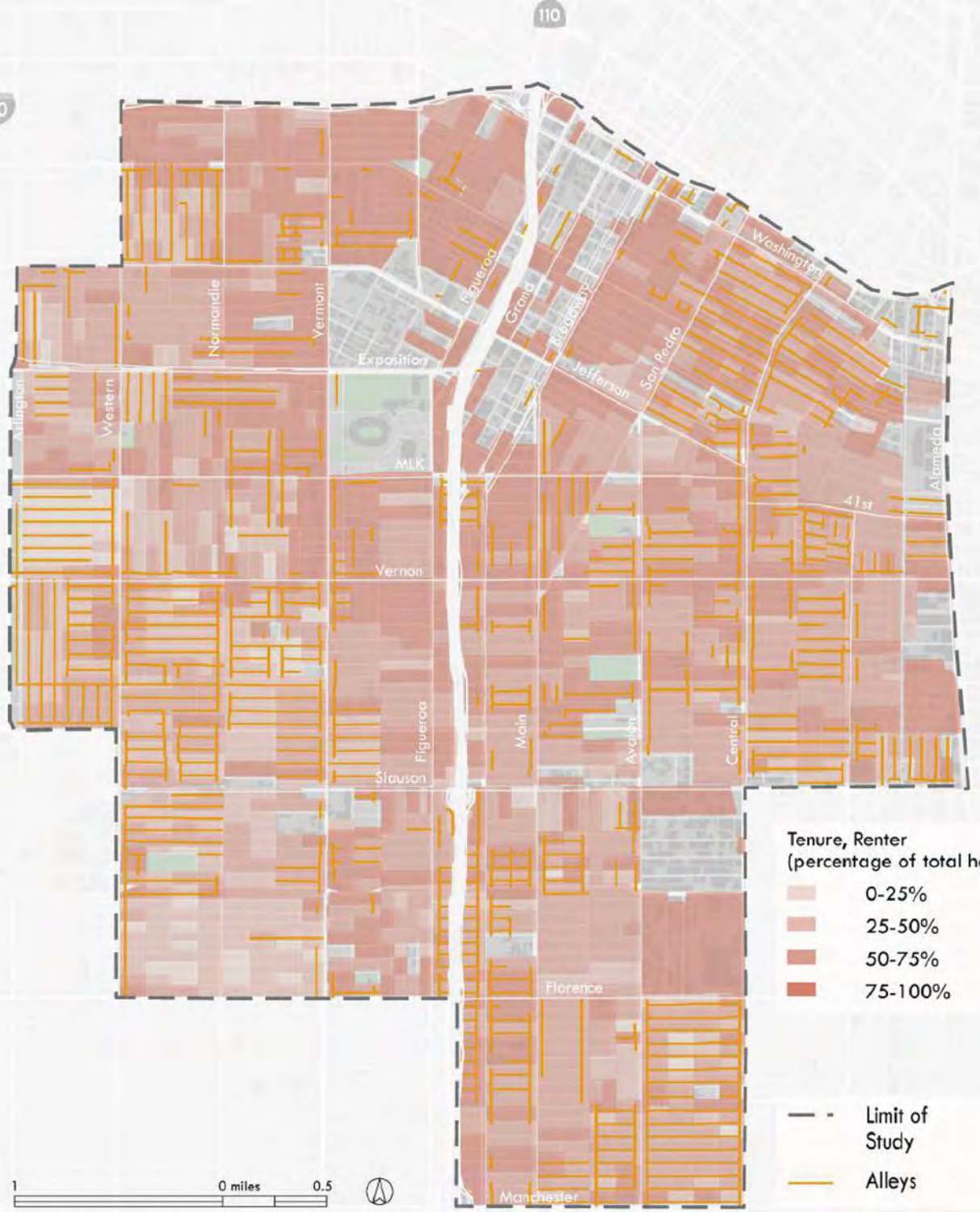


FIGURE F.3
NON-OWNER-OCCUPIED RESIDENCES IN THE AMP PROJECT AREA

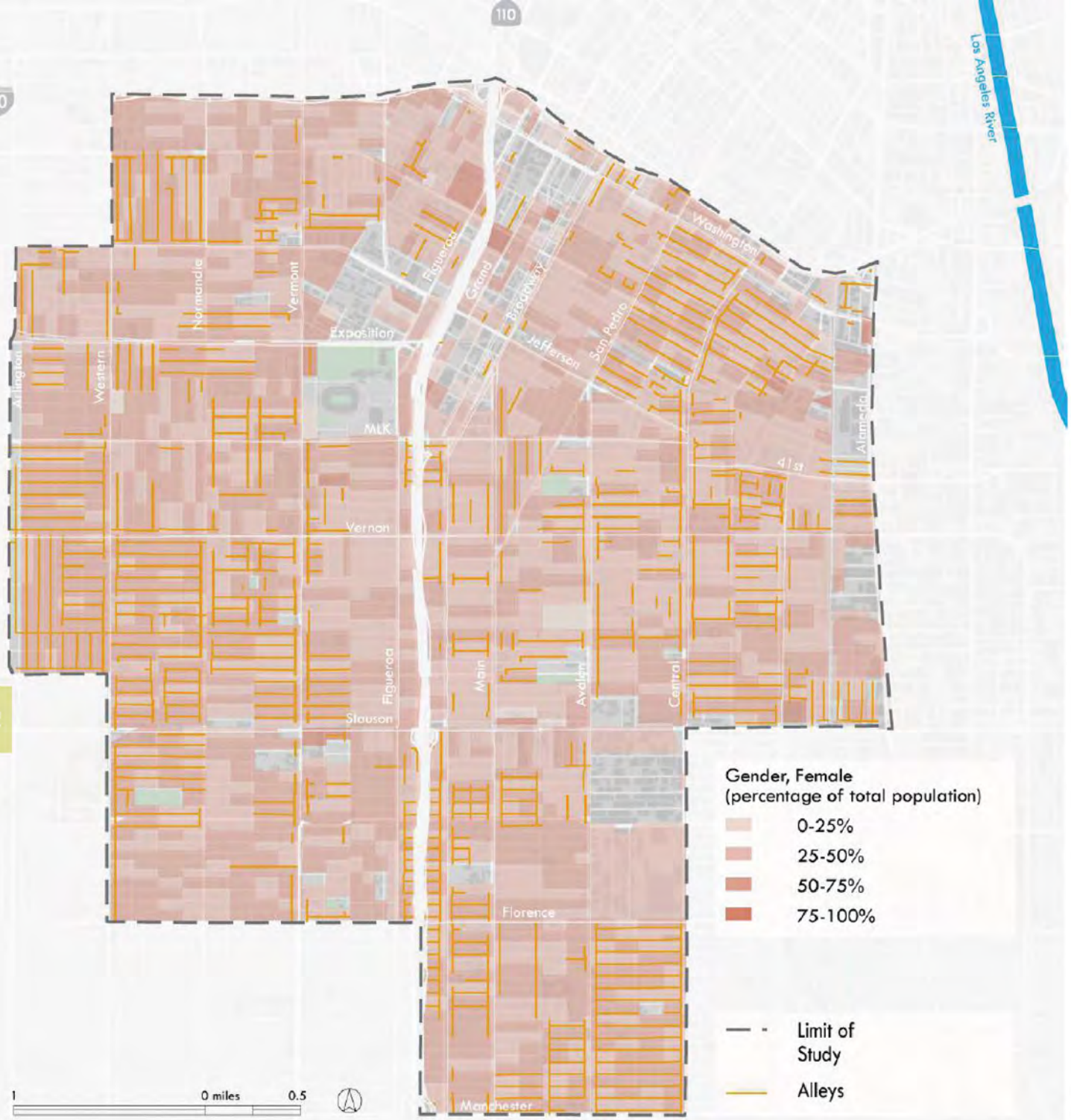


FIGURE F.4
FEMALES IN THE AMP PROJECT AREA

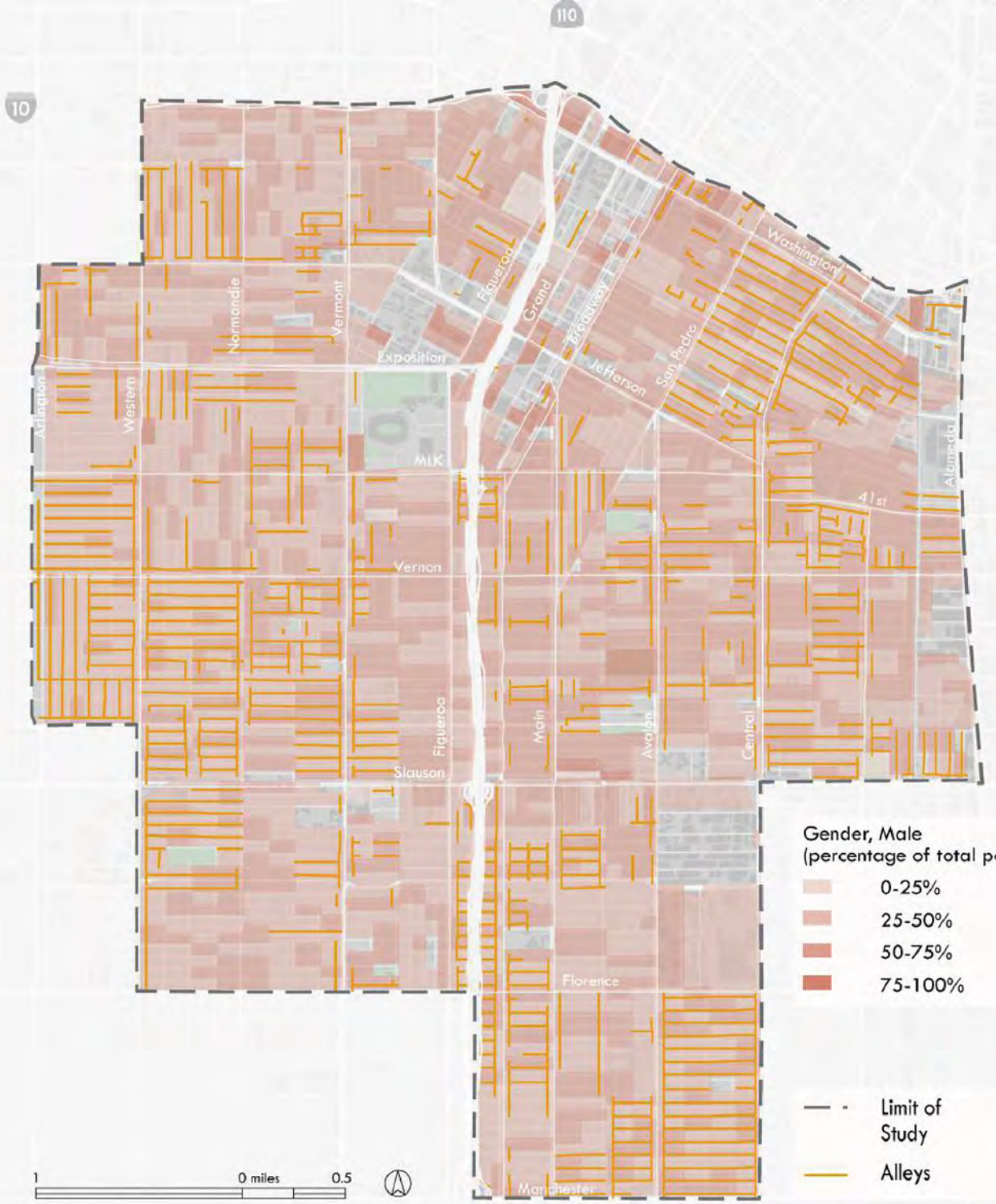


FIGURE F.5
MALES IN THE AMP PROJECT AREA

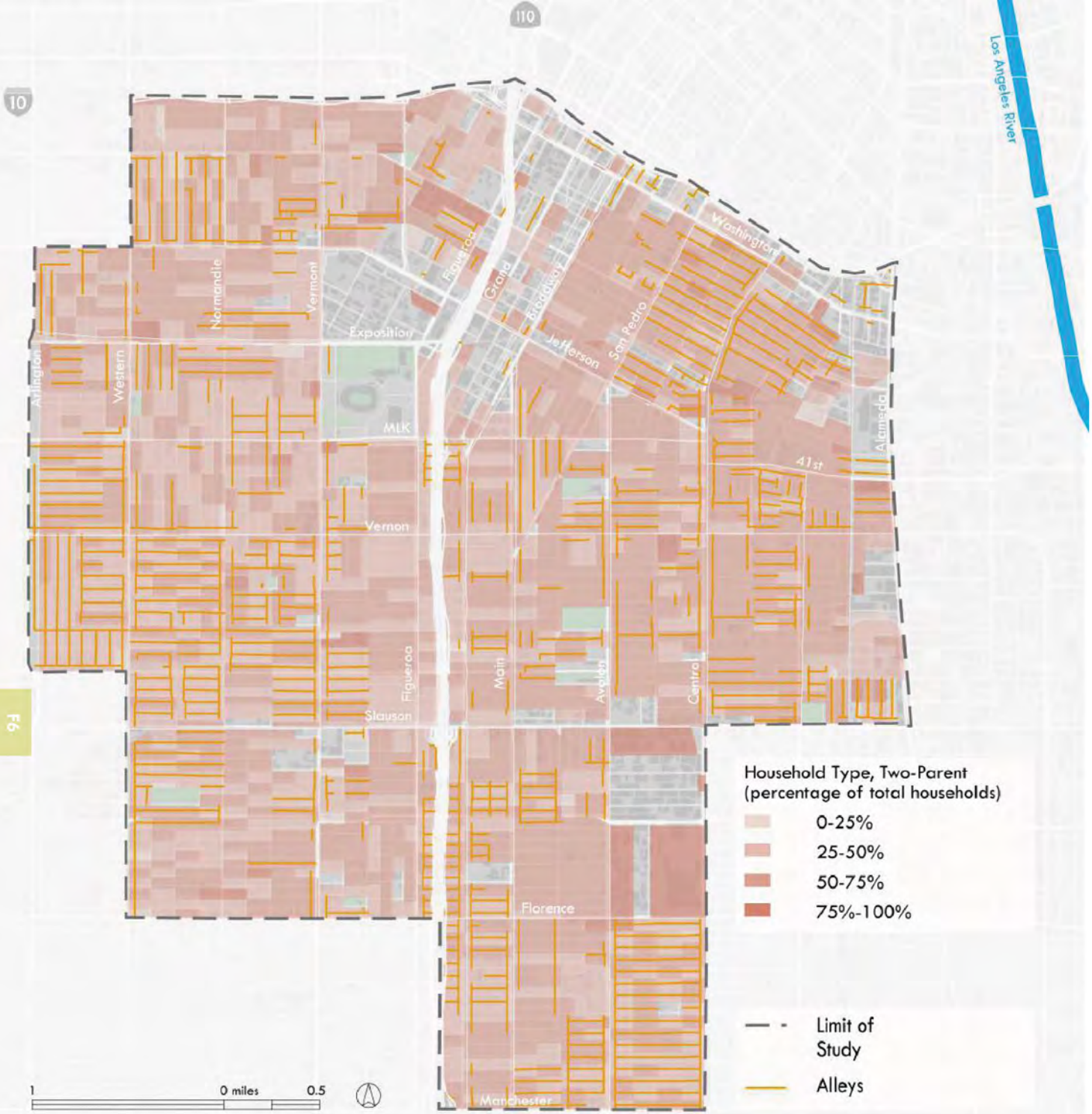


FIGURE F.6
TWO-PARENT HOUSEHOLDS IN THE AMP PROJECT AREA

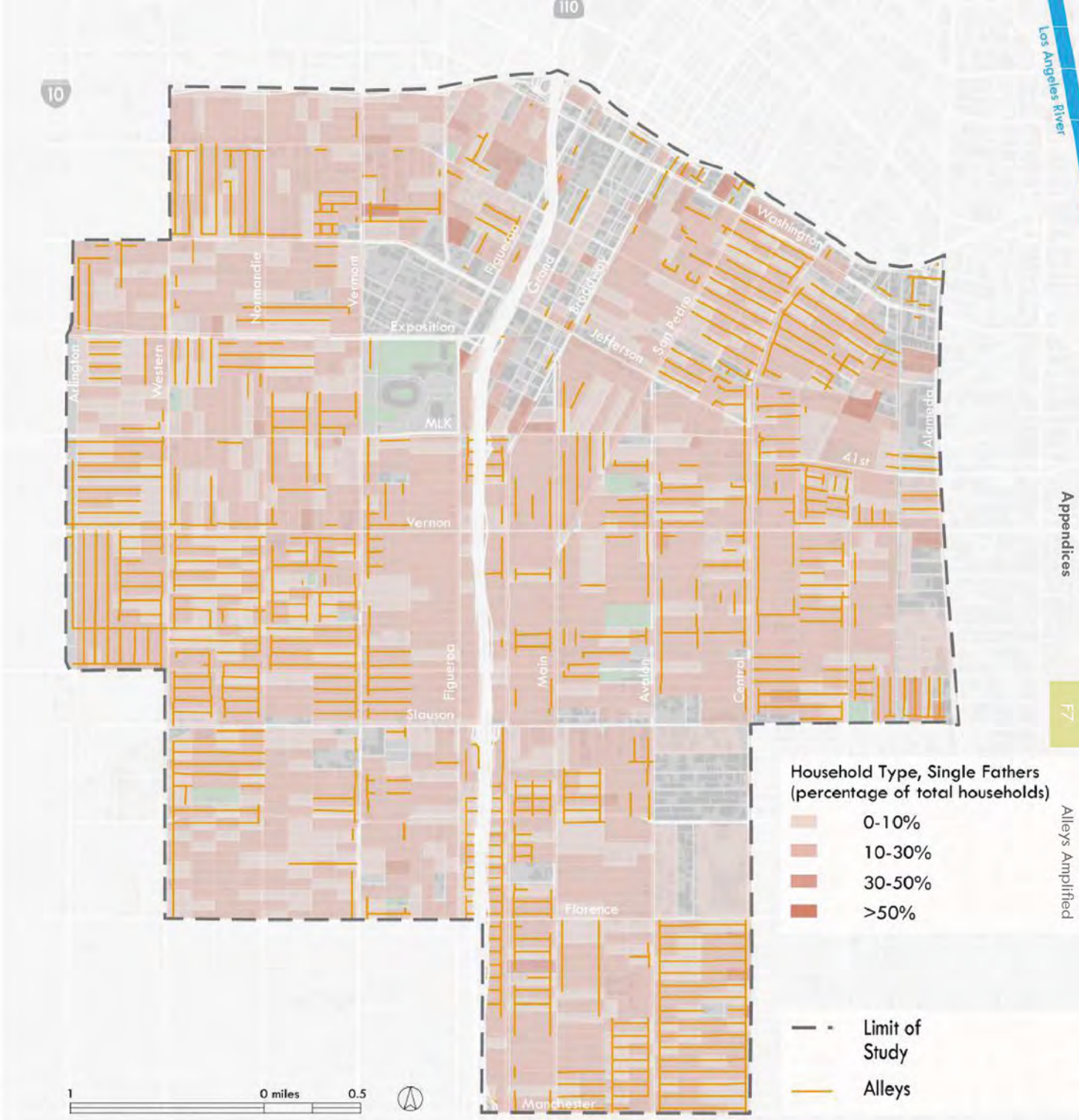


FIGURE F.7
SINGLE FATHER HEADS OF HOUSEHOLD
IN THE AMP PROJECT AREA

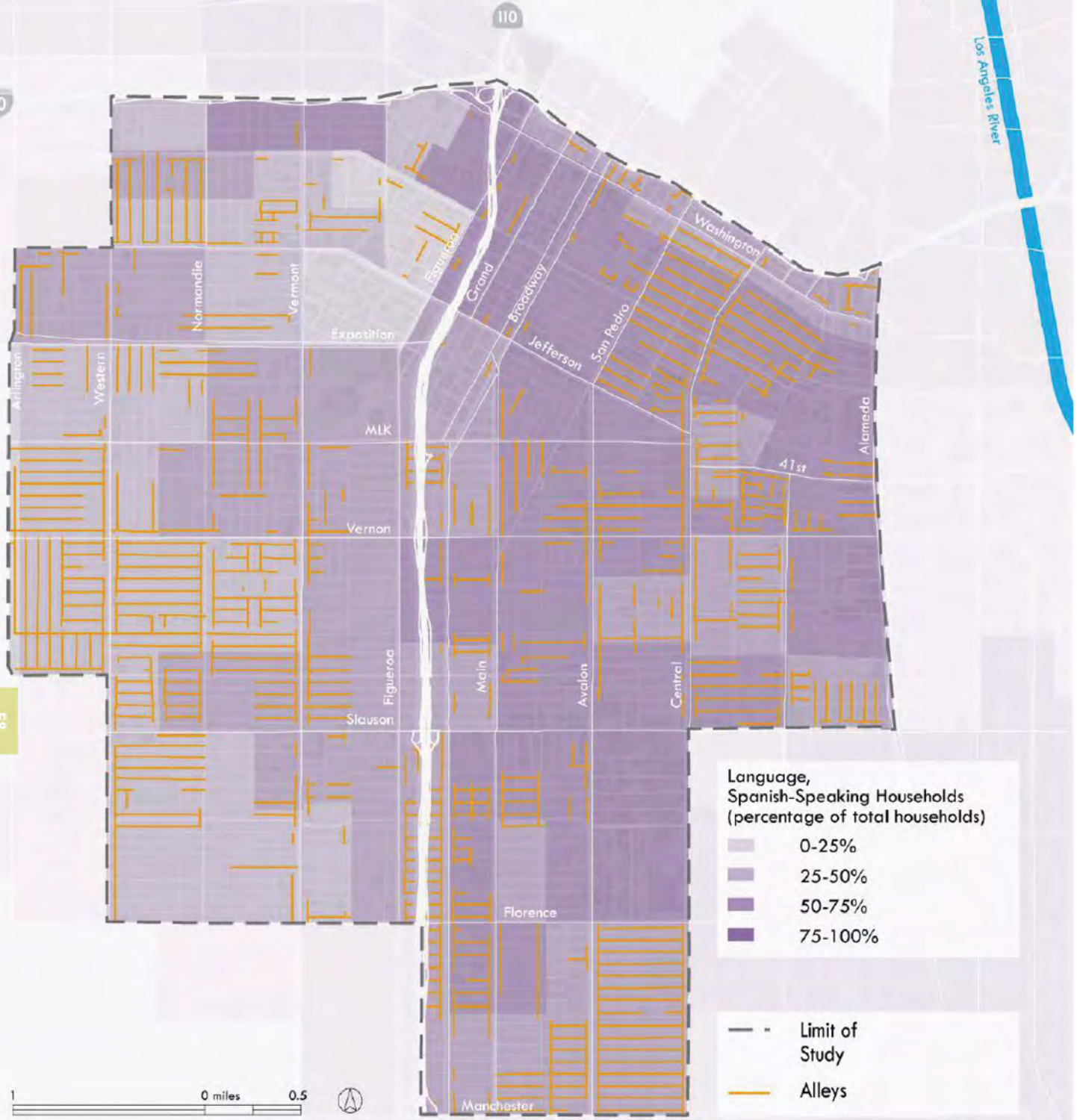


FIGURE F.8
SPANISH SPEAKING HOUSEHOLDS
IN THE AMP PROJECT AREA

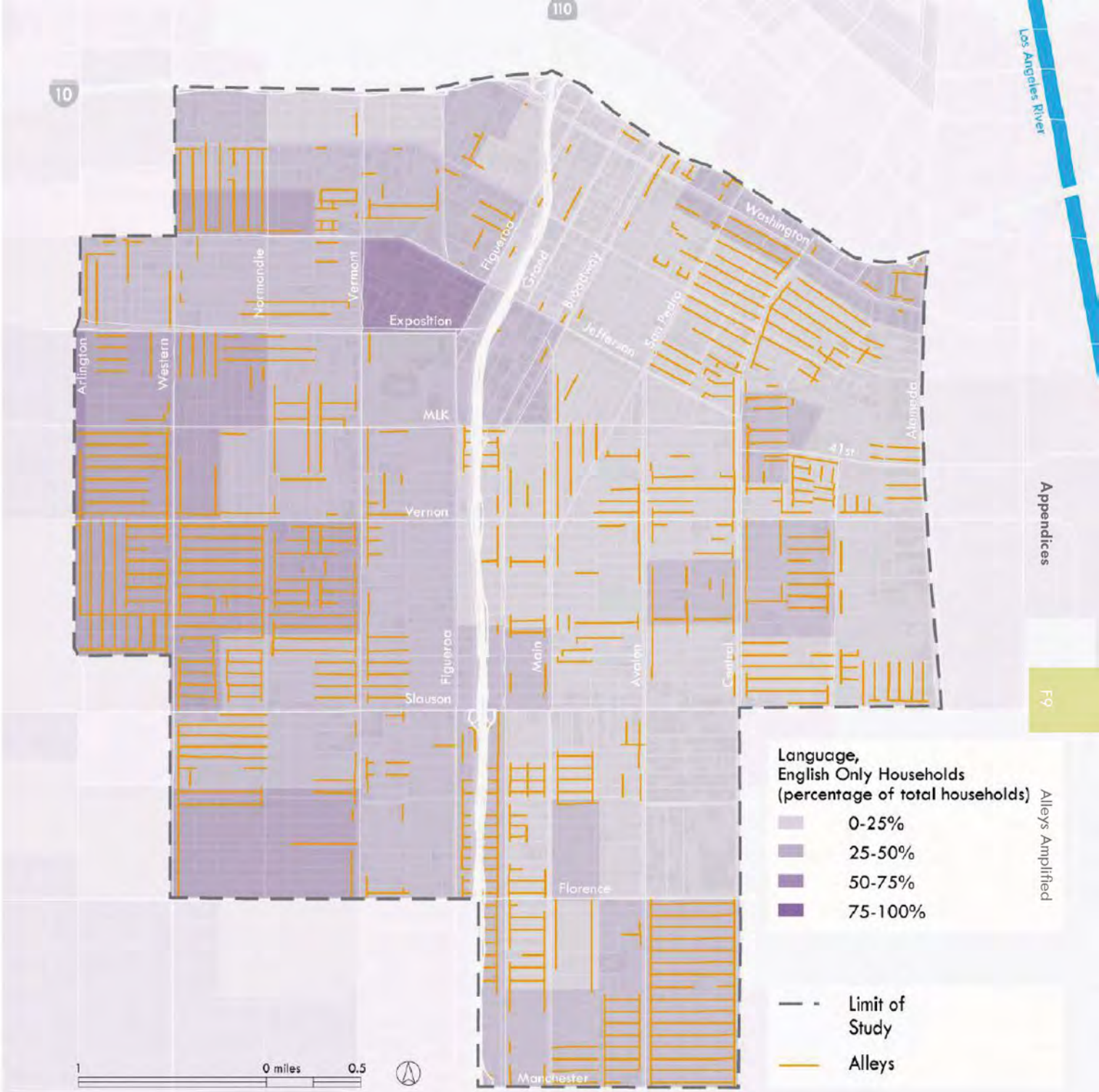


FIGURE F.9
ENGLISH SPEAKING HOUSEHOLDS
IN THE AMP PROJECT AREA

Judging by the performance of past types of urban morphology, five design values appear particularly important for more sustainable urban form in the future: compactness, contiguity, connectivity, diversity, and ecological integration.

Wheeler, 2003

APPENDIX G

PRELIMINARY COMMUNITY INPUT: OUTREACH MATERIALS

SIDE WALK SURVEY QUESTIONNAIRE VERSION 1

Team _____
South LA Green Alleys

Survey # _____
Landscape Architecture, Cal Poly Pomona
3801 West Temple Blvd.
Pomona, CA 91768

We are gathering information about the alleys in South Los Angeles to identify areas that need improvement. We need your help to understand what you think. Do you have 5 minutes to answer some questions for us?

Estamos recopilando información acerca de los callejones del sur de Los Ángeles, para identificar áreas que necesitan mejorar. Necesitamos su ayuda para entender sus opiniones. Sus ideas nos ayudarán a reconocer su potencial. ¿Puede contestar algunas preguntas para nosotros?

_____

1. What neighborhood do you live in? Or, what are your closest major cross streets?
¿En que vecindario vive usted? ¿O, cuales son las calles transversales más cercanas?

- ○ Adams-Normandie
- ○ Central-Alameda
- ○ Exposition Park
- ○ Florence
- ○ Harvard Park
- ○ Historic South Central
- ○ South Park
- ○ University Park
- ○ Vermont-Slauson
- ○ Vermont Square
- ○ Other/*Otro* (Specify/*Especificar*) _____

2. What are your favorite outdoor spaces in your neighborhood? Why do you like them?
¿Cuáles son sus espacios favoritos al aire libre en su barrio? ¿ Por qué le gustan?

3. What do you like to do in your favorite park?
¿Qué le gusta hacer en su parque favorito?

4. How often do you walk in your neighborhood? Where? Why?
¿Con qué frecuencia camina usted in su vecindario? ¿Dónde? ¿Por qué?

5. How often do you bicycle? Where? Why?
¿Con qué frecuencia anda usted en bicicleta? ¿ Dónde? ¿Por qué?

6. How do you use the alleys in your neighborhood?
¿Qué uso le da a los callejones en tu vecindario?

- ○ I don't use the alleys / *No uso los callejones*
- ○ I use them as follows: / *Los uso de la siguiente manera:*

7. What are the good things about the alleys in your neighborhood?
¿Cuáles son las cosas buenas o útiles acerca los callejones en su vecindario?

8. Do you have concerns about the alleys in your neighborhood?
¿Tiene inquietudes acerca de los callejones en su vecindario?

○ No *No* ○ Yes *Sí* **Can you tell me what your concerns are?** *¿Me puede decir cuáles son sus inquietudes?*

9. Is there anything else you would like us to know about alleys here?
¿Hay algo más que le gustaría que supiéramos acerca de los callejones?

Q1: Home Neighborhood

Response	Frequency
	total: 25
Historic South Central	18
South Park	3
Compton	2
Exposition Park	1
Central-Alameda	1

Q1: Home Cross-Streets

Response	Frequency
	total: 14
Main & 54th	4
51st & San Pedro	2
47th & Broadway	1
55th & San Pedro	1
Main & 55th	1
98th & Broadway	1
Avalon	1
56th & Town	1
Koreatown	1
Pico & Union	1

Q2: Favorite Outdoor Spaces

Response	Frequency
	total: 53
Local Parks (Specific)	16
None	12
Wetland Park	12
Local parks (General)	8
Local streets	2
Backyard	2
Non-traditional (Museum)	1

Q2: Favorite Space Reason

Response	Frequency
	total: 9
Aesthetics/Environment (looks nice)	3
Active amenities (Mountains for hiking/family facilities)	2
Program (Community activities)	1
Don't spend time outside	1
Thugs in South Park	1
Too crowded	1

Q3: Favorite Park Activities

Response	Frequency
	total: 25
Passive Recreation (Exercise/Walking/Running/Biking/Dog)	18
Solitary Activity (Relax/People Watching)	8
Active Recreation (Soccer/Bball/Baseball/Swim)	6
Play w kids/grandkids/siblings	4
Social Activity (Picnic)	4

Q4: Walking Frequency

Response	Frequency
	total: 36
Multiple per day-Everyday	15
Multiple per week-Often	11
Once per week-Sometimes	0
Not often-Never	10

Q4: Walking Destinations

Response	Frequency
	total: 14
Store	5
School	3
Local Parks	2
Work	2
Errands (Laundromat)	1
Transportation (Bus)	1

Q4: Walking Reasons

Response	Frequency
	total: 11
Unsafe (Gangs, loose dogs)	6
Exercise/Health	2
Have to (Don't own car, disabled)	2
Don't like to	1

Q5: Biking Frequency

Response	Frequency
	total: 35
Not often-Never	27
Multiple per week-Often	4
Once per week-Sometimes	3
Multiple per day-Everyday	1

Q5: Biking Destinations

Response	Frequency
	total: 5
Around neighborhood	2
Local parks	1
Friends' houses	1
Regional (Downtown)	1

Q5: Biking Reasons

Response	Frequency
	total: 12
Don't own a bike	3
Bike will get stolen	1
Prefer driving	1
Feels safe	1
Exercise	1
Dangerous	1
Recreation	1
Too many cars/No bike path	2
Lack of time	1

Q6: Alley Use

Response	Frequency
	total: 27
Don't use	19
Shortcuts	5
Avoid traffic	1
Sit around	1
Access (Parking access)	1

Q7: Alley Good Things

Response	Frequency
	total: 26
Nothing	16
Clean/Maintained (Paved, Neighbor sweeps & cleans)	5
Shortcuts	2
Safe	2
Neutral	1

Q:8 Alley Concerns

Response	Frequency
	total: 49(%)
Yes (respondent has concerns)	21
No (respondent has no concerns)	16
Dirty (dumping, trash, debris, clothing, odor)	17 (35)
Crime/Criminals (Drug uses/dealing)	12 (24)
Unsafe/Dangerous	10 (20)
Loitering (Homeless)	5 (10)
Hazards/Poor Maintenance (unpaved, cracks, pot holes, trash, debris)	3 (6)
Dogs (barking)	1 (2)
Parked cars in alleys	1 (2)

Q9: Additional Comments

Response	Frequency
	total: 15
Would appreciate alleys getting cleaned up/Alleys need to be cleaned	2
Like wetland park but things get destroyed	1
Heard someone got raped	1
True Samaritan Church tried to collect signatures to close alley, but didn't get enough	1
Police can't get through the alleys, and thugs know it	1
Changed name of South Park to Barry White Park	1
People throw things over their fence into alley	1
Dumping is by residents and people w/trucks	1
Flowers in alleys would excite people	1
Need more places like the Wetland Park	1
Already have graffiti on signs in Wetland Park	1
Alleys need improvement	1
Would like to volunteer (Cesar)	1
Would like to see a playground	1

Q1: Home Neighborhood

Response	Frequency
	total: 13
Central-Alameda	8
Historic South Central	3
South Park	2

Q1: Home Cross-Streets

Response	Frequency
	total: 20
42nd & Central	2
43rd & Central	1
MLK & Morgan	1
32nd & Central	1
46th & Hooper	1
Avalon & Vernon	1
Central & Vernon	1
41st & Central	1
42nd & Avalon	1
64th & Avalon	1
47th & Central	1
McKinley	1
Bellflower	1
Downey	1
47th & Avalon	1
51st & McKinley	1
41st & Hooper	1
41st & Compton	1
Normandie & 39th	1

Q2: Favorite Outdoor Spaces

Response	Frequency
	total: 43
Parks (Specific) Gilbert Lindsay	20
None	9
Local Parks (General)	6
Streets (Central Ave)	3
Backyard	1
Ice cream shop	1
Backyard	1
School	1
Library	1

Q2: Favorite Space Reason

Response	Frequency
	total: 18
Aesthetics/Environment (Clean,Trees,Green)	5
Emotional (Peaceful)	4
Convenience (Close to home)	2
Exercise/Health	1
Games for kids	1
Safe for kids	1
Drug Addicts	1
Active amenities	3

Q3: Favorite Park Activities

Response	Frequency
	total: 43
Solitary Activity	11
Passive Recreation	11
/Play with kids/grandkids	10
Active Recreation	6
Social Activity	5

Q4: Walking Frequency

Response	Frequency
	total: 33
Multiple per Day-Everyday	20
Not Often-Never	7
Multiple per Week-Often	4
Yes	2
Once per Week-Sometimes	0

Q4: Walking Destinations

Response	Frequency
	total: 42
Store	13
Local Parks	7
School	8
Friends	5
Public Transportation	2
Shopping	2
Clinic	1
Work	1
Errands	1
School	1
Bar	1

Q4: Walking Reasons

Response	Frequency
	total: 12
No transportation	5
Exercise/Health	4
Run errands	1
Unsafe	1
Convenience(Fastest route)	1

Q5: Biking Frequency

Response	Frequency
	total: 34
Once per month-Not often-Never	27
Multiple per Day-Everyday	4
Multiple per Week-Often	2
Once per Week-Sometimes	1

Q5: Biking Destinations

Response	Frequency
	total: 11
Store	4
Park	2
Medical (Clinic)	1
Friends	1
Work	1
Church	1
Errands	1

Q5: Biking Reasons

Response	Frequency
	total: 14
Don't own a bike	5
Prefers to walk	1
Recreation (Leisure)	3
Exercise	2
Convenience (Faster)	1
No transportation	1
Unsafe	1

Q6: Alley Use

Response	Frequency
	total: 34
Don't use	23
Shortcuts	9
Not to be seen	1
Hanging out	1

Q7: Alley Good Things

Response	Frequency
	total: 30
Nothing	19
Shortcut	9
Gates	1
People	1

Q:8 Alley Concerns

Response	Frequency
	total: 66
Yes (respondent has concerns)	26
No (respondent has no concerns)	2
Dirty (dumping, trash, debris, clothing, odor)	22
Unsafe/Dangerous/Gangs/People die in the alleys	14
Drugs/Crime/Prostitution	7
Poor lighting	4
Loitering/Homeless	3
Unwanted activities (Bathroom/Drinking/Fighting)	3
Vandalism (graffiti)	9
Hazards (paving problems)	4

Q9: Additional Comments

Response	Frequency
	total: 17
Would appreciate alleys getting cleaned up/Alleys need to be cleaned	11
Need more cops	1
Rats	1
Not concerned about safety	1
Too much trash on streets	1
Somebody cleaned the alley	1
Was robbed in alley	1

Q1: Home Neighborhood

Response	Frequency
	total: 15
Exposition Park	7
Adams-Normandie	4
Florence	1
Harvard Park	1
Vermont Square	1
Vermong-Slauson	1

Q1: Home Cross-Streets

Response	Frequency
	total: 11
Western	2
Western & MLK	1
Culver City	1
Jefferson & Western	1
Victorville	1
Hollywood	1
Gardena	1
Expo & Harbor	1
Western & Adam	1
MLK	1

Q2: Favorite Outdoor Spaces

Response	Frequency
	total: 37
Local parks (General)	13
Park (Specific)	8
Non-Traditional (Shopping, Museum, Library)	7
None	4
Garden (Rose Garden)	2
Recreation Center	1
Beach	1
Backyard	1

Q2: Favorite Space Reason

Response	Frequency
	total: 12
Open space (Places to be outside)	3
Programed Activities (Basketball programs, educational programs for kids)	3
Aesthetics/Environment	3
Safe (No crime, free concern)	2
Amenities (Bathroom)	1

Q3: Favorite Park Activities

Response	Frequency
	total: 34
Solitary Activity	12
Social Activity	7
Play with kids/grandkids	6
Active Recreation	6
Passive Recreation	3

Q4: Walking Frequency

Response	Frequency
	total: 26
Multiple per Day-Everyday	17
Multiple per Week-Often	4
Once per Week-Sometimes	1
Not often-Never	4

Q4: Walking Destinations

Response	Frequency
	total: 20
School	5
Store	4
Work	4
Public Transportation (Bus stop)	2
Friend	2
Around the block	1
Local Park	1
Library	1

Q4: Walking Reasons

Response	Frequency
	total: 8
Exercise/Health	4
Convenient (Close to home)	1
Open space	1
Walk kids	1
Recreation	1

Q5: Biking Frequency

Response	Frequency
	total: 27
Multiple per Day-Everyday	2
Multiple per Week-Often	9
Once per Week-Sometimes	2
Not often-Never	14

Q5: Biking Destinations

Response	Frequency
	total: 4
USC	1
Store	1
School	1
Around neighborhood	1

Q5: Biking Reasons

Response	Frequency
	total: 8
Exercise	3
Recreation (Fun)	2
Safe (Stay out of danger)	1
Transportation	1
Bike with kids	1

Q6: Alley Use

Response	Frequency
	total: 27
Don't use	19
Shortcuts	5
Avoid traffic	1
Sit around	1
Access (Parking access)	1

Q7: Alley Good Things

Response	Frequency
	total: 19
Nothing	16
Clean/Maintained	5
Shortcuts	2
Safe	2
Neutral	1

Q:8 Alley Concerns

Response	Frequency
	total: 39
Yes (respondent has concerns)	23
No (respondent has no concerns)	5
Dirty (dumping, trash, debris, clothing, odor, unattractive)	15
Unsafe/Dangerous (Gangs)	10
Crime/Criminals (Drug uses/dealing)	6
Loitering (Homeless)	3
Hazards/Poor Maintenance (unpaved, cracks, pot holes, trash, debris)	1
Drinking/Smoking	1
Escape routes for criminals	1
Animals	1
Graffiti	1

Q9: Additional Comments

Response	Frequency
	total: 15
Would appreciate alleys getting cleaned up/Alleys need to be cleaned	11
City of LA does great job	1
No people	1
More security	1
Green walls	1
Police can be aggressive & condescending, avoid alleys to avoid police & gangs	1
demographics self-inclusive, keep to own areas	1

Q1: Home Neighborhood

Response	Frequency
	total: 14
Vermont Square	4
Exposition Park	2
Vermont-Slauson	2
Baldwin Hills	1
Adams-Normandie	1
Central-Alameda	1
Historic South Central	1
Koreatown	1
Huntington Park	1

Q1: Home Cross-Streets

Response	Frequency
	total: 13
Vermont & Vernon	4
Vermont & Kansas	1
Normandie & 48th	1
Vernon & Western	1
Vernon & Van Buren	1
Vermont & Century	1
49th	1
Bell	1
Vernon & Central	1
43rd	1

Q2: Favorite Outdoor Spaces

Response	Frequency
	total: 38
Local parks (Trails, Playgrounds,Sports Fields)	13
Local Parks (Specific)	10
Non-traditional (Museum, Mall, Amusement Park)	6
None	5
Garden (Garden/Rose Garden)	2
Local streets	2

Q2: Favorite Space Reason

Response	Frequency
	total: 13
Active Amenities	5
Open Space	3
Emotional ("Makes Happy", Free, Calm)	3
Aesthetics/Environment (Beautiful/Flowers/Atmosphere, Shade)	2

Q3: Favorite Park Activities

Response	Frequency
	total: 44
Play with kids/grandkids	10
Passive Recreation	10
Active Recreation	8
Social Activity	8
Solitary Activity	5
Programmed Activity (Salsa, Museum)	3

Q4: Walking Frequency

Response	Frequency
	total: 23
Multiple per day-Everyday	8
Yes	7
Not Often-Never	7
Multiple per Week-Often	1
Once per Week-Sometimes	0

Q4: Walking Destinations

Response	Frequency
	total: 16
Local Park	5
Store	3
Library	2
Around the block	2
Colosseum	1
Public Transportation	1
Eat/Food/Restaurant	1
School	1

Q4: Walking Reasons

Response	Frequency
	total: 14
Exercise	4
No transportation	3
Saves money	2
Recreation (Enjoys walking, fun)	2
To be outside (fresh air)	1
Run errands	1
Doesn't like to drive	1

Q5: Biking Frequency

Response	Frequency
	total: 24
Not Often-Never	17
Yes	3
Once per Week-Sometimes	2
Multiple per Week-Often	2
Multiple per Day-Everyday	0

Q5: Biking Destinations

Response	Frequency
	total: 5
Expo	2
School	2
Park	1

Q5: Biking Reasons

Response	Frequency
	total: 10
Don't own a bike	2
Prefers to walk/skate	3
Bike with kid	2
Saving money	1
Exercise	1
Too old	1

Q6: Alley Use

Response	Frequency
	total: 24
Don't use	21
Shortcuts	1
Infrequently	1
"Can't drive cars"	
Walking	
Yes	1

Q7: Alley Good Things

Response	Frequency
	total: 27
Nothing	13
Access	2
Shortcut	2
Car Parking	2
Car Access	2
Need a key/Locked	2
Escape	1
Convert to green spaces	1
Trash	1
Maintained (Clean)	1

Q:8 Alley Concerns

Response	Frequency
	total: 44
Yes (respondent has concerns)	19
No (respondent has no concerns)	3
Dirty (dumping, trash, debris, clothing, odor)	15
Unsafe/Dangerous	15
Poor lighting	4
Homeless	2
Mean dogs	2
Locked	1
Drug dealers/Crime/Theft	2
Hazardous materials	1
Vandalism/Graffiti	2

Q9: Additional Comments

Response	Frequency
	total: 21
Would appreciate alleys getting cleaned up/Alleys need to be cleaned	9
Need more lighting	2
Need patrol, neighborhood watch	2
Prefer streets	2
Prefer alleys closed	1
Make safer	1
Would volunteer to clean	1
Paving problems	1
Prefer alleys provide access	1
Surveillance	1

Q1: Home Neighborhood

Response	Frequency
	total: 24
Historic South Central	10
South LA	1
South Park	4
Wilmington	1
Watts	1
Florence	1
Adams Normandie	2
Huntington Park	1
San Dimas	1
San Pedro	1
Whittier	1

Q1: Home Cross-Streets

Response	Frequency
	total: 3
East 30th	1
East 42nd	1
Vernon St	1

Q2: Favorite Outdoor Spaces

Response	Frequency
	total: 25
Parks (General/Playgrounds)	13
None	7
Parks (Specific)	4
Non-traditional (Museums)	1

Q2: Favorite Space Reason

Response	Frequency
	total: 8
Not safe to be outside	1
Never outside	1
Too much sun	1
Too many homeless	1
Safe	1
Children can enjoy themselves	2
People watching on streets	1

Q3: Favorite Park Activities

Response	Frequency
	total: 29
None	2
Passive Recreation	12
Active Recreation	8
Socialize (BBQ, Music)	2
Solitary Activity (Read)	1
Play with kids/grandkids	4

Q4: Walking Frequency

Response	Frequency
	total: 22
Multiple per Day-Everyday	11
Not Often-Never	7
Multiple per Week-Often	4
Once per Week-Sometimes	0

Q4: Walking Destinations

Response	Frequency
	total: 23
Store	10
School	4
Work	4
Public Transportation (Bus)	2
Friends'/Relatives' houses	1
Local Parks	1
Errands (Laundromat)	1

Q4: Walking Reasons

Response	Frequency
	total: 9
Dangerous	2
To be outside (fresh air)	1
Uses car	1
Too busy	1
Poor lighting	1
Drug use	1
Lazy	1
Safe	1

Q5: Biking Frequency

Response	Frequency
	total: 23
Not often-Never	20
Multiple per Week-Often	1
Once per Week-Sometimes	1
Multiple per Day-Everyday	1

Q5: Biking Destinations

Response	Frequency
	total: 3
Store	1
School	1
Work	1

Q5: Biking Reasons

Response	Frequency
	total: 11
Don't own a bike	6
No time	2
Recreation (Fun)	1
Own a car	1
Don't know how to ride a bike	1

Q6: Alley Use

Response	Frequency
	total: 22
Don't use	15
Shortcuts	1
Walking	3
No alleys in my neighborhood	1
Use alley behind my home	1
Parking	1

Q7: Alley Good Things

Response	Frequency
	total: 21
Nothing	16
Shortcuts	1
Parking	1
Neutral No opinion	1
Access (car)(Garage)	1
Convert to green spaces? (Low vehicular traffic, good for play)	1

Q:8 Alley Concerns

Response	Frequency
	total: 42
Yes (respondent has concerns)	11
No (respondent has no concerns)	8
Dirty (dumping, trash, debris, clothing, odor)	15
Unsafe/Dangerous/Gangs/Attacks/Mugging	8
Hazards/Poor Maintenance (unpaved, cracks, pot holes, trash, debris)	5
Poor Lighting	4
Vandalism / Graffiti	4
Drug use/dealing/Crime/Prostitutes/Murder	4
Loitering/Homeless(Bad / Creepy people)	1
Locked/Gated	1

Q9: Additional Comments

Response	Frequency
	total: 11
Would appreciate alleys getting cleaned up/Alleys need to be cleaned	5
Drug use	2
Homeless	1
Unsafe	1
Dangerous	1
Dumping happens	1
Impassible for vehicles	1
Many have locked gates	1
There are many kids there, selling drugs, using drugs, skipping class	1
Only thing worse than here is prison	1
Needs more police supervision	1
Spaces are too small	1
Should have more planting	1
Need lighting	1

Q1: Home Neighborhood

Response	Frequency
	total: 22
Florence	18
Historic South Central	2
Compton	1
Lakewood	1

Q1: Home Cross-Streets

Response	Frequency
	total: 3
Central & Century	1
Manchester & Vermont	1
95th St	1

Q2: Favorite Outdoor Spaces

Response	Frequency
	total: 35
Parks (Specific)	12
None	5
Backyard/Front porch/Home	4
Local parks (General)	2
Other (gym, downtown,work,mall)	8
Local streets	2
Beach	1
Library	1

Q2: Favorite Space Reason

Response	Frequency
	total: 8
Active (Exercise/Basketball)	2
Emotional ("Feel free")	2
Don't spend time outside	1
Open Space (fresh air)	1
Environment (Sun & shade)	1
Park is too far	1

Q3: Favorite Park Activities

Response	Frequency
	total: 28
Passive Recreation	10
Active Recreation	6
Solitary Activity	4
Play with kids/grandkids	4
Social Activity	3
Program (Dinosaur Exhibit)	1

Q4: Walking Frequency

Response	Frequency
	total: 12
Multiple per Day-Everyday	6
Not Often-Never	4
Multiple per Week-Often	2
Once per Week-Sometimes	0

Q4: Walking Destinations

Response	Frequency
	total: 28
Store	7
School	6
Friends'/Relatives' houses	5
Eat/Food/Restaurant	3
Library	2
Public Transportation (Bus)	2
Medical care	1
Shopping	1
Local Parks	1

Q4: Walking Reasons

Response	Frequency
	total: 4
Afraid of dogs	1
To be outside	1
Dirty	1
Unsafe	1

Q5: Biking Frequency

Response	Frequency
	total: 14
Never-Not often	12
Multiple per Week-Often	1
Once per Week-Sometimes	1
Multiple per Day-Everyday	0

Q5: Biking Destinations

Response	Frequency
	total: 5
Medical dispensary	1
Friends' houses	1
92nd Park	1
Store/Supermarket	2
Around neighborhood	1
USC	1

Q5: Biking Reasons

Response	Frequency
	total: 9
Don't own a bike	4
Bike will get stolen	1
Bike with kid	1
People watching/"cute girls"	1
Easy	1
Exercise	1

Q6: Alley Use

Response	Frequency
	total: 24
Don't use	15
Shortcuts	6
Infrequently	1
"Can't drive cars"	1
Walking	1

Q7: Alley Good Things

Response	Frequency
	total: 24
Nothing	10
Shortcuts	7
Car turn-around	2
Car Parking	2
Need a key/Locked	1
Safe	1
Maintained/Clean	1

Q:8 Alley Concerns

Response	Frequency
	total: 44
Yes (respondent has concerns)	19
No (respondent has no concerns)	2
Dirty (dumping, trash, debris, clothing, odor)	18
Unsafe/Dangerous/Gangs/Murder	17
Drug use/dealing/Crime/Criminals/Prostitutes	8
Homeless	7
Hazards/Poor Maintenance (unpaved, cracks, pot holes, trash, debris)	4
Unwanted activities (defecation, intoxicated people,dead animals, things thrown over fence)	4
Poor lighting/Poor visibility	4
Graffiti	2
Dogs (barking)	2
Gangs use them to escape	1

Q9: Additional Comments

Response	Frequency
	total: 21
Would appreciate alleys getting cleaned up/Alleys need to be cleaned	2
Lots of cameras	1
Women don't feel safe	1
Mother warns against using the alleys	1
Better to use main streets	1
People who live near are the only ones who should have keys to those alleys	1
Neighborhood watch lady distributes keys	1
Kids should not be in the alleys	1
Car got stuck & messed up in a pot hole	1
Not many homeless	1

Alleys Amplified: SLAGAMP 606 Cal Poly Pomona Jefferson HS Focus Group

Possible brief exercise to get the students to think about how they got to school that day...did they walk? Ride the bus? Drive? What was the weather like? What details did they notice from their journey? Etc... just to break the ice and get their minds focused on the outside environment/context.

1. **Group Discussions (25-30 minutes)**
   (Students will split into 2 groups for conversation. 606 Team will split up 2 per group with one person facilitating and one person taking notes)

   Can you tell us about this neighborhood?
   - What do you want to tell us about this neighborhood?
   - Where do you like to go?
   - What do you do?
   - How do you get around? Walk? Bicycle? Skate? Etc.
   - [Show of Hands] How many of you drive?
     - How many of you live in this neighborhood?
   - Where do you go after school? How do you get there? What do you do?
   - Where do you go to get out of the house?/Where do you hang out?

   How do you use the alleys in this neighborhood?
   - To get places? Activities?
   - How many people live next to an alley? What do you do there? Activities? To get places?
   - How many people have a garage on an alley? Does your family use the alley to access it?
   - What bugs you about the alleys? What issues are there? What do you dislike?
   - Are there good things about the alleys? What are they?

2. **Mapping (25-30 minutes)**
   (Students will break into groups of 4-5. Each group will mark up 2 separate maps with room to write around the borders. 606 Team will circulate to facilitate the activity and encourage students to write down their thoughts & ideas. Students will be given approximately 10 minutes for each map with a 2 minute warning before the exercise ends. Timing can be adjusted depending on group dynamics.)

   Map 1:
   - Draw the routes you take in this area. (try to keep lines next to each other, not on top)
   - Mark the places you LIKE to go/spend time with green stickers. Write down why you like them on the map.

   Map 2:
   - Mark the places you avoid with red stickers. Write down why you dislike them.
     Are there places (streets/alleys/etc.) that often have puddles or flooding? Mark them with blue stickers.

3. **Visioning (25-30 minutes)**
   (Each group gets flip chart paper. Take 3 minutes to sit and generate ideas, and write them down on post-it notes, then sticks the post-its on the flip chart paper. Exercise comes together as one big group calling out ideas as a 606 Team member writes them down for everyone to see. At that point, each student will get 5 stickers for votes in a "dot-mocracy" to identify the "best" ideas. This will give the 606 Team insight into the weight of preference among the students)

   What would make the alleys and the streets better in this neighborhood?

   Possible Prompts: How could you make it so more people want to walk or bike through alleys and along streets? How could we make this alley safer? How could we provide more recreation opportunities in this alley? (both active and passive) How could we make this alley more environmentally friendly?

4. **Wrap up (5 minutes)**
   (Students will write responses down on index cards and leave them behind for the 606 Team to collect)

   1. What activities bring your community together?
      What kinds of things happen that bring your community together?
   2. How do you organize with your friends?
      How do you communicate that you want to get together?
      How do you decide as a group to get together?
   3. Is there anything else you would like us to know?
      Would you like to share a memory of this neighborhood with us?

(606 Team will wrap up and thank the class for their time, pulling out specifics about how their ideas will help us with our work. We will leave our email address on the board for any student who might like to contact us in the future)

EXERCISE 1 GROUP DISCUSSION NOTES

Group A
Facilitator: Meagan
Recorder: Jana
Number of Students: 5 boys, 3 girls

Student in group who lives farthest away lives in Inglewood; his mom drives him to school
Other students live within walking distance of Jefferson High School.

Q: What do you want to tell us about this neighborhood?
A: It stinks, smells bad (students did not have much to say, started out quiet)

Q: Where do you like to go?
A: The Village, by USC (multiple students)
They walk or bike there (one student said it takes 2 hours to walk there, another said ½ hour)
At the Village, they go to the theater, Rose Garden

Q: How do you get around?
A: One said he skateboards
Most walk
One is learning to drive. Her dad has two cars, so she will get to use one of them.
Students ride bikes sometimes to most of the time.
No one takes the bus.

Q: Where do you go after school? What do you do?
A: Hang out, near school or at Ross Snyder
Tutoring at school

Q: Where do you go on the weekends? Where do you go to get out of the house?
A: The Village
UCLA to play basketball
Take the metro to Long Beach
Edwards Cinema by South Gate

Q: What do you call this neighborhood?
A: The ghetto
South Central

Q: How do you use the alleys in this neighborhood?
A: We don't use them - don't like to go through them
They are dangerous, especially after dark/after 7 pm. Sometimes dangerous during the day.

Q: What makes them dangerous? Why don't you use them?
A: Trash
Smell
Homeless people
Drug dealers
Gang bangers

Q: Would it make a difference to have lights?
A: Yes, maybe.
It would help the cops.

Q: How many people live next to an alley, or have a house that backs onto an alley?
A: Three

Q: What do you do there? How do you or your family use them?
A: Don't use them, maybe as a shortcut.
Ride bike through as a shortcut.
The alley is closed off, with gates up, and overgrown with plants.

Q: How are they closed off, are they locked?
A: Chained and locked.

Q: Does anyone have a key? Who has a key?
A: They give a key to everybody.
One student said his Dad uses the alley [to access the garage?]. He lives at 54th and Compton.
People use alleys to throw out their trash. If it's gated, they throw stuff over the gate.
People jump gates.

Q: What bugs you about the alleys?
A: Stinks - smells like pee.
Drunk people
Stinky diapers
Trash

Q: What's the craziest thing you've seen in an alley?
A: Dead animals
A passed out guy - thought he was dead.
Drunk guys peeing.
Drive-bys in the alley

Q: Are there any good things about the alleys?
A. NK.
Shortcuts. Will sometimes ride down on bike, if street is full with cars it's safer.

Q: What work have you guys done with the green alleys project?
A: Last year planted trees in neighbors' yards. Shortly after the trees were gone. Students think people said they wanted the trees [to be nice?], but didn't really want them.
Growing vegetables in the garden on campus.

Q: What sports do you play?
A: All of them
Basketball, football, kickboxing, soccer, skateboarding

Q: What do you see on your way to school?
A: Dirty
The same thing everyday.
Stray dogs.
Nothing. I don't look out the window.

Q: Do you see any murals?
A: Only one mural, over by the school.

Group B
Facilitator: Paul
Recorder: Linda
Number of Students: 4 girls, 3 boys

Q: Can you tell us about this neighborhood?
A: Like
Park (Ross Snyder) seems safer because livelier
A: Don't like
Boring, stay inside
4th(40th?)/Avalon different from Compton—east of Compton scary because of gangs
Within 4 block radius of school, school is the safest place to be
Dangerous because factory (between JHS and Ross Snyder) makes neighborhood feel more industrial than residential
Blue Line makes area seem lonelier (and more industrial) (5 blocks to Blue Line, to Long Beach, Imperial, Downtown)
Doesn't smell good
A: Transportation
1 out of the 6 students drive
Take bus a lot more—drops off closer to destination
Sees Metro & Bus as same level of safety—parents think Metro is more dangerous
A: After school
Stay on campus
Ross Snyder chained, safer
Summer night lights (Mayor's initiative); 2-3 months, park open until 10pm (midnight) every day; activities/programs (Wii, music playing, food)
1 x Like Gilbert-Lindsay
2 x Don't like Gilbert-Lindsay
There are homeless & gangsters

Q: How do you use the alleys in this neighborhood?
A: 1 student lived on a lot next to an alley, the house across the street also had alley
A: Did not need to access garage, was cut off from alley
Most people have driveways in front
One-story house was elevated so could see people walking in alley
A: 1/3 use alleys with cars
A: Safety depends from house to house
A: Alley pavement damaged and needs repair
A: Don't see people walk through alleys
A: People are selective of alleys
A: Alley by KFC is wider, more open, and seems safer
A: Recently installed lights on street, but not alleys
A: Existing lights are "old lights" (sodium lights) so streets are dim & very dark
Lack of good lighting makes neighborhood seem more industrial & not residential
A: Alleys described as "urban wildland"
A: Unless residents care, then other people don't care
A: Not a lot of eyes on the alley
A: Shorter fences in front yard of house
A: Residents shield themselves from the alleys because:
People use alleys to get away [escape]
Don't want people to see into their homes
A: Good things
Shortcuts for automobiles & walking
If well taken care of, good place to walk by & meet with friends
Shorter ones feel safer
A: 42nd—unsafe alley

PLACES YOU LIKE

EXERCISE 2 MAPPED RESPONSES

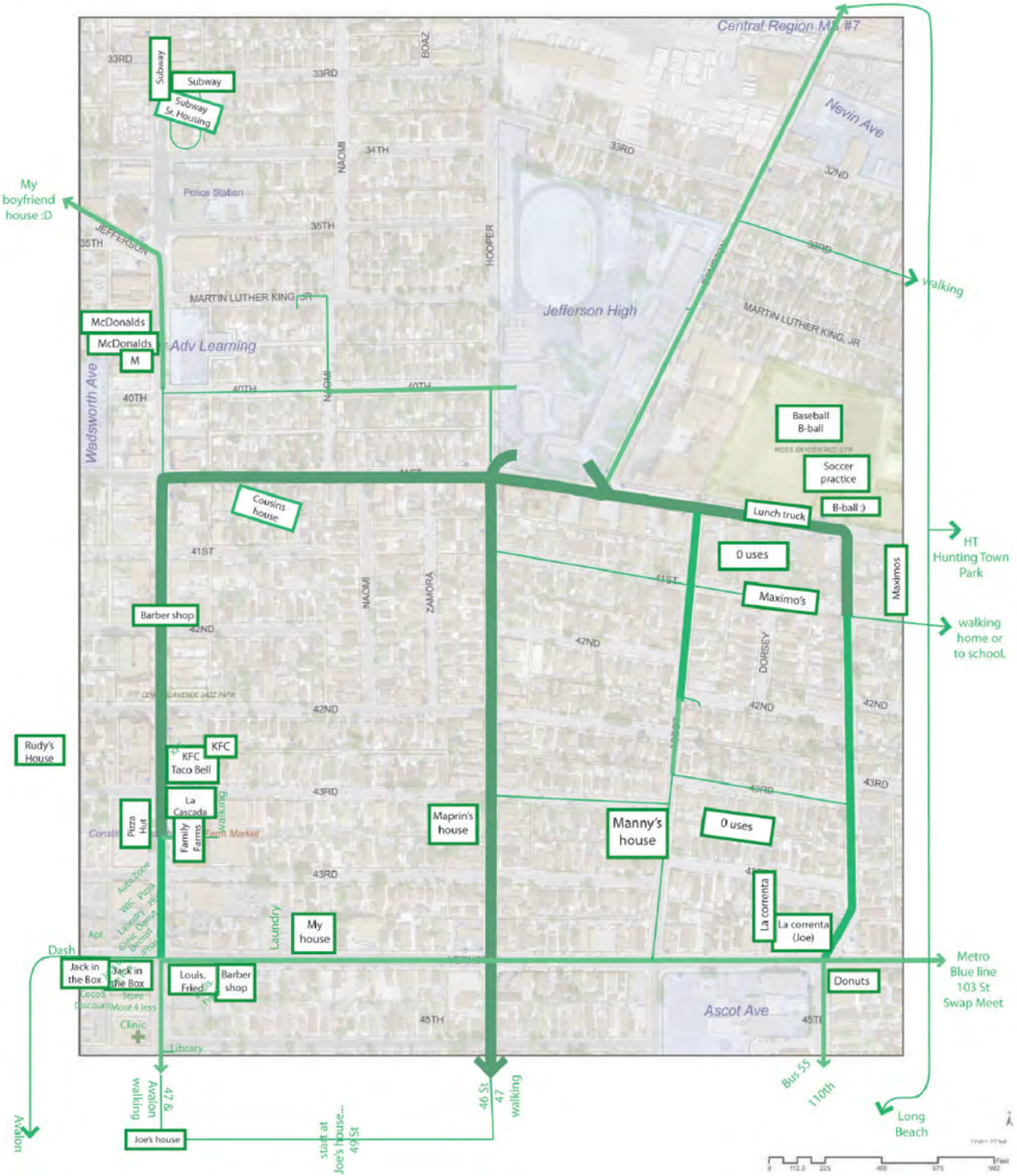


FIGURE G.1
PLACES YOU LIKE
COMBINED MAPPED RESPONSES

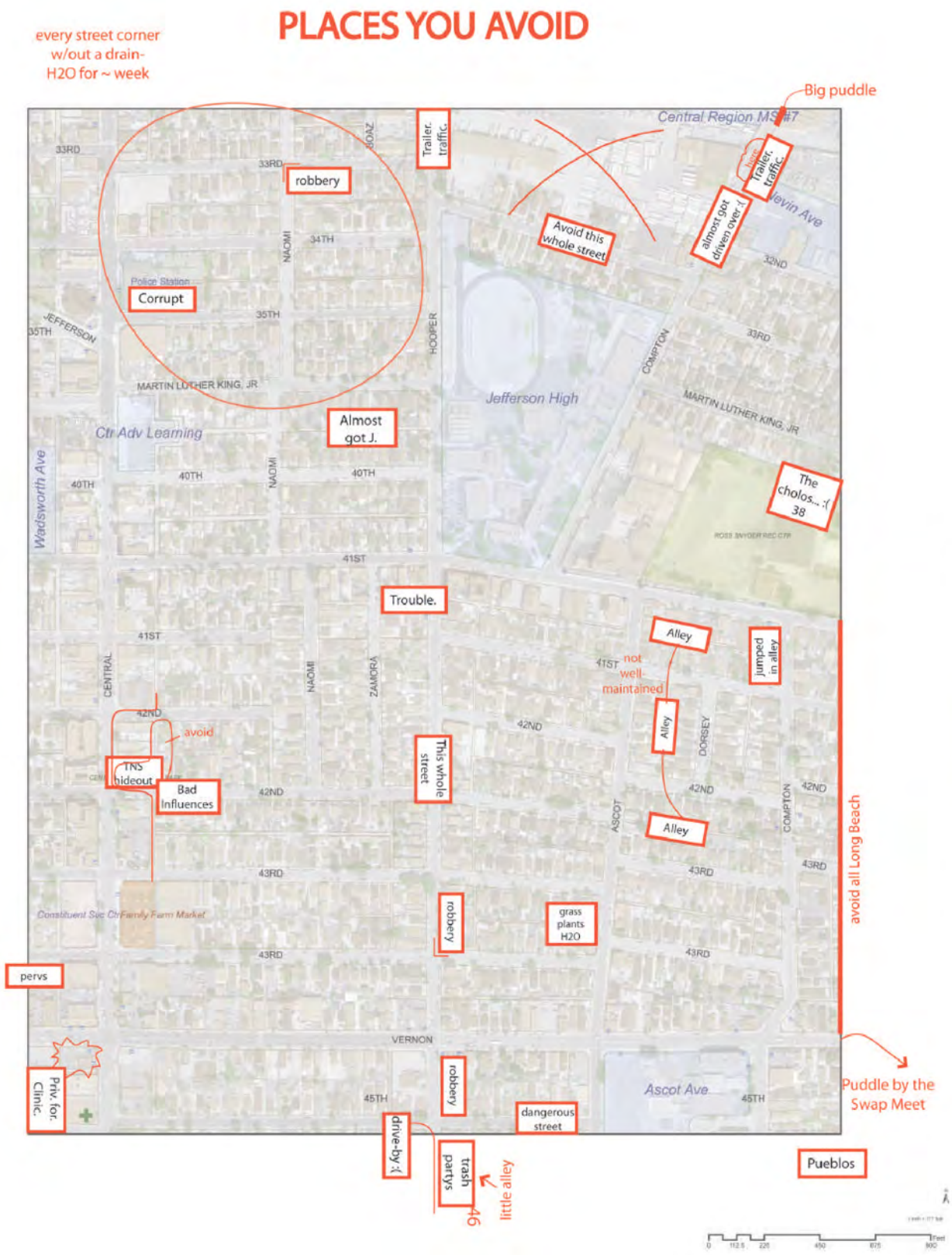


FIGURE G.2
PLACES YOU AVOID
COMBINED MAPPED RESPONSES

Group 1	
cameras	basketball, tag
pond	plants (flowers)
no cars	bathrooms/restrooms
grow grass	sidewalks
murals	water fountains
open on day and closed on night	lights
cleaning	trash cans
on the sides put grass, plants	repating walls
no writing/Graffiti	garden
lights on night safe	lights
flating the ground cover the holes	recycle bins
swingseats	jumprope
slide	security
tired swing	park
give the keys on the neighborhood	

Group 2	
solar panels	cameras
coloered light	murals
lights	LARGE trash containers
drains	trash cans/bins
maybe pavement, they should have signs to indicate possible shortcuts it could decrease the negativity surrounding them	bike lane on wide alley
Designated closing times, gets rid of malicious actions late at night	wider
weekly clean-ups	water barrels
water fence	portable potty's
cut grass/weeds	porta potties with chains
maintenance	solar panels
fine for dumping	

Group 3
well-lit
water catchment (cisterns underneath like Elmer St.)
shade
walkable
bikeable
zero trash
safe
more green places around the community
keep the streets clean
keep the park clean and green
go around and ask people how the feel about the alleys
to be able to clean the alleys
plant trees
cisterns
make sure the alley is a safe place to go through
plant trees on the alleys
more trash cans in the streets

Group 4	
pave the alleys	water fountain
light posts in the alleys	pathway
keep the alleys clean!	have some grass
trash cans close to alleys	make the alley more appealing
better lighting	stormwater gates
have the people surrounding keep alleys safe & clean	keep them cleaner & put gates or locks
maybe make them wider and put concrete	instead of tagging maybe gather up as a community and draw a mural
plant trees in the alley	re-paving of alleys
bioswales	solar panels
put benches	keep alleys clean

EXERCISE 3 DOT-MOCRACRY RESULTS

Jefferson High School Focus Group
Exercise 3 "Dot-mocracy"

Element	Votes
Lights	10
Weekley Cleanups	7
Murals	4
Benches	4
Cameras/Security	3
Trash Cans/Recycling/Compost	3
Fine for Dumping	3
Drinking Fountain	2
Plants/Flowers	2
Stormwater Grates	2
Repave	2
Bioswales	1
Solar Panels	1
Trees/Fruit Trees	0
Gates	0
Open/Close Hours	0
Port-a-Potty (chained)	0
Bike Lane	0
Slide/Swing set	0
Cisterns/Water Fence	0

EXERCISE 4 INDEX CARD RESPONSES

Alleys Amplified: SLAGAMP 606 Cal Poly Pomona Jefferson HS Focus Group

Exercise 4 Wrap Up: Index Card Responses – Direct Transcription

1. What activities bring your community together? What kinds of thing happen that bring your community together? (yellow card) **14 Respondents**
    a. Community fairs
    b. Certain donations
    c. Holidays
    d. Free food that church gives that is when the community comes together.
    e. School activities that bring families and community like activities.
    f. Fair
    g. Football season
    h. Sales
    i. One or some of the things that bring the community together is to recycle
    j. Helping one other
    k. Cyclinding things together
    l. What brings the community together is problems in the society because they need t discuss certain things out.
    m. Free stuff, community fairs, activities at schools or parks, informing people at schoo and involving adults in school
    n. Fairs
    o. Sales
    p. Football season
    q. Fairs
    r. Football season
    s. Sales
    t. Fairs
    u. Football season
    v. Fair
    w. Football season
    x. Sales
    y. Crisis, when bad things happen for example a major shooting or when Jeff was goin change into a charter school, students came together then parents came together.
    z. Community fairs if there is free stuff
    aa. It begins in school and then moves out to the community
    bb. Community fears
    cc. Parks, activities like competitions involving kids and adults people or games

2. How do you organize with your friends? How do you communicate that you want to get together? How do you decide as a group to get together? (orange card) **14 Respondents**
    a. Talk to each other after school, make plans and groups on who is doing what, or communicate with friends on Facebook or by email
    b. Texting
    c. Social website
    d. The way I communicate with my friends is by texting on Facebook or I call them
    e. We talk about our plan that we have
    f. We text to meet up together and then vote on what we are going to do (Democracy)
    g. Call
    h. Text
    i. Facebook
    j. Or at school and plan weekend or next day or that day
    k. Unexpected drop by's
    l. Video game messaging
    m. By drawing and showing notes what ideas they have and by listening other people what they have in main.
    n. I communicate with my friends by Facebook, texting and talking on the phone, especially by letters. Communication is my best thing.
    o. Calling
    p. Texting
    q. Facebook
    r. School
    s. Surprised unexpected dropbys
    t. Video game messaging
    u. Plan out a day before
    v. Have a person who know the place be the "leader"
    w. Call
    x. Text
    y. Facebook
    z. School in lunch
    aa. Video game messaging
    bb. You make it known, you go up to people and talk to them and tell them to spread the words.
    cc. Calling
    dd. Texting
    ee. Facebook
    ff. School planning for weekends
    gg. Unexpected dropbys
    hh. Videogame messaging
    ii. During school
    jj. Texting
    kk. Facebook
    ll. When random ideas come up and we share them
    mm. Talking during school and we make the desition on how many votes or which one they like the most
    nn. Facebook

3. Is there anything else you would like us to know? Would you like to share a memory of this neighborhood with us? (green card) **11 Respondents**
    a. People tend to tag things that are build in allys or parks
    b. I got a memory when they had shot a guy on my block and he tried to go on a alley but he couldn't it was a moment I won't forget.
    c. Not only restoring allies will make it better but involving and informing people. $ doesn't solve everything.
    d. Listening to the problems! of the people!!!
    e. Community is isolated. Not really communicative.
    f. Community communication none at all.
    g. Will I remember this time when I finished something of eating. After a while I was looking for a trascan and I didn't see not one around the streets that I walk through. So I tooked the trash to my house because I didn't wanted to throw it in the street.
    h. It would be nice to bring the neighborhood to life, like have it pop out.
    i. The community has little communication with each other.
    j. This community doesn't really interact with each other, except when someone gets killed or something like that.
    k. Not only do we need to repair the ally. But we need to make it known. In the sense that the entire school knows and the community it needs to come up public.
    l. Sometimes our community is judge and then they/people that judges our community judge us the way our community is. We tried to clean it up, but it does not work if we are not gather as a community.

South LA Green Alleys

Landscape Architecture, Cal Poly Pomona
3801 West Temple Blvd.
Pomona, CA 91768

We are gathering information about the alleys in South Los Angeles to identify possible areas where future green alleys might help improve your community. Your insights will help us recognize their potential. Thank you for your time.

Estamos recopilando información acerca de los callejones del sur de Los Ángeles, para identificar posibles áreas en donde futuros callejones verdes podrían ayudar a mejorar a la comunidad. Sus ideas nos ayudarán a reconocer su potencial. Gracias por su tiempo.

1. What are the nearest cross-streets to where you live?
¿Cuales son las calles transversales más cercanas de su casa?

2. What are your favorite outdoor spaces in your neighborhood?
¿Cuáles son sus espacios favoritos al aire libre en su barrio?

What do you like about them?
¿ Por qué le gustan?

3. What do you like to do in your favorite outdoor spaces?
¿Qué le gusta hacer en sus espacios favoritos al aire libre?

4. How often do you walk in your neighborhood?
¿Con qué frecuencia camina usted in su vecindario?

5. How often do you bicycle in your neighborhood?
¿Con qué frecuencia anda usted en bicicleta?

6. Do you use the streets and alleys in this area of the neighborhood (see map)?
¿Usa las calles y los callejones en esta zona del vecendario (mire el mapa)?

◯ Yes / *Sí*
◯ No / *No*

Please mark and label on the map the places you go.

Por favor marque en el mapa los lugares que va.



7. How do you use the alleys in your neighborhood?
¿Qué uso le da a los callejones en tu vecindario?

◯ I don't use the alleys. Explain why: / *No uso los callejones. Explique por qué:*
◯ I use them as follows: / *Los uso de la siguiente manera:*

_____ _____
_____ _____
_____ _____

8. Please describe the general condition of the alleys in your neighborhood.
Por favor, describa en general las condiciones de los callejones en tu vecindario.

_____ _____
_____ _____
_____ _____
_____ _____

9. What concerns do you have about the alleys in your neighborhood?
¿Qué inquietudes tiene acerca de los callejones en su vecindario?

_____ _____
_____ _____
_____ _____
_____ _____

10. Do you prefer the alleys to be gated or un-gated?
¿Prefiere los callejones enrejados o sin rejas?

◯ Gated & Locked/*Enrejado con llave*
◯ Gated & Unlocked/*Enrejado sin llave*
◯ Un-Gated/*Sin enrejado*
◯ No Preference/*Sin preferencia*

Why? *¿Por qué?*
_____
_____
_____

11. Who has the keys to the gates of the alleys in your neighborhood?
¿Quién tiene las llaves para las puertas de los callejones en tu vecindario?

_____ _____
_____ _____

13. Please mark the streets and alleys that have flooding or large puddles of water after it rains.
Por favor marque las calles y los callejones que tienen las inundaciones o grandes charcos después de la lluvia.



14. What activities bring your community together?

10. What would you like to be able to do in the alleys and streets in your neighborhood?
¿Qué le gustaría poder hacer en las calles y los callejones de su vecindario?

15. Is there anything else you would like us to know?
¿Hay algo más que le gustaría que supiéramos?

South LA Green Alleys

Landscape Architecture, Cal Poly Pomona
3801 West Temple Blvd.
Pomona, CA 91768

We are gathering information about the alleys in South Los Angeles to identify possible areas where future green alleys might help improve your community. Your insights will help us recognize their potential. Thank you for your time.

Estamos recopilando información acerca de los callejones del sur de Los Ángeles, para identificar posibles áreas en donde futuros callejones verdes podrían ayudar a mejorar a la comunidad. Sus ideas nos ayudarán a reconocer su potencial. Gracias por su tiempo.

1. What are the nearest cross-streets to where you live?
¿Cuales son las calles transversales más cercanas de su casa?

2. What are your favorite outdoor spaces in your neighborhood?
¿Cuáles son sus espacios favoritos al aire libre en su barrio?

What do you like about them?
¿ Por qué le gustan?

3. What do you like to do in your favorite outdoor spaces?
¿Qué le gusta hacer en sus espacios favoritos al aire libre?

4. How often do you walk in your neighborhood?
¿Con qué frecuencia camina usted in su vecindario?

5. How often do you bicycle in your neighborhood?
¿Con qué frecuencia anda usted en bicicleta?

6. Do you use the streets and alleys in this area of the neighborhood (see map)?
¿Usa las calles y los callejones en esta zona del vecendario (mire el mapa)?

◯ Yes / *Sí*
◯ No / *No*

Please mark and label on the map the places you go.

Por favor marque en el mapa los lugares que va.



7. How do you use the alleys in your neighborhood?
¿Qué uso le da a los callejones en tu vecindario?

◯ I don't use the alleys. Explain why: / *No uso los callejones. Explique por qué:*
◯ I use them as follows: / *Los uso de la siguiente manera:*

8. Please describe the general condition of the alleys in your neighborhood.
Por favor, describa en general las condiciones de los callejones en tu vecindario.

9. What concerns do you have about the alleys in your neighborhood?
¿Qué inquietudes tiene acerca de los callejones en su vecindario?

10. Do you prefer the alleys to be gated or un-gated?
¿Prefiere los callejones enrejados o sin rejas?

◯ Gated & Locked/*Enrejado con llave*
◯ Gated & Unlocked/*Enrejado sin llave*
◯ Un-Gated/*Sin enrejado*
◯ No Preference/*Sin preferencia*

Why? *¿Por qué?*

11. Who has the keys to the gates of the alleys in your neighborhood?
¿Quién tiene las llaves para las puertas de los callejones en tu vecindario?

12. Please mark the streets and alleys that have flooding or large puddles of water after it rains.

Por favor marque las calles y los callejones que tienen las inundaciones o grandes charcos después de la lluvia.



13. What activities bring your community together?

_____ _____

_____ _____

_____ _____

_____ _____

14. What would you like to be able to do in the alleys and streets in your neighborhood?

¿Qué le gustaría poder hacer en las calles y los callejones de su vecindario?

_____ _____

_____ _____

_____ _____

_____ _____

15. Is there anything else you would like us to know?

¿Hay algo más que le gustaría que supiéramos?

CODE	What are the nearest cross-streets to where you live?	What are your favorite outdoor spaces in your neighborhood? What do you like about them?	What do you like to do in your favorite outdoor spaces?
09_01	Western & Century	Van Ness park; track, walking trail	Sit, walk, read
09_02	Browning & Western	We don't have a lot, MLKing Park & Leimert Park are the closest.	I like to walk around and get fresh air, meet neighbors
09_03	Vermont & Normandie	Parque Richardson; I can take my kids there	To play with my kids
09_04	Sutro & Leimert	Stocker corridor; hiking on a trail near house, nature, green space	-
09_05	Bonsallo Ave & 23rd St	St James Park, Expo Park, Estrella Park; Center of neighborhood, Rose Garden & open space, Reclaimed land next to freeway	Sit/relax, people watch, lunch
09_06	Congress & 24th	fountain by hoover; lots of foot traffic	-
09_07	MLK & Vernon	do not use	-
09_08	Union & Hoover	parks; Green & I like the space for son to play basket	Play area, garden like to play w/son - dog friendly area is needed in area
09_09	Jefferson & Normandie	parks; can gather	walk, run, bike, walk my dog
09_10	30th & Hobart Blvd.	park; wish our parks were cleaner. I take my grandson out to the parks on the west side, I go outside my community a lot but would rather enjoy within my community	-
SUMMARY	some live outside defined NC boundary	Parks, Stocker corridor, fountain	sit/relax, walk, play with kids

CODE	How often do you walk in your neighborhood?	How often do you bicycle in your neighborhood?	Do you use the streets and alleys in this area?
09_01	very often	not much	-
09_02	twice a week	Children ride everyday	Yes
09_03	everyday	no	Yes
09_04	1 x week	1 x week	-
09_05	everyday	Everyday	No
09_06	very often	often	Yes
09_07	none	none	-
09_08	not often, but would like to do this more	not at all but would like to do so.	Yes
09_09	not very often, I go to the park to walk my dog.	not very often	-
09_10	was walking every morning with a friend for 1 hour	my daughter rides her bike 3 to 4 times a week in the neighborhood	-
SUMMARY	-	Youth more likely to ride bikes	4/10 gave mapped responses

CODE	How do you use the alleys in your neighborhood?	Please describe the general condition of the alleys in your neighborhood.	What concerns do you have about the alleys in your neighborhood?
09_01	I don't use the alleys	Some are decent, many are in poor shape, garbage	Too much trash, dead animals
09_02	Access Parking, Taking shortcuts	they are a little run down and need a little upkeep.	The maintenance of the roads, some are broken and some have weeds.
09_03	Muy Divertide (fun)	Muy limpios y muy seguros (very clean & very safe)	Ninguno (none)
09_04	as a shortcut	they are dirty, scarey & often closed	-
09_05	Decent - though we don't have many in my knoock(?)	-	-
09_06	I don't use the alleys - dangerous, disgusting	filled with garbage, broken pavement	vagrants
09_07	I don't use the alleys - no alleys	-	-
09_08	I don't use the alleys - no need, usually take main streets	There are none by my home, however all alleys in the area, all of which are in very poor conditions. Trash, potholes, dark.	-
09_09	I don't use the alleys - I've been told they are dangerous	illegal activity, terrible pot holes, unwelcoming, gated/locked	Safety, beautification
09_10	Moving something onto my property	okay to poor. Gates need to be painted	Dumping things over the gate.
SUMMARY	6/10 don't use; 4/10 use for property access, shortcut	poor, garbage, paving problems	-

CODE	Do you prefer the alleys to be gated or un-gated? Why?	Who has the keys to the gates of the alleys in your neighborhood?	Please mark the streets and alleys that have flooding or large puddles
09_01	un-gated; access for the community	N/A	-
09_02	Gated & unlocked	The units that park in alley should have keys. It's up to the managers of the units to provide the tenants.	-
09_03	que ahora so mas seguros que hantes ahora hay mas seguridad (safer now than before and more security)	todos los que viven dentro tienen llave (everyone on the block has a key)	-
09_04	un-gated; gated alleys collect trash	?	-
09_05	No preference	-	-
09_06	Un-gated	-	-
09_07	-	-	-
09_08	No preference	don't know	not familiar
09_09	Gated & Locked; safety reasons	unsure	-
09_10	Gated & Locked	majority of the neighbors	-
SUMMARY	3/10 gated, 3/10 un-gated, 3/10 no pref, 1/10 no response	3/10 don't know, 3/10 adjacent neighbors, 4/10 no response	-

CODE	What activities bring your community together?	What would you like to be able to do in the alleys and streets in your neighborhood?	Is there anything else you would like us to know?
09_01	Football, basketball, youth programs, street carnivals, children playing together	play kickball, walk, ride bikes/skateboards	go house to house or send email to get full support/suggestions from the community
09_02	I think the carnivals.	-	
09_03	-	-	no ninguno todo esta muy seguro por ahora (no, none. Everything's safe at the moment)
09_04	Festivals, rallys, art, hip hop	Watch Birds, Drink Tea, Sit in a hammock	How will you maintain revamped alleys? 2 were done that I know of & quickly turned sour within a year
09_05	Walking, action items - such as air and noise (oil wells), we and our neighbors plant our parking strips on Bonsallo Ave - great conversation starters	-	-
09_06	festivals	-	-
09_07	none	-	-
09_08	Events, fair, park space	-	-
09_09	Family carnivals, farmers markets, dog parks!!, parks, gardens!!	Community garden, parks, skate park, dog park	-
09_10	problems (i.e. problem with prostitution, break-ins)	make them pleasant to look at	-
SUMMARY	-	parks & recreation, aesthetics	outreach suggestion, maintenance question

CODE	What are the nearest cross-streets to where you live?	What are your favorite outdoor spaces in your neighborhood? What do you like about them?	What do you like to do in your favorite outdoor spaces?
20_01	Raymond & Normandie	-	-
20_02	Vermont & 54th	USC; provides recreational space & coffee shops	study
20_03	Hoover & King	park; spacious & clean	walk around
20_04	King & Figueroa	park & church; place to worship	relax
20_05	48th & Normandie	library park	walk & jog
20_06	Vermont & Hoover	none; don't have any thought on these	relax in front yard
20_07	Figueroa & 52nd Pl	There are no immediate open spaces in my vicinity. Griffith Park would be my favorite in the city; large open environment, hiking grounds, picnic areas	relax, hike, walk, sight see

CODE	How often do you walk in your neighborhood?	How often do you bicycle in your neighborhood?	Do you use the streets and alleys in this area?
20_01	Walk from the house to Normandie to Raymond & back twice a day	0	-
20_02	only to and from the bus stop	only to and from school. There are no bicycle lanes near my home.	-
20_03	often	not often	-
20_04	every day	-	-
20_05	2 times a week	I jog once a week	-
20_06	once a day	never	-
20_07	once or twice a month	I don't	-

CODE	How do you use the alleys in your neighborhood?	Please describe the general condition of the alleys in your neighborhood.	What concerns do you have about the alleys in your neighborhood?
20_01	I don't; The alley has been taken over by weeds & trees over grown	A tree has grown in the telephone wires behind my house in the alley	telephone services & overgrown weeds
20_02	I don't; No need: I use main streets to get in and out of my house.	A lot of graffitti (satanic symbols and messages)	unsafe
20_03	short cut	poor	safety & being clean
20_04	I don't	need cleaning most of the times	keep it clean & safe
20_05	Access to apt.	poor condition	flooding
20_06	I don't	very bad	dumping, dirty
20_07	I don't	poor	crime ridden, dirty, unusable

CODE	Do you prefer the alleys to be gated or un-gated? Why?	Who has the keys to the gates of the alleys in your neighborhood?	Please mark the streets and alleys that have flooding or large puddles
20_01	Gated & Locked; To keep strangers out of the alley for our safety	I do not know	-
20_02	Gated & Locked; People will be responsible for their own space	There are no gates	-
20_03	no preference	unknown	-
20_04	Un-gated	it's open all time	-
20_05	yes but it leads to a business	nobody	-
20_06	Gated & Locked; to keep our alley clean	no one	-
20_07	Gated & Locked; limit outside access	Don't know	-

CODE	What activities bring your community together?	What would you like to be able to do in the alleys and streets in your neighborhood?	Is there anything else you would like us to know?
20_01	-	47th St from Raymond to Vermont need to be paved	-
20_02	health fairs	enter with my car	please make survey shorter and in bubbles, especially for these types of meetings
20_03	parades & carnivals	have all access	no
20_04	swimming, baseball, summer at the park food for young kid	keep clean and use at needed	alleys can be used to help flow of traffic
20_05	church, neighborhood council, boys & girls club	avoid flooding	good idea - we need help on this area.
20_06	block party	clean them up	keep our alley clean
20_07	food, free merchandise	nothing	Alleys in this area aren't used in the same ways as the other neighborhoods. Due to higher levels of crimes and lower police patrolling alleys provide harbor for illegal activities.

1) AMP Overview Presentation (7 minutes)

a. Introduction
("Networks" as alleys & streets)
b. Benefits of alleys
(hydrology, open space, community connections)
c. Context
d. Biophysical + Sociocultural Inventory
e. Outreach + Precedent Studies
C. Project Status

2) Group Discussion (18 minutes)

As one group, Green Streets Committee members will receive a list of questions (attached) to be discussed. Questions include:

- Which existing City policies, programs, and initiatives support or hinder innovation in developing street and alley networks?
- What are the key obstacles to developing street and alley networks?
- What policies, programs, and initiatives are needed to support innovative street and alley networks?
- If time permits: Is there anything else you would like us to know related to street and alley networks?

3) List of Topics (4 minutes)

Green Streets Committee members will receive a list of topics (attached) and be asked to provide the names and contact information of those best able to answer questions related to each of the five topics. Topics include:

- Lights and Utilities in Streets and Alleys
- Closure/Decommissioning of Streets and Alleys
- Alley Gates and Fences
- Management/Maintenance of Streets and Alleys
- Stormwater BMPs

4) Conclusion & ThankYou (1 minute)

SOUTH LA GREEN ALLEYS MASTER PLAN
GREEN STREETS COMMITTEE MEETING

DISCUSSION

TRUST FOR PUBLIC LAND
CAL POLY POMONA - 606 STUDIO
DEPARTMENT OF LANDSCAPE ARCHITECTURE

1. Which existing City policies, programs, and initiatives support or hinder innovation in developing street and alley networks?

2. What are the key obstacles to developing street and alley networks?

3. What policies, programs, and initiatives are needed to support innovative street and alley networks?

4. Please add anything else you would like us to know related to street and alley networks (turn over if you need more room).

The City of Los Angeles Green Streets Committee meets on a monthly basis as an opportunity for representatives from different City departments and non-profit organizations to collaborate on the planning and construction of low impact development (LID) and other green infrastructure projects within city right-of-ways. City departments represented on the Committee include: Bureau of Engineering, Bureau of Sanitation, Bureau of Street Services, Department of Building and Safety, Department of City Planning, Department of Recreation and Parks, Department of Transportation, Department of Water and Power, and the Mayor's Office; non-profit organizations include: Council for Watershed Health, Green LA Coalition, Heal the Bay, North East Trees, Santa Monica Bay Restoration Commission, Tree People, and The Trust for Public Land; and the educational institutions with representatives include: the University of Southern California and Jefferson High School. The committee has developed design guidelines for green streets and green alleys, and has been involved with a number of green streets projects, including the Elmer Avenue Neighborhood Retrofit, the Oros Green Street, and the Riverdale Avenue Green Street.

The AMP authors consulted the committee's *Green Streets and Green Alleys Design Guidelines Standards* to determine the most appropriate approaches to stormwater management in the alleys and streets. Best management practices described include: urban canopy trees, vegetated swale, infiltration/flow-through planter, pervious pavement, infiltration trench, stormwater curb extensions, and curb inlets (City of Los Angeles Department of Public Works Bureau of Sanitation 2009).

The AMP authors also attended a Green Streets Committee meeting, which was attended by representatives from the Bureau of Engineering, Department of Building and Safety, Bureau of Sanitation, Bureau of Street Services, and Department of Water and Power, as well as the non-profit organizations Green LA Coalition, Northeast Trees, Tree People, and The Trust for Public Land. The AMP authors sought to understand the city policies that both help and hinder green alley and street projects through a series of group discussion questions posed to the committee. The AMP authors summarized the responses of the Green Streets Committee from this meeting which are presented here.

The following information resulted from the group discussion moderated by the AMP authors and faculty at the Green Streets Committee meeting. It is based on notes taken by AMP authors during the discussion, and reflects the team's best understanding of the speakers' intended message.

Insights + Design Recommendations

Stormwater

- Less traffic in alleys allows a greater potential to infiltrate stormwater than streets.
- Capture and infiltrate/filtrate stormwater from surrounding streets and sidewalks in the alleys.
- When redirecting surface stormwater, consider the storm drain system and flooding issues (keep the runoff within its stormdrain system to prevent overloading adjacent systems).
- Areas that lack stormwater infrastructure are a high priority for green alley projects.
- Infiltration BMPs should not be located in travel lanes of streets but should be located in alleys.
- Capturing runoff from rooftops may lead to more stormwater volume than alley BMPs can handle.
- Streets are designed to hold and convey stormwater during a capacity storm event. Be aware that redirecting surface water may negatively affect this ability.
- Infiltration cannot be done within ten feet of any foundation.
- Green streets and green alleys should function together. Alleys should not be redesigned in isolation.

Access

- Legally, alleys may not be closed to public access.
- Bollards must be removable (but can be locked if all adjacent property owners agree).
- Even if temporarily closed to vehicles (using bollards, etc.), alleys must have paving that can support vehicle traffic.
- If open to vehicles, alley must be wide enough so that design elements do not obstruct vehicle traffic (design elements should pose no risk of damage from vehicle collision).
- Alley redevelopment projects will result in the removal of existing illegal gates (neighbors must decide if they would rather have the green alley or keep their gate – which may be eventually removed anyway).

Maintenance + Funding

- Funding for maintenance is extremely limited.
- Some grant programs will not provide funding for road improvements.

Policies

Stormwater

- Infiltration must be ten feet above groundwater and ten feet away from any foundation, including garages.
- Stormwater surface flow directions in alleys are not provided on the stormdrain system maps.
- Providing stormwater surface flow directions for alleys on the stormdrain system maps will facilitate green alley project development.
- Standard Urban Stormwater Mitigation Plan (SUSMP) permits are required for projects 5,000 square feet and greater that change the ground surface.

Access

- It may be possible to pursue changing the use designation of alleys, either through decommissioning or the pedestrian plaza policy.
- If use is not changed, public vehicular access and use of alleys must be maintained.
- Alley gates should ultimately be removed (they have not yet been because there has been no pressure to do so).
- Alleys are public easements for public access. If public access is prevented, landowners have the right to take the property for private use.
- Temporary closure permits allow closure for a maximum of 30 days.
- Pilot Project permits will allow closure for up to a year, but they require more staff time and effort to administer.

Management + Maintenance Responsibility

- Currently, the Bureau of Street Services is responsible for alley paving and illegal dumping, and the Bureau of Sanitation is responsible for trash collection.
- A potential recommendation is to develop an approach for dump sites to accept waste for free from people who live in proximity to the site.
- Community groups or homeowners' associations can provide financial support for alley network improvement projects.
- Community groups or homeowners' associations can take on maintenance responsibilities.

Lighting

- The City will light alleys at a property owner's request, but the owner must pay a maintenance fee ($20-30/month).
- Community groups or homeowners' associations can share the expense of providing and maintaining lights in alleys.
- Proposition 218 creates assessment districts for maintenance of solar lights.

Trees

- City policy is a replacement ratio of 2:1 for tree removal; replacement does not have to be at the same site as the removal if there is not space for the extra trees.

Additional Partnerships

- Work with or otherwise involve the Water Replacement District.

SECONDARY COMMUNITY INPUT: OUTREACH MATERIALS

SIDEWALK SURVEY QUESTIONNAIRE

A survey questionnaire was generated for each alley network accompanied with a map of the alleys highlighted within that network. Below is an example of a survey in both English and Spanish, followed by maps for each alley network surveyed. Maps were created in both English and Spanish and one Spanish version is shown.

CENTRAL - JEFFERSON: PROPOSED GREEN ALLEY NETWORK SURVEY 2014

1. **Do you use the alleys in your neighborhood?**

   ☐ No *(go to question 2)* ☐ Yes *(fill in below)*

   a) **What do you usually do in the alleys?** *(Check all that apply)*
   - ☐ Walk, to get to a destination
   - ☐ Walk or Run, for exercise
   - ☐ Bike
   - ☐ Skateboard
   - ☐ Socialize
   - ☐ Other: _____

2. **Are there specific things you like about the alleys you use?**

   _____

   _____

3. **Are there specific concerns you have about the alleys in your neighborhood or reasons you do not use them?** *(Check all that apply)*
   - ☐ Desired features are not available
   - ☐ Safety concerns
   - ☐ Maintenance issues
   - ☐ Traffic (driving cars or parking)
   - ☐ Other: _____

4. **What is the nearest intersection to where you live)?**

   Primary Street: _____ & Cross Street: _____

5. **For how long have you lived in this community?** *(Check one)*

   ☐ Less than 1 year ☐ 1 to 5 years ☐ 5 to 10 years ☐ More than 10 years

6. **Please describe your household:**

   a) Number of household members: _____

   b) Do you have children? ☐ No ☐ Yes *(fill in below)*

   Number of children under 5 years: _____
   Number of children 5-12 years old: _____
   Number of children 13-18 years old: _____
   Do your children currently use the alleys? ☐ Yes ☐ No
   If the alleys were renovated, would you use them? ☐ Yes ☐ No

CENTRAL - JEFFERSON: PROPUESTA DE RED DE CALLEJONES VERDES 2014

1. **¿Usa los callejones en su vecindario?**

   ☐ No *(vaya a la pregunta 2)* ☐ Sí (Marque abajo todos los que apliquen)

   a) **¿Qué hace normalmente en los callejones?** (Marque abajo todos los que se aplica)
   - ☐ A pie, para llegar a un destino
   - ☐ Caminar o correr, para hacer ejercicio
   - ☐ Bicicleta
   - ☐ Patín
   - ☐ Socializar
   - ☐ Otra: _____

2. **¿Hay cosas específicas que le gustan de los callejones que utiliza?**

   _____

   _____

3. **¿Existen preocupaciones específicas que tiene sobre los callejones en su vecindario, o razones por que no los utiliza?** (Marque abajo todos los que se aplica)
   - ☐ Características deseadas no están disponibles
   - ☐ Preocupaciones de seguridad
   - ☐ Problemas de mantenimiento
   - ☐ Tráfico (coches o estacionamiento?
   - ☐ Otra: _____

4. **¿Cuál es la intersección más cercana a donde vive.**

   Calle principal: _____ y ¿la calle que cruza donde vives?: _____

5. **¿Por cuánto tiempo ha vivido en esta comunidad?** *(Marque uno)*

   ☐ Menos de 1 año ☐ 1 a 5 años ☐ 5 a 10 años ☐ Más de 10 años

6. **Por favor, describa su hogar:**

   a) Número de miembros de la familia: _____

   b) ¿Tiene hijos? ☐ No ☐ Sí *(marque abajo)*

   Número de niños menores de 5 años: _____
   Número de niños de 5 a 12 años: _____
   Número de niños de 13 a 18 años: _____
   ¿Sus hijos usan actualmente los callejones? ☐ Sí ☐ No
   ¿Si se renovaran los callejones, los usarían? ☐ Sí ☐ No

CENTRAL - JEFFERSON: PROPOSED GREEN ALLEY NETWORK SURVEY 2014

7. Which of these alleys do you use? (Draw the routes you take)



8. Is there an alley not shown here that you think would be good to renovate?

THE TRUST FOR PUBLIC LAND Parks for People – Los Angeles

VERMONT SQUARE: PROPOSED GREEN ALLEY NETWORK SURVEY 2014

7. Which of these alleys do you use? (Draw the routes you take)

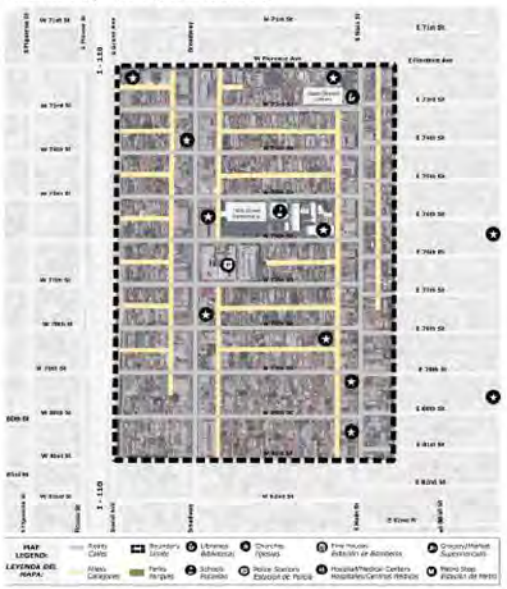


8. Is there an alley not shown here that you think would be good to renovate?

THE TRUST FOR PUBLIC LAND Parks for People – Los Angeles

'5TH - BROADWAY: PROPOSED GREEN ALLEY NETWORK SURVEY 2014

. Which of these alleys do you use? (Draw the routes you take)



. Is there an alley not shown here that you think would be good to renovate?

'HE TRUST FOR PUBLIC LAND Parks for People – Los Angeles

WESTERN - MLK: PROPUESTA DE RED DE CALLEJONES VERDES 2014

7. ¿Cuáles de estos callejones utiliza?



8. ¿Hay algún callejón que no se muestra aquí, y que usted piensa se debería renovar?

THE TRUST FOR PUBLIC LAND Parks for People – Los Angeles

QUINCY JONES: PROPOSED GREEN ALLEY NETWORK SURVEY 2014

. Which of these alleys do you use? (Draw the routes you take)



. Is there an alley not shown here that you think would be good to renovate?

THE TRUST FOR PUBLIC LAND Parks for People – Los Angeles

Participant Breakdown: where participants live

Response	# of Responses	% of Responses
1338 total survey respondents		
Unknowns, did not list location	279	21%
Do not live in AMP area	123	9%
Live in AMP area	936	70%
Live in AMP area, not in a network	418	31%
Live in AMP area, Phase I Networks	413	31%
Live in AMP area, Phase II Networks	105	8%
936 total respondents that live within the AMP area		
Live in AMP area, not in a network	418	31%
Live in AMP area, Phase I Networks	413	44%
Live in AMP area, Phase II Networks	105	11%

Q1: Do you use the alleys in your neighborhood?

Response	# of Responses	% of Responses
Yes	766	60%
No	510	40%
Total Responses/Respondents	1276	--

Q1a: What do you usually do in the alleys?

Multiple-choice Response	# of Responses	% of Responses	% of Respondents
Walk, to get to a destination	640	46%	67%
Walk or run, for exercise	240	17%	25%
Bike	145	10%	15%
Skateboard	61	4%	6%
Socialize	63	5%	7%
Vehicular use (write-in)	79	6%	8%
Other:	167	12%	17%
Total Responses	1395	--	--
Total Respondents	959	--	--

Q1: "Other" Responses

Write-in Response	# of Responses	% of Respondents
Access/passage, mode of transit unidentified	34	3%
Trash / utility related access	14	1%
Other activities	4	0%
Active / Passive recreation	16	2%
Dog walking	4	0%
N/A	101	10%
Total Responses	173	--
Total Respondents	973	--

Q2: Are there specific things you like about the alleys you use?

Write-in Response	# of Responses	% of Respondents
Passageway/Access	175	17%
Less vehicular traffic	14	1%
An open space	10	1%
Quiet, passive recreation	31	3%
Active recreation (running, etc.)	21	2%
Likes particular feature (aesthetic, layout, amenity, cleanliness)	55	5%
Answered 'No' and 'No' with a reason	565	55%
Other	26	3%
N/A , desires and dislikes	164	16%
Total Responses	1061	--
Total Respondents	1036	--

Q3: Are there specific concerns you have about the alleys.../ reasons you do not use them?

Multiple-choice Response	# of Responses	% of Responses	% of Respondents
Desired features are not available	3	0%	0%
Safety concerns	115	7%	9%
Maintenance issues	957	59%	73%
Traffic (driving cars or parking)	284	18%	22%
Other:	252	16%	19%
Total Responses	1611	--	--
Total Respondents	1306	--	--

***Note: For Q1 and Q2 Write-in Responses - Total Respondents are identified as those who responded to multiple-choice questions, plus the few additional respondents that bypassed the multiple-choice and only answered the write-in.

Q3. "Other" Responses

Write-in Response	# of Responses	% of Respondents
Illicit activities (drugs, alcohol, crime, violence, gangs)	72	6%
Trash/Dirty	79	6%
Homeless	13	1%
Pavement/Fence	6	0%
Appearance, general feeling about the alley	24	2%
Animals	7	1%
Graffiti	15	1%
NA/Unclear response	21	2%
Unsanitary/Health concerns	26	2%
Locked gates/Locked or no access	8	1%
Lighting/Security	22	2%
Vehicular safety concerns	5	0%
Total Responses	298	--
Total Respondents of Q3. Multiple-choice	1309	--

Q5: For how long have you lived in this community?

Response	# of Responses	% of Responses
Less than 1 year	108	8%
1 to 5 years	320	24%
5 to 10 years	301	23%
More than 10 years	579	44%
Total	1308	--b

Q6a: Please describe your household?

# of household members (TOTAL)	5607
Number of respondents	1269
Average #	4.418

Q6b: Do you have children & age range?

Response	# of Responses	% of Responses
Yes	744	59%
No	507	41%
Total Responses/ Respondents	1251	--

Children	Total	% Age Groups
# of children under 5 years	466	25%
# of children 5-12 years old	762	41%
# of children 13-18 years old	644	34%
Total	1872	--

Q6b: Do your children currently use the alleys?

Response	# of Responses	% of Responses
Yes	290	30%
No	689	70%
Total Responses/ Respondents	979	--

Q6b: If the alleys were renovated would you use them?

Response	# of Responses	% of Responses
Yes	427	88%
No	58	12%
Total Responses/ Respondents	485	--

Q1: Do you use the alleys in your neighborhood?

Response	# of Responses	% of Responses
Yes	162	60%
No	109	40%
Total Responses/ Respondents	271	--

Q1a: What do you usually do in the alleys?

Multiple-choice Response	# of Responses	% of Responses	% of Respondents
Walk, to get to a destination	124	51%	65%
Walk or run, for exercise	35	14%	18%
Bike	22	9%	12%
Skateboard	7	3%	4%
Socialize	11	5%	6%
Other:	45	18%	24%
Total Responses	244	--	--
Total Respondents	190	--	--

Q1: "Other" Responses

Write-in Response	# of Responses	% of Respondents
Vehicular use	13	7%
Access/passage, mode of transit unidentified	7	4%
Trash / utility related access	4	2%
Other activities	1	0%
Active / Passive recreation	3	2%
Dog walking	0	0%
N/A	13	7%
Total Responses	41	--
Total Respondents	191	

Q2: What are the specific things you like about the alleys you use?

Write-in Response	# of Responses	% of Respondents
Passageway/Access	31	15%
Less vehicular traffic	5	2%
Other	2	1%
An open space	1	0%
Quiet, passive recreation	11	5%
Active recreation (running, etc.)	1	0%
Likes particular feature (aesthetic, layout, amenity, cleanliness)	11	5%
Answered 'No' and 'No' with a reason	131	63%
N/A , desires and dislikes	18	9%
Total Responses	211	--
Total Respondents	208	--

Q3: Are there specific concerns you have about the alleys.../ reasons you do not use them?

Multiple-choice Response	# of Responses	% of Responses	% of Respondents
Desired features are not available	3	1%	1%
Safety concerns	76	22%	28%
Maintenance issues	207	61%	76%
Traffic (driving cars or parking)	52	15%	19%
Other:	4	1%	1%
Total Responses	342	--	--
Total Respondents	273	--	--

***Note: For Q1 and Q2 Write-in Responses - Total Respondents are identified as those who responded to multiple-choice questions, plus the few additional respondents that bypassed the multiple-choice and only answered the write-in.

Q4:"Other" Responses

Write-in Response	# of Responses	% of Respondents
Illicit Activities (drugs, alcohol, crime, violence, gangs)	18	7%
Trash/Dirty	21	8%
Homeless	2	1%
Pavement/Fence	2	1%
Appearance, general feeling about alley	4	1%
Animals	1	0%
Graffiti	4	1%
NA/Unclear Response	1	0%
Unsanitary/health concerns	5	2%
Locked gates/Locked or no access	1	0%
Lighting/Security	4	1%
Vehicular safety concerns	1	0%
Total Responses	64	--
Total Respondents	273	--

Q5: For how long have you lived in this community?

Response	# of Responses	% of Responses
Less than 1 year	20	7%
1 to 5 years	50	18%
5 to 10 years	65	24%
More than 10 years	140	1%
Total Responses/ Respondents	275	--

Q6a: Please describe your household?

# of household members (TOTAL)	1316
Number of Respondents	268
Average #	4.910

Q6b: Do you have children & age range?

Response	# of Responses	% of Responses
Yes	163	62%
No	100	38%
Total Responses/ Respondents	263	--

Children	Total	% Age Groups
# of children under 5 years	132	30%
# of children 5-12 years old	162	37%
# of children 13-18 years old	144	33%
Total	438	--

Q6b: Do your children currently use the alleys?

Response	# of Responses	% of Responses
Yes	67	33%
No	135	67%
Total Responses/ Respondents	202	--

Q6b: If the alleys were renovated would you use them?

Response	# of Responses	% of Responses
Yes	107	91%
No	11	9%
Total Responses/ Respondents	118	--

Q7: Which of these alleys do you use? (Draw the routes you take)

No survey participants completed this question.

Q8: Is there an alley not shown here that you think would be good to renovate?

Only responses that had enough information to be identifiable were included:

- Central Ave. / E. 47th St., Central Ave. / 108th St.
- Broadway / 64th St.
- Hooper Ave. / 41st St.
- Compton Ave. / 47th St., Compton Ave. / 51st St.
- 48th St. / Hooper Ave. - Ascot Ave.
- 55th St. / Central Ave. - Hoover Ave.
- McKinley Ave. / 41st St. - 41st Pl.
- Martin Luther King Jr. Blvd. / Maple St.
- Avalon Blvd. / 49th St.

Q1: Do you use the alleys in your neighborhood?

Response	# of Responses	% of Responses
Yes	162	62%
No	101	38%
Total Responses/ Respondents	263	--

Q1a: What do you usually do in the alleys?

Multiple-choice Response	# of Responses	% of Responses	% of Respondents
Walk, to get to a destination	150	50%	73%
Walk or Run, for exercise	60	20%	29%
Bike	35	12%	17%
Skateboard	11	4%	5%
Socialize	10	3%	5%
Other:	37	12%	18%
Total Responses	303	--	--
Total Respondents	206	--	--

Q1: "Other" Responses

Write-in Response	# of Responses	% of Respondents
Vehicular use	15	7%
Access/passage, mode of transit unidentified	8	4%
Trash / utility related access	3	1%
Other activities	1	0%
Active / Passive recreation	4	2%
Dog walking	1	0%
N/A	9	4%
Total Responses	41	--
Total Respondents	211	--

Q2: What are the specific things you like about the alleys you use?

Write-in Response	# of Responses	% of Respondents
Passageway/Access	41	21%
Less vehicular traffic	3	2%
An open space	4	2%
Quiet, passive recreation	6	3%
Active recreation (running, etc.)	5	3%
Likes particular feature (aesthetic, layout, amenity, cleanliness)	14	7%
Answered 'No' and 'No' with a reason	91	46%
Other	4	2%
N/A , desires and dislikes	36	18%
Total Responses	204	--
Total Respondents	199	--

Q3: Are there specific concerns you have about the alleys.../ reasons you do not use them?

Multiple-choice Response	# of Responses	% of Responses	% of Respondents
Desired features are not available	0	0%	0%
Safety concerns	3	1%	1%
Maintenance issues	203	78%	72%
Traffic (driving cars or parking)	55	21%	20%
Other:	0	0%	0%
Total Responses	261	--	--
Total Respondents	282	--	--

***Note: For Q1 and Q2 Write-in Responses - Total Respondents are identified as those who responded to multiple-choice questions, plus the few additional respondents that bypassed the multiple-choice and only answered the write-in.

Q4:"Other" Responses

Write-in Response	# of Responses	% of Respondents
Illicit Activities (drugs, alcohol, crime, violence, gangs)	9	3%
Trash/Dirty	13	5%
Homeless	4	1%
Pavement/Fence	0	0%
Appearance, general feeling about alley	2	1%
Animals	2	1%
Graffiti	8	3%
NA/Unclear Response	5	2%
Unsanitary/health concerns	4	1%
Locked gates/Locked or no access	1	0%
Lighting/Security	5	2%
Vehicular safety concerns	3	1%
Total Responses	56	--
Total Respondents	284	--

Q5: For how long have you lived in this community?

Response	# of Responses	% of Responses
Less than 1 year	29	10%
1 to 5 years	68	24%
5 to 10 years	49	18%
More than 10 years	134	48%
Total Responses/ Respondents	280	--

Q6a: Please describe your household?

# of household members (TOTAL)	1287
Number of Respondents	272
Average #	4.732

Q6b: Do you have children & age range?

Response	# of Responses	% of Responses
Yes	160	60%
No	105	40%
Total Responses/ Respondents	265	--

Children	Total	% Age Groups
# of children under 5 years	122	24%
# of children 5-12 years old	218	43%
# of children 13-18 years old	169	33%
Total	509	--

Q6b: Do your children currently use the alleys?

Response	# of Responses	% of Responses
Yes	78	36%
No	136	64%
Total Responses/ Respondents	214	--

Q6b: If the alleys were renovated would you use them?

Response	# of Responses	% of Responses
Yes	114	88%
No	15	12%
Total Responses/ Respondents	129	--

Q7: Which of these alleys do you use? (Draw the routes you take)

No survey participants completed this question.

Q8: Is there an alley not shown here that you think would be good to renovate?

Only responses that had enough information to be identifiable were included:

- Avalon Blvd. / 42nd St.
- Central Ave. / 40th St.
- Central Ave. / 29th St.
- McKinley Ave. / Vernon Ave.
- Washington Blvd. / Longwood Ave.
- Central Ave. / 29th St.

Q1: Do you use the alleys in your neighborhood?

Response	# of Responses	% of Responses
Yes	135	59%
No	95	41%
Total Responses/ Respondents	230	--

Q1a: What do you usually do in the alleys?

Multiple-choice Response	# of Responses	% of Responses	% of Respondents
Walk, to get to a destination	115	44%	70%
Walk or Run, for exercise	38	15%	23%
Bike	29	11%	18%
Skateboard	18	7%	11%
Socialize	13	5%	8%
Other:	46	18%	28%
Total Responses	259	--	--
Total Respondents	165	--	--

Q1: "Other" Responses

Write-in Response	# of Responses	% of Respondents
Vehicular use	13	8%
Access/passage, mode of transit unidentified	6	4%
Trash / utility related access	1	1%
Other activities	0	0%
Active / Passive recreation	1	1%
Dog walking	3	2%
N/A	23	14%
Total Responses	47	--
Total Respondents	167	--

Q2: What are the specific things you like about the alleys you use?

Write-in Response	# of Responses	% of Respondents
Passageway/Access	38	21%
Less vehicular traffic	0	0%
An open space	2	1%
Quiet, passive recreation	2	1%
Active recreation (running, etc.)	1	1%
Likes particular feature (aesthetic, layout, amenity, cleanliness)	5	3%
Answered 'No' and 'No' with a reason	89	49%
Other	3	2%
N/A , desires and dislikes	45	25%
Total Responses	185	--
Total Respondents	183	--

Q3: Are there specific concerns you have about the alleys.../ reasons you do not use them?

Multiple-choice Response	# of Responses	% of Responses	% of Respondents
Desired features are not available	0	0%	0%
Safety concerns	5	2%	2%
Maintenance issues	177	72%	76%
Traffic (driving cars or parking)	63	26%	27%
Other:	0	0%	0%
Total Responses	245	--	--
Total Respondents	233	--	--

***Note: For Q1 and Q2 Write-in Responses - Total Respondents are identified as those who responded to multiple-choice questions, plus the few additional respondents that bypassed the multiple-choice and only answered the write-in.

Q4:"Other" Responses

Write-in Response	# of Responses	% of Respondents
Illicit Activities (drugs, alcohol, crime, violence, gangs)	8	3%
Trash/Dirty	13	6%
Homeless	3	1%
Pavement/Fence	0	0%
Appearance, general feeling about alley	5	2%
Animals	1	0%
Graffiti	0	0%
NA/Unclear Response	5	5%
Unsanitary/health concerns	13	6%
Locked gates/Locked or no access	0	0%
Lighting/Security	5	2%
Vehicular safety concerns	0	0%
Total Responses	53	--
Total Respondents	234	--

Q5: For how long have you lived in this community?

Response	# of Responses	% of Responses
Less than 1 year	27	11%
1 to 5 years	60	25%
5 to 10 years	64	27%
More than 10 years	86	36%
Total Responses/ Respondents	237	--

Q6a: Please describe your household?

# of household members (TOTAL)	999
Number of Respondents	230
Average #	4.343

Q6b: Do you have children & age range?

Response	# of Responses	% of Responses
Yes	135	61%
No	87	39%
Total Responses/ Respondents	222	--

Children	Total	% Age Groups
# of children under 5 years	74	28%
# of children 5-12 years old	99	37%
# of children 13-18 years old	93	35%
Total	266	--

Q6b: Do your children currently use the alleys?

Response	# of Responses	% of Responses
Yes	47	26%
No	135	74%
Total Responses/ Respondents	182	--

Q6b: If the alleys were renovated would you use them?

Response	# of Responses	% of Responses
Yes	82	86%
No	13	14%
Total Responses/ Respondents	95	--



Q7: Which of these alleys do you use? (Draw the routes you take)

This question was completed by 14 out of 238 survey respondents. Alley use indicated by survey recipients is shown in the map at left using the following color ramp:

Low (1-2 users)

Medium (3-4 users)

High (5-6 users)

Q8: Is there an alley not shown here that you think would be good to renovate?

Only responses that had enough information to be identifiable were included:

- Florence Blvd. / Main St.
- Hoover St. / Gage St.
- Florence Blvd. / Broadway
- 73rd - 75th St. / Broadway - Main St.

FIGURE G.3
BROADWAY-75TH NETWORK FREQUENCY OF ALLEY USE INDICATED BY SURVEY RESPONDENTS

Q1: Do you use the alleys in your neighborhood?

Response	# of Responses	% of Responses
Yes	153	59%
No	108	41%
Total Responses/ Respondents	261	--

Q1a: What do you usually do in the alleys?

Multiple-choice Response	# of Responses	% of Responses	% of Respondents
Walk, to get to a destination	127	42%	64%
Walk or Run, for exercise	48	16%	24%
Bike	36	12%	18%
Skateboard	14	5%	7%
Socialize	18	6%	9%
Other:	60	20%	30%
Total Responses	303	--	--
Total Respondents	198	--	--

Q1: "Other" Responses

Write-in Response	# of Responses	% of Respondents
Vehicular use	17	8%
Access/passage, mode of transit unidentified	6	3%
Trash / utility related access	3	1%
Other activities	1	0%
Active / Passive recreation	5	2%
Dog walking	0	0%
N/A	29	14%
Total Responses	61	--
Total Respondents	204	--

Q2: What are the specific things you like about the alleys you use?

Write-in Response	# of Responses	% of Respondents
Passageway/Access	38	17%
Less vehicular traffic	3	1%
Other	7	3%
An open space	1	0%
Quiet, passive recreation	7	3%
Active recreation (running, etc.)	12	5%
Likes particular feature (aesthetic, layout, amenity, cleanliness)	12	5%
Answered 'No' and 'No' with a reason	126	55%
N/A , desires and dislikes	34	15%
Total Responses	240	--
Total Respondents	230	--

Q3: Are there specific concerns you have about the alleys.../ reasons you do not use them?

Multiple-choice Response	# of Responses	% of Responses	% of Respondents
Desired features are not available	0	0%	0%
Safety concerns	11	4%	4%
Maintenance issues	182	72%	69%
Traffic (driving cars or parking)	60	24%	23%
Other:	0	0%	0%
Total Responses	253	--	--
Total Respondents	262	--	--

***Note: For Q1 and Q2 Write-in Responses - Total Respondents are identified as those who responded to multiple-choice questions, plus the few additional respondents that bypassed the multiple-choice and only answered the write-in.

Q4:"Other" Responses

Write-in Response	# of Responses	% of Respondents
Illicit Activities (drugs, alcohol, crime, violence, gangs)	21	8%
Trash/Dirty	22	8%
Homeless	0	0%
Pavement/Fence	3	1%
Appearance, general feeling about alley	7	3%
Animals	2	1%
Graffiti	2	1%
NA/Unclear Response	5	2%
Unsanitary/health concerns	2	1%
Locked gates/Locked or no access	5	2%
Lighting/Security	5	2%
Vehicular safety concerns	1	0%
Total Responses	75	--
Total Respondents	263	--

Q5: For how long have you lived in this community?

Response	# of Responses	% of Responses
Less than 1 year	19	7%
1 to 5 years	81	31%
5 to 10 years	58	22%
More than 10 years	104	40%
Total Responses/ Respondents	262	--

Q6a: Please describe your household?

# of household members (TOTAL)	987
Number of Respondents	255
Average #	3.871

Q6b: Do you have children & age range?

Response	# of Responses	% of Responses
Yes	129	51%
No	124	49%
Total Responses/ Respondents	253	--

Children	Total	% Age Groups
# of children under 5 years	56	20%
# of children 5-12 years old	125	45%
# of children 13-18 years old	98	35%
Total	279	--

Q6b: Do your children currently use the alleys?

Response	# of Responses	% of Responses
Yes	50	27%
No	138	73%
Total Responses/ Respondents	188	--

Q6b: If the alleys were renovated would you use them?

Response	# of Responses	% of Responses
Yes	46	85%
No	8	15%
Total Responses/ Respondents	54	--

Q7: Which of these alleys do you use? (Draw the routes you take)

This question was completed by 6 out of 270 survey respondents. Alley use indicated by survey recipients is shown in the map at left using the following color ramp:

Low (1-2 users)

Q8: Is there an alley not shown here that you think would be good to renovate?

Only responses that had enough information to be identifiable were included:

- Exposition Blvd. / Western Ave.
- 39th St. / Denker Ave.
- Vermont Ave. / Vernon Ave.
- 39th St. / Western Ave.

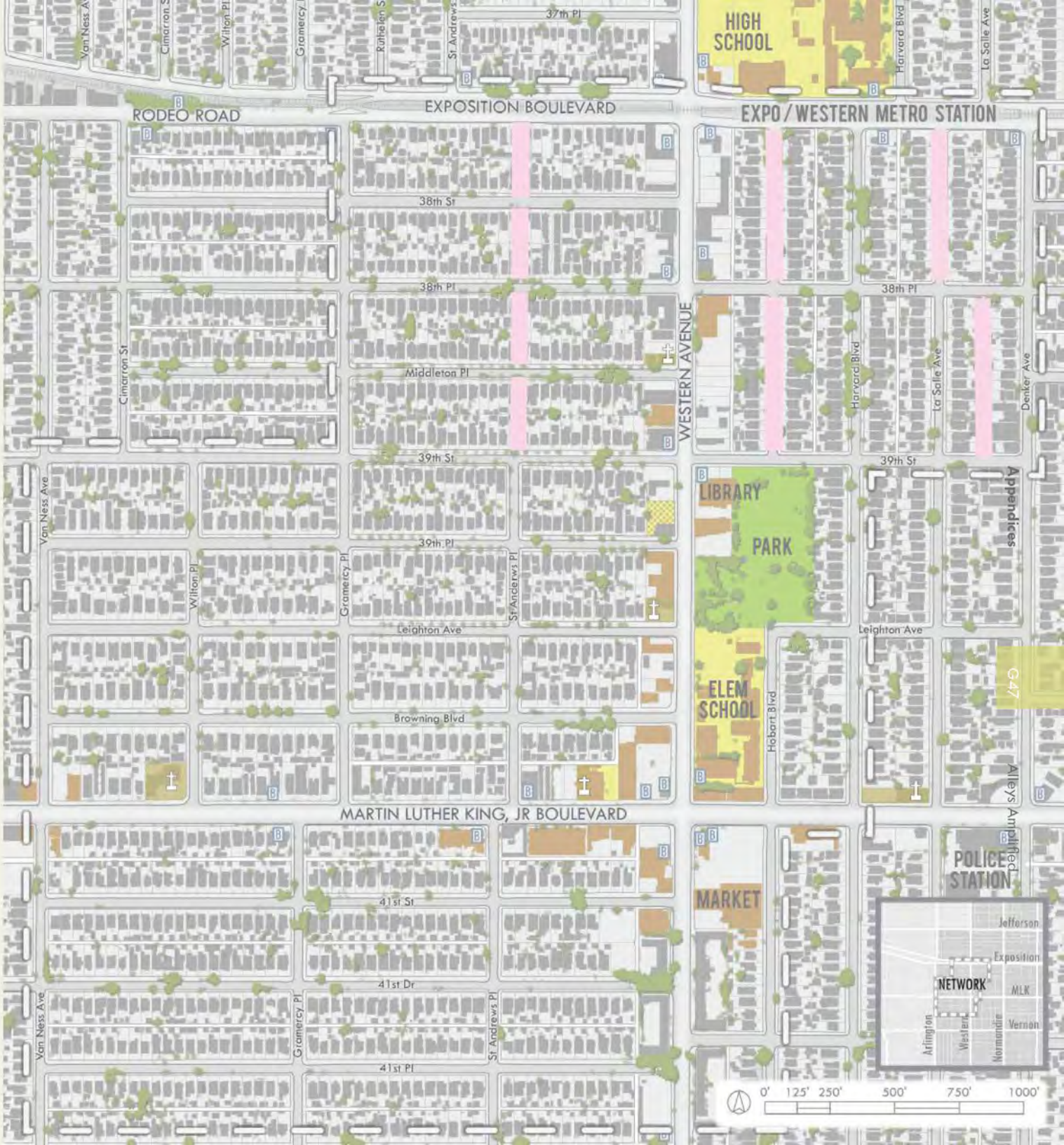


FIGURE G.4
WESTERN-MLK NETOWRK FREQUENCY OF ALLEY USE INDICATED BY SURVEY RESPONDENTS

Q1: Do you use the alleys in your neighborhood?

Response	# of Responses	% of Responses
Yes	154	61%
No	97	39%
Total Responses/ Respondents	251	--

Q1a: What do you usually do in the alleys?

Multiple-choice Response	# of Responses	% of Responses	% of Respondents
Walk, to get to a destination	124	43%	62%
Walk or Run, for exercise	59	21%	30%
Bike	23	8%	12%
Skateboard	11	4%	6%
Socialize	11	4%	6%
Other:	58	20%	29%
Total Responses	286	--	--
Total Respondents	200	--	--

Q1: "Other" Responses

Write-in Response	# of Responses	% of Respondents
Vehicular use	16	8%
Access/passage, mode of transit unidentified	7	4%
Trash / utility related access	3	2%
Other activities	1	1%
Active / Passive recreation	3	2%
Dog walking	0	0%
N/A	27	14%
Total Responses	57	--
Total Respondents	200	--

Q2: What are the specific things you like about the alleys you use?

Write-in Response	# of Responses	% of Respondents
Passageway/Access	27	13%
Less vehicular traffic	3	1%
An open space	2	1%
Quiet, passive recreation	5	2%
Active recreation (running, etc.)	2	1%
Likes particular feature (aesthetic, layout, amenity, cleanliness)	13	6%
Answered 'No' and 'No' with a reason	128	59%
Other	10	5%
N/A , desires and dislikes	31	14%
Total Responses	221	--
Total Respondents	216	--

Q3: Are there specific concerns you have about the alleys.../ reasons you do not use them?

Multiple-choice Response	# of Responses	% of Responses	% of Respondents
Desired features are not available	0	0%	0%
Safety concerns	20	8%	8%
Maintenance issues	188	72%	74%
Traffic (driving cars or parking)	54	21%	21%
Other:	0	0%	0%
Total Responses	262	--	--
Total Respondents	255	--	--

***Note: For Q1 and Q2 Write-in Responses - Total Respondents are identified as those who responded to multiple-choice questions, plus the few additional respondents that bypassed the multiple-choice and only answered the write-in.

Q4:"Other" Responses

Write-in Response	# of Responses	% of Respondents
Illicit Activities (drugs, alcohol, crime, violence, gangs)	16	6%
Trash/Dirty	10	4%
Homeless	4	2%
Pavement, fence	1	0%
Appearance, general feeling about alley	6	2%
Animals	1	0%
Graffiti	1	0%
NA/Unclear Response	5	2%
Unsanitary/health concerns	2	1%
Locked gates/clocked or no access	1	0%
Lighting/Security	3	1%
Vehicular safety concerns	0	0%
Total Responses	50	--
Total Respondents	255	--

Q5: For how long have you lived in this community?

Response	# of Responses	% of Responses
Less than 1 year	13	5%
1 to 5 years	61	24%
5 to 10 years	65	26%
More than 10 years	115	45%
Total Responses/ Respondents	254	--

Q6a: Please decribe your household?

# of household members (TOTAL)	1018
Number of Respondents	244
Average #	4.172

Q6b: Do you have children & age range?

Response	# of Responses	% of Responses
Yes	157	63%
No	91	37%
Total Responses/ Respondents	248	--

Children	Total	% Age Groups
# of children under 5 years	82	22%
# of children 5-12 years old	158	42%
# of children 13-18 years old	140	37%
Total	380	--

Q6b: Do your children currently use the alleys?

Response	# of Responses	% of Responses
Yes	48	25%
No	145	75%
Total Responses/ Respondents	193	--

Q6b: If the alleys were renovated would you use them?

Response	# of Responses	% of Responses
Yes	78	88%
No	11	12%
Total Responses/ Respondents	89	--



Q7: Which of these alleys do you use? (Draw the routes you take)

This question was completed by 9 out of 260 survey respondents. Alley use indicated by survey respondents is shown in the map at left using the following color ramp:

Low (1-2 users)

Medium (3-4 users)

Q8: Is there an alley not shown here that you think would be good to renovate?

Only responses that had enough information to be identifiable were included:

- Vermont Ave. / 66th St.
- Vermont Ave. / Martin Luther King Jr. Blvd.
- Vermont Ave. / 47th St.
- Central Ave. / 52nd St.
- Broadway / Imperial Hwy.
- Exposition Blvd. / Western Ave.

FIGURE G.5
VERMONT SQUARE NETWORK FREQUENCY OF ALLEY USE INDICATED BY SURVEY RESPONDENTS

Alleys seem faster to get to a destination.

Sidewalk Survey Participant, 2014

OUTREACH MATERIALS: WALKING INVENTORY PHOTOGRAPHS

WALKING INVENTORY QUESTIONNAIRE

A walking inventory questionnaire was generated for each alley network accompanied with a photograph log sheet for use with provided disposible cameras. Below is an example of a survey in both English and Spanish, followed by a photography log sheet.

Green Alley Master Plan
Walking Inventory

The Trust for Public Land
75TH - Broadway Alley Segment # 2

IN THE ALLEY	YES	NO	COMMENTS
1. Is the condition of the alley good? (explain response)			
Is the alley paved, concrete or dirt?			
Does the vegetation growing in the alley appear to be maintained?			
Is the alley clean?			
2. How are the properties adjacent to the alley? (explain response)			
Are there sufficient fences/walls?			
Are the fences/walls in good condition?			
Are there vacant lots/un-used spaces?			
3. Is there other traffic in the alley?			
Are there cars/other vehicles driving through the alley?			
Are other people out walking? If so, how many?			
4. Is the alley comfortable to walk along? (explain response)			
Are there locations with broken, uplifted or uneven paving or surfacing?			
Are there improvements that are needed to make the alley easier to walk on?			
5. Does the alley feel comfortable to walk through? (explain response)			
Are there any unpleasant conditions (dogs barking, smells, etc.)?			
Are there obstructions (trash, poles, utilities, etc.) within the alley?			
Does the alley feel safe to walk through?			
Are there improvements that are needed to make the alley feel safer?			
SPECIAL CHARACTERISTICS	**YES**	**NO**	**COMMENTS**
1. Is there any art work in or around the alley (murals, sculptures, etc.)			
Are there any special plants in or around the alley?			
Are there any other interesting characteristics in this alley segment? (Please describe)			

04/22/2014

Adapted from Deborah Murphy

WALKING INVENTORY QUESTIONNAIRE

Green Alley Master Plan

Walking Inventory

The Trust for Public Land

75TH - Broadway Alley Segment # 2

CROSSING FROM ALLEY TO THE STREET	YES	NO	COMMENTS
1. Does it feel safe to cross the street from the alley? (explain response)			
Is there a marked crosswalk?			
Is there signage to warn motorists of pedestrian crossing?			
Do drivers yield to pedestrians when appropriate?			

OVERALL RATING OF ALLEY EXPERIENCE (circle your answer choice)						
Overall rating of your sense of safety walking in the alley	1 = AWFUL	2 = MANY PROBLEMS	3 = SOME PROBLEMS	4 = GOOD	5 = VERY GOOD	6 = EXCELLENT
Overall rating of your sense of comfort walking in the alley	1 = AWFUL	2 = MANY PROBLEMS	3 = SOME PROBLEMS	4 = GOOD	5 = VERY GOOD	6 = EXCELLENT
Overall rating of alley maintenance	1 = AWFUL	2 = MANY PROBLEMS	3 = SOME PROBLEMS	4 = GOOD	5 = VERY GOOD	6 = EXCELLENT
Overall rating of your experience walking in the alley	1 = AWFUL	2 = MANY PROBLEMS	3 = SOME PROBLEMS	4 = GOOD	5 = VERY GOOD	6 = EXCELLENT
Overall rating of your experience crossing the street	1 = AWFUL	2 = MANY PROBLEMS	3 = SOME PROBLEMS	4 = GOOD	5 = VERY GOOD	6 = EXCELLENT

ADDITIONAL COMMENTS (KEY ISSUES)

04/22/2014

Adapted from Deborah Murphy

WALKING INVENTORY PHOTOGRAPHY LOG SHEET

Green Alley Master Plan
Photo Inventory

The Trust for Public Land
75th – Broadway Alley Segment # 2

PLEASE RECORD ALL PHOTOGRAPHS TAKEN IN ORDER. MARK THE LOCATION ON THE MAP WITH A NUMBER AND WRITE A DESCRIPTION OF THE PHOTO NEXT TO THE CORRESPONDING NUMBER BELOW.

DESCRIPTION OF PHOTOGRAPHS TAKEN
1.
2.
3.
4.
5.
6.
7.
8.
9.
10.
11.
12.

WALKING INVENTORY QUESTIONNAIRE (SPANISH)

Green Alley Master Plan

Inventario a pie

The Trust for Public Land

Callejón Vermont Square Segmento # 2

EN EL CALLEJON	SI	NO	COMENTARIOS
1. ¿El callejón está en buena condición? (explique su respuesta)			
¿El callejón está empedrado, pavimentado, o es pura tierra?			
¿Parece que la vegetación creciendo en el callejón está bien			
mantenida/cuidada?			
¿El callejón está limpio?			
2. ¿Cómo están la propiedades al lado del callejón ? (explique su respuesta)			
¿Hay suficientes cercas/paredes?			
¿Las cercas/paredes están en buena condición?			
¿Hay terreno baldío/espacios vacíos?			
3. ¿Hay tráfico en el callejón?			
¿Hay carros u otros vehículos pasando por el callejón?			
¿Hay otras personas caminando en el callejón? ¿Cuántas?			
4. ¿El callejón es cómodo para caminar? (explique su respuesta)			
¿Hay partes con pavimento quebrado, levantado, o disparejo?			
¿Hay improvisamientos o mejoras necesarias para que el callejón			
sea más fácil de caminar?			
5. ¿Se siente cómodo al caminar en el callejón? (explique su respuesta)			
¿Hay condiciones desagradables (perros ladrando, mal olor, etc.)?			
¿Hay obstrucciones (basura, postes, utilidades, etc.) en el callejón?			
¿El callejón se siente seguro para caminar?			
¿Hay improvisamientos o mejoras necesarias para que el callejón se			
sienta más seguro?			
CHARACTERISTICAS ESPECIALES	**SI**	**NO**	**COMENTARIOS**
1. ¿Hay arte en o al rededor del callejón (murales, esculturas, etc.)			
¿Hay plantas especiales en o al rededor del callejón?			
¿Hay otras características interesantes en este segmento del			
callejón? (por favor describa)			

04/22/2014

Adapted from Deborah Murphy

WALKING INVENTORY QUESTIONNAIRE (SPANISH)

Green Alley Master Plan

Inventario a pie

The Trust for Public Land

Callejón Vermont Square Segmento # 2

CRUSANDO DEL CALLEJON A LA CALLE	SI	NO	COMENTARIOS
1. ¿Se siente seguro al cruzar del callejón a la calle? (explique su respuesta)			
¿Hay un cruce peatonal marcado?			
¿Hay letreros para advertir a los automovilistas del paso de peatones?			
¿Los conductores ceden paso a los peatones?			

CLASIFICACION GENERAL DE SU EXPERIENCIA EN EL CALLEJON (CIRCULE SU RESPUESTA)	
Clasificación general de su sensación de seguridad en el callejón	1 = HORRIBLE 2 = MUCHOS PROBLEMAS 3 = ALGUNOS PROBLEMAS 4 = BUENO 5 = MUY BUENO 6 = EXCELENTE
Clasificación general de su sensación de comodidad en el callejón	1 = HORRIBLE 2 = MUCHOS PROBLEMAS 3 = ALGUNOS PROBLEMAS 4 = BUENO 5 = MUY BUENO 6 = EXCELENTE
Clasificación general del mantenimiento del callejón	1 = HORRIBLE 2 = MUCHOS PROBLEMAS 3 = ALGUNOS PROBLEMAS 4 = BUENO 5 = MUY BUENO 6 = EXCELENTE
Clasificación general de su experiencia caminando en el callejón	1 = HORRIBLE 2 = MUCHOS PROBLEMAS 3 = ALGUNOS PROBLEMAS 4 = BUENO 5 = MUY BUENO 6 = EXCELENTE
Clasificación general de su experiencia cruzando la calle	1 = HORRIBLE 2 = MUCHOS PROBLEMAS 3 = ALGUNOS PROBLEMAS 4 = BUENO 5 = MUY BUENO 6 = EXCELENTE

COMETARIOS ADICIONALES (TEMAS CLAVES)

04/22/2014

Adapted from Deborah Murphy

WALKING INVENTORY PHOTOGRAPHY LOG SHEET (SPANISH)

Green Alley Master Plan
Inventario de fotos

The Trust for Public Land
Callejón 75th – Broadway Segmento # 2

POR FAVOR ANOTE TODAS LAS FOTOS EN EL ORDEN EN QUE FUERON TOMADAS. INDIQUE LA LOCALIDAD EN EL MAPA CON UN NÚMERO Y REGISTRE UNA DESCRIPCIÓN DE LA FOTO JUNTO AL NÚMERO CORRESPONDIENTE ABAJO

DESCRIPCION DE FOTOS TOMADAS
1.
2.
3.
4.
5.
6.
7.
8.
9.
10.
11.
12.

04/22/2014

Adapted from Deborah Murphy

WALKING INVENTORY PHOTOGRAPH CONTENT ANALYSIS

Walking Inventory photographs were archived by alley network and segment. Later, the contents of the images were coded and analyzed using a threshhold of not less than 80% blind intercoder agreement for any photo characterisitc.

Green Alley Walking Inventory Photograph Content Coding

1

Network and Alley Segment	Image	Description	DOGS	BIOHAZARD	ILL. ACTIVITY	SIGNAGE	BAD ODOR	AUTOS / PARKING	PAVING	GRAFFITI	FENCE / STRUCT.	DAMAGE	VEGETATION	NEG. VEGETAION	MURAL	TRASH	HOMELESS	ALLEY ENTRANCE	ALLEY GATE	PEDESTRIAN	LIGHTING	SAFETY ISSUE
Western – MLK Segment 1		painted ground							1													
Western – MLK Segment 1		graffiti, fence, needs some kind of light	1								1										1	
Western – MLK Segment 1		middle alley, more graffiti								1												

FIGURE G.6
PHOTOGRAPH CONTENT ANALYSIS SAMPLE

OUTREACH MATERIALS: WALKING INVENTORY PHOTOGRAPHS

75TH + BROADWAY, SEGMENT 1









75TH + BROADWAY, SEGMENT 2

















75TH + BROADWAY, SEGMENT 2 (CONTINUED)





CENTRAL + JEFFERSON, SEGMENT 1






















OUTREACH MATERIALS: WALKING INVENTORY PHOTOGRAPHS

CENTRAL + JEFFERSON, SEGMENT 2

















QUINCY JONES, SEGMENT 1













QUINCY JONES, SEGMENT 1 (CONTINUED)





QUINCY JONES, SEGMENT 2























OUTREACH MATERIALS: WALKING INVENTORY PHOTOGRAPHS

VERMONT SQUARE, SEGMENT 1


























OUTREACH MATERIALS: WALKING INVENTORY PHOTOGRAPHS

VERMONT SQUARE, SEGMENT 2









WESTERN + MLK, SEGMENT 1










OUTREACH MATERIALS: WALKING INVENTORY PHOTOGRAPHS

WESTERN + MLK, SEGMENT 2














We would appreciate alleys getting cleaned up.

Sidewalk Survey Participant, 2012

APPENDIX H

NETWORK SELECTION SCORES

Network Numeric Code	Runoff Volume	Pollution Levels	Connectivity	Park Poverty	Network Score
1	2	2.5	2	4	10.5
2	3	2.5	3	4	12.5
3	3	1.9	2	5	11.9
4	3.5	1.9	2.5	4	11.9
5	2	2.5	1	5	10.5
6	4	3.1	3	4	14.1
7	3	2.5	1.5	5	12.0
8	2	2.5	1	5	10.5
9	2	2.5	4.5	3	12.0
10	3	2.5	2	4	11.5
11	3.5	2.5	2.5	3	11.5
12	2	2.5	1	5	10.5
13	3	3.1	1.5	5	12.6
14	3	2.5	1	5	11.5
15	4	1.9	2	4	11.9
16	5	3.1	2	5	15.1
17	3	2.5	1	5	11.5
18	3	2.5	2	5	12.5
19	2	2.5	2	5	11.5
20	2	2.5	4	3	11.5
21	4	3.1	1	4	12.1
22	2	2.5	1	4	9.5
23	3	2.5	2	5	12.5
24	2	2.5	2.5	5	12.0
25	3	3.1	2.5	5	13.6
26	3	3.1	2.5	1	9.6
27	4	3.1	3	4	14.1
28	4	2.5	2.5	4	13.0
29	4	3.1	3	4	14.1
30	5	5.0	1	5	16.0
31	5	5.0	1	5	16.0
32	4	3.8	2	4	13.8
33	3.5	3.1	2.5	4	13.1
34	4	3.1	4	4	15.1

Network Numeric Code	Runoff Volume	Pollution Levels	Connectivity	Park Poverty	Network Score
35	4	3.8	1	5	13.8
36	4	3.8	2	5	14.8
37	4	3.8	3	5	15.8
38	3.5	3.1	2.5	5	14.1
39	4	3.8	2	5	14.8
40	4	3.1	1.5	5	13.6
41	3.5	2.5	2.5	3	11.5
42	3.5	2.5	2	4	12.0
43	4	3.1	5	4	16.1
44	3	2.5	2	3	10.5
45	4	2.5	1	4	11.5
46	4	4.4	1	5	14.4
47	4	3.1	1	5	13.1
48	4	3.1	2.5	5	14.6
49	4	3.1	3.5	3	13.6
50	4	3.1	2.5	5	14.6
51	3.5	2.5	2.5	5	13.5
52	4	3.1	2	4	13.1
53	3.5	3.1	2	5	13.6
54	3.5	3.1	3	3	12.6
55	3.5	3.1	1.5	3.5	11.6
56	4	3.8	3	3	13.8
57	4	3.8	1	4	12.8
58	4	3.1	1.5	4.5	13.1
59	3.5	3.1	3	5	14.6
60	3.5	3.1	2	5	13.6
61	3.5	3.1	2.5	5	14.1
62	3.5	3.1	3	5	14.6
63	3.5	3.1	1	5	12.6
64	4	2.5	2.5	5	14.0
65	3.5	2.5	2	5	13.0
66	3.5	2.5	1	5	12.0
67	4	3.1	1.5	5	13.6
Avalon	4	2.5	5	2	13.5

APPENDIX I

NETWORK INVENTORY CHECKLIST

- ☐ Alleys that are currently closed to car traffic
  - o Closed to public car traffic, but accessible for residents – gated and locked
  - o Closed to all car traffic – width (pedestrian); overgrown – clearly not being driven down
- ☐ Parking analysis
  - o Which homes need to use the alley to access their parking?
- ☐ Proposed infrastructure improvements for streets and alleys
  - o Paving/re-paving
  - o Sidewalk repair
  - o Curb repair
  - o Sidewalk ramps
  - o Street/alley light installation/repair/replacement
  - o Street tree planting
  - o Other street/alley-related improvements
- ☐ Identify drainage issues (flooding, standing water, etc.)
  - o Include as question on surveys (will not be extensive data)
- ☐ Vacant lots – identify in Google, check against assessor maps
- ☐ Abandoned buildings (other opportunities for future development) – identify in Google Street View
- ☐ Circulation – City of LA Department of Transportation pedestrian routes for schools
- ☐ Identify and map specific connections between alley networks (public transit, walking, and bicycling connections)
- ☐ Identify and map specific connections within alley networks (public transit, walking, and bicycling connections)
  - o Sidewalks and crosswalks
  - o Bike routes and lanes (existing and proposed)
  - o Public transit stops
  - o Identify barriers to movement
- ☐ Stormwater study
  - o Stormwater capture opportunities
- ☐ Parking lots
- ☐ Large roofs
  - o Direction of stormwater flow
  - o Location of catch basins
  - o Capture/Infiltration potential
- ☐ Vacant lots
  - o LUST sites
- ☐ Sun/shade analysis
  - o Tree canopy
  - o Building heights
- ☐ Pedestrian, bike, car collisions
- ☐ Property and violent crimes
- ☐ Community destinations
  - o Items from Community Connections model
- ☐ Schools
- ☐ Parks and Rec Centers
- ☐ Grocery Stores
- ☐ Community Centers
- ☐ Places of Worship
- ☐ Libraries
- ☐ Police Stations
- ☐ Medical Centers
  - o Informal markets as observed from site visits
  - o Farmers Markets
  - o Community Gardens
- ☐ Street characteristics
  - o Width
  - o Number of traffic lanes
  - o Direction of traffic (one way/two way)
  - o Parking (parallel, angle)
- ☐ Alley characteristics
  - o Paving condition
  - o Width
  - o Visibility
  - o Dumping
  - o Vandalism
  - o Fencing/walls
  - o Lighting

APPENDIX J

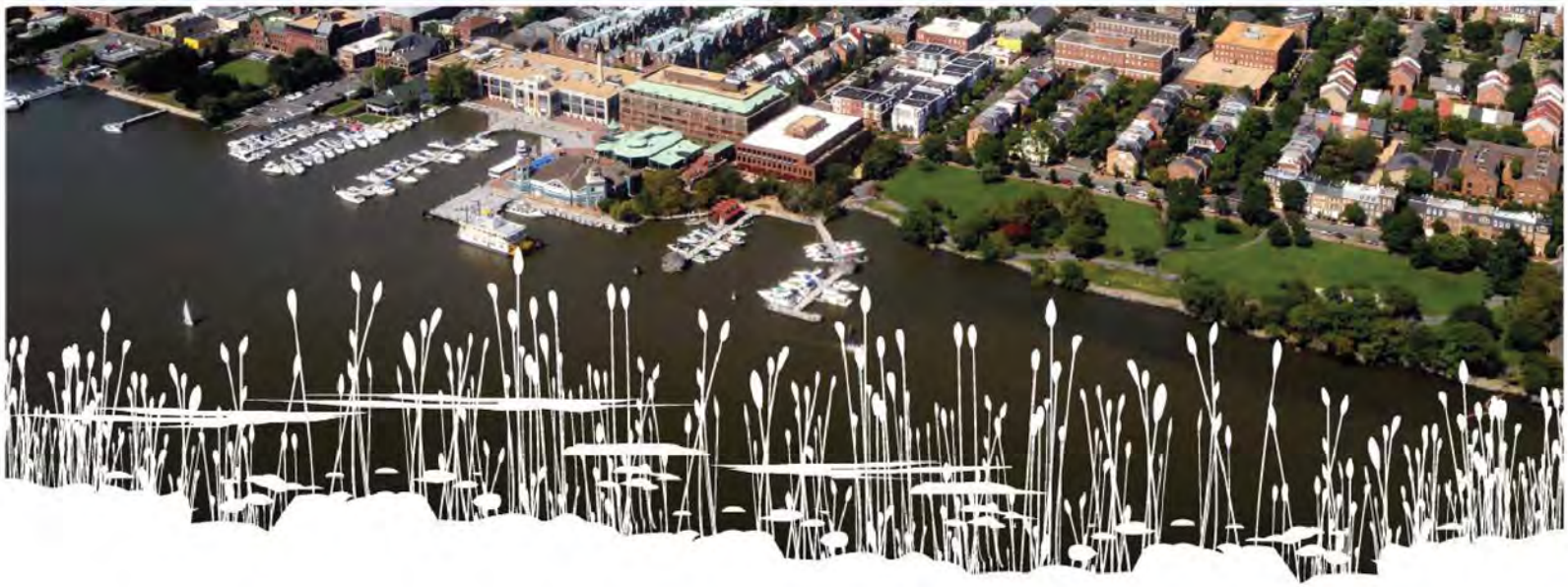
THE ENVIRONMENTAL PROTECTION AGENCY WATER QUALITY SCORECARD

EPA
United States
Environmental Protection
Agency

EPA 231B09001 | October 2009 | http://www.epa.gov

WATERQUALITY SCORECARD

Incorporating Green Infrastructure Practices at the Municipal, Neighborhood, and Site Scales



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1 Executive Summary

Many communities across the United States face the challenge of balancing water quality protection with the desire to accommodate new growth and development. These cities and counties are finding that a review of local ordinances beyond just stormwater regulations is necessary to remove barriers and ensure coordination across all development codes for better stormwater management and watershed protection. Local policies, such as landscaping and parking requirements or street design criteria, should complement strong stormwater standards and make it easier for developers to meet multiple requirements simultaneously.

EPA's Water Quality Scorecard was developed to help local governments identify opportunities to remove barriers, and revise and create codes, ordinances, and incentives for better water quality protection. It guides municipal staff through a review of relevant local codes and ordinances, across multiple municipal departments and at the three scales within the jurisdiction of a local government (municipality, neighborhood, and site),[1] to ensure that these codes work together to protect water quality goals. The two main goals of this tool are to: (1) help communities protect water quality by identifying ways to reduce the amount of stormwater flows in a community and (2) educate stakeholders on the wide range of policies and regulations that have water quality implications.

The scorecard is for municipalities of various sizes in rural, suburban, and urban settings, including those that have combined sewers, municipal separate storm sewers, and those with limited or no existing stormwater infrastructure. It can help municipal staff, stormwater managers, planners, and other stakeholders to understand better where a municipality's[2] land development regulations and other ordinances may present barriers or opportunities to implementing a comprehensive water quality protection approach. The scorecard provides policy options, resources, and case studies to help communities develop a comprehensive water quality program.

1 While the watershed scale is the best scale at which to look regionally at water quality protection strategies, it can be difficult to align policies, incentives, and regulations across political boundaries. For purposes of implementation, the largest scale the scorecard uses is the municipality.

2 The term "municipality" as used by the International City/County Management Association (ICMA) refers to local government at both the city and county levels.

2 Background

Growth and development expand communities' opportunities by bringing in new residents, businesses, and investments. Growth can give a community the resources to revitalize a downtown, refurbish a main street, build new schools, and develop vibrant places to live, work, shop, and play. The environmental impacts of development, however, can make it more difficult for communities to protect their natural resources. The U.S. Census Bureau projects that the U.S. population will reach 400 million people by about 2040, which will add continued development pressure on local communities and the environment. Many communities are asking where and how they can accommodate this growth while maintaining and improving their water resources.

Land development directly affects watershed functions. When development occurs in previously undeveloped areas, the resulting alterations to the land can dramatically change the transportation and storage of water. Residential and commercial development creates impervious surfaces and compacted soils that filter less water, which increases surface runoff and decreases groundwater infiltration. These changes can increase the volume and velocity of runoff, the frequency and severity of flooding, and peak storm flows.



Mixed use developments, like main street in Cedar Falls, Iowa, allow for the co-locating of land uses, which decreases impervious surfaces and stormwater runoff problems.

Many communities are already struggling with degraded water bodies and failing infrastructure. For example, *EPA's National Water Quality Inventory: 1996 Report to Congress* indicated that 36 percent of total river miles assessed were impaired.[3] In EPA's 2004 Report to Congress, that percentage increased to 44 percent.[4] Further, a report by the National Academy of Sciences found urban stormwater is estimated to be the primary source of impairment for 13 percent of assessed rivers, 18 percent of lakes, and 32 percent of estuaries—significant numbers given that urban areas cover only 3 percent of the land mass of the United States.[5]

Urban runoff also affects existing wastewater and drinking water systems. EPA estimates that between 23,000 and 75,000 sanitary sewer overflows occur each year in the United States, releasing between 3 and 10 billion gallons of sewage annually.[6] Many of these overflow problems stem from poor stormwater management. Many municipalities—both large and small—must address the impact of existing impervious areas, such as parking lots, buildings, and streets and roads, that have limited or no stormwater management while at the same time trying to find effective and appropriate solutions for new development.

These water quality impairments exist, in part, because historically stormwater management—and indeed stormwater regulation—has focused primarily at the site level. The reasoning was sound: manage stormwater well at the site, and water bodies in the community will be protected. However, as the findings of EPA's National Water Quality Inventory demonstrated, this strategy has not been effective for two main reasons.

First, the site-level approach does not take into account the amount of off-site impervious surfaces. During the development boom from 1995-2005, rain-absorbing landscapes, such as forests, wetlands, and meadows, were transformed into large areas of houses, roads, office buildings, and retail centers. This development created vast areas of impervious cover, which generated significant increases in stormwater runoff. However, the amount of development in the watershed is not simply the sum of the sites within it. Rather, total impervious area in a watershed is the sum of sites developed plus the impervious surface of associated infrastructure supporting those sites, such as roads and parking lots.

Second, federal stormwater regulations focus on reducing pollutants in the runoff—the sediments from roads, fertilizers from lawns, etc.—and not on the amount of stormwater coming from a site. Nevertheless, the increased volume of runoff coming into a municipality's water bodies scours streams, dumps sediments, and pushes existing infrastructure past its capacity limits. Failure to consider the cumulative impact—this loss of natural land, increased imperviousness, and resulting stormwater runoff volumes— on regional water quality and watershed health has led communities to seek stormwater solutions that look beyond site-level approaches.

Communities are recognizing the importance of managing water quality impacts of development at a variety of scales, including the municipal, the neighborhood, and site levels. A range of planning and development strategies at the municipal and neighborhood scales is necessary to address stormwater management comprehensively and systematically. At the same time that stormwater management is moving beyond the site level, it is also evolving beyond hardscaped, engineered solutions, such as basins and curb-and-gutter conveyance, to an approach that manages stormwater through natural processes.

A green infrastructure approach provides a solution to thinking at all three scales as well as addresses the need to change the specific types of practices used on the site. Green infrastructure is a comprehensive approach to water quality protection defined by a range of natural and built systems that can occur at the regional, community, and site scales. At the larger regional or watershed scale, green infrastructure is the interconnected network of preserved or restored natural lands and waters that provide essential environmental functions. Large-scale green infrastructure may include habitat corridors and water resource protection. At the community and neighborhood scale, green infrastructure incorporates planning and design approaches such as compact, mixed-use development, parking reductions strategies and urban forestry that reduces impervious surfaces and creates walkable, attractive communities. At the site scale, green infrastructure mimics natural systems by absorbing stormwater back into the ground (infiltration), using trees and other natural vegetation to convert it to water vapor (evapotranspiration), and using rain barrels or cisterns to capture and reuse stormwater. These natural processes manage stormwater runoff in a way that maintains or restores the site's natural hydrology.

3 *U.S. EPA National Water Quality Inventory: 1996 Report to Congress: http://www.epa.gov/305b/96report/index.html*

4 *U.S. EPA National Water Quality Inventory: 2004 Report to Congress: http://www.epa.gov/owow/305b/2004report/*

5 *Urban Stormwater Management in the United States, National Research Council of the National Academy of Sciences, 2008: http://dels.nas.edu/dels/rpt_briefs/stormwater_discharge_final.pdf*

6 *U.S. EPA National Water Quality Inventory: 2004 Report to Congress: http://www.epa.gov/owow/305b/2004report/*

At the municipal scale, decisions about where and how our towns, cities, and regions grow are the first, and perhaps most important, development decisions related to water quality. Preserving and restoring natural landscape features (such as forests, floodplains, and wetlands) are critical components of green infrastructure. By choosing not to develop on and thereby protecting these ecologically sensitive areas, communities can improve water quality while providing wildlife habitat and opportunities for outdoor recreation. In addition, using land more efficiently reduces and better manages stormwater runoff by reducing total impervious areas. Perhaps the single most effective strategy for efficient land use is redevelopment of already degraded sites, such as abandoned shopping centers or underused parking lots, rather than paving greenfield sites.

At the intermediate or neighborhood scale, green infrastructure includes planning and design approaches such as compact, mixed-use development, narrowing streets and roads, parking reduction strategies, and urban forestry that reduce impervious surfaces and better integrate the natural and the built environment.

At the site scale, green infrastructure practices include rain gardens, porous pavements, green roofs, infiltration planters, trees and tree boxes, and rainwater harvesting for non-potable uses such as toilet flushing and landscape irrigation.



Street retrofits can integrate green infrastructure, like this bioswale along Sandy Boulevard in Portland, Oregon, into standard roadway maintenance and upgrades.

These processes represent a new approach to stormwater management that is not only sustainable and environmentally friendly, but cost-effective as well.

Municipalities are realizing that green infrastructure can be a solution to the many and increasing water-related challenges facing municipalities, including flood control, combined sewer overflows, Clean Water Act requirements, and basic asset management of publicly owned treatment systems. Communities need new solutions and strategies to ensure that they can continue to grow while maintaining and improving their water resources. This Water Quality Scorecard seeks to provide the policy tools, resources, and case studies to both accommodate growth and protect water resources.

3 The Water Quality Scorecard

EPA worked with numerous water quality experts, local government staff, developers, urban designers, and others working on land use and water quality issues to develop this Water Quality Scorecard. The purpose of the scorecard is to address water quality protection across multiple scales (municipality, neighborhood, and site) and across multiple municipal departments. This scorecard can help municipal staff, stormwater managers, planners, and other stakeholders to understand better where a municipality's land development regulations and other ordinances may present barriers or opportunities to implementing a comprehensive green infrastructure approach. The tool's two main goals are to: (1) help communities protect water quality by identifying ways to reduce the amount of stormwater flows in a community and (2) educate stakeholders on the wide range of policies and regulations that have water quality implications.

Communities throughout the U.S. are implementing stormwater regulations that require or encourage the use of green infrastructure for managing stormwater on site. These cities and counties are finding that, to better manage stormwater and protect watersheds, green infrastructure policies require a review of many other local ordinances to remove barriers and ensure coordination across all development codes. Local policies, such as landscaping and parking requirements or street design criteria, should complement strong stormwater standards and make it easier for developers to meet multiple requirements simultaneously. At the same time, if these policies support water quality goals, they can independently reduce and better manage stormwater runoff.

How to Use the Scorecard

This scorecard is a locally controlled self-assessment and guide for better incorporating green infrastructure practices at the municipal, neighborhood, and site scales. While one department or agency could complete the tool, the effectiveness of this tool will increase if an interagency process is established to review all local codes and policies that might affect water quality.

Completing the Water Quality Scorecard requires different documents, plans, codes, and guidance manuals. While the legal structure for stormwater management and land development regulation varies among municipalities, the following list contains the most common and relevant documents to complete this scorecard and describes how they can create impervious cover.

- *Zoning ordinances* specify the type and intensity of land uses allowed on a given parcel. A zoning ordinance can dictate single-use low-density zoning, which spreads development throughout the watershed, creating considerable excess impervious surface.

- *Subdivision codes* or ordinances specify development elements for a parcel housing footprint minimums, distance from the house to the road, the width of the road, street configuration, open space requirements, and lot size—all of which can lead to excess impervious cover.

- *Street standards or road design guidelines* dictate the width of the road, turning radius, street connectivity, and intersection design requirements. Often in new subdivisions, roads tend to be too wide, which creates excess impervious cover.

- *Parking requirements* generally set the minimum, not the maximum, number of parking spaces required for retail and office parking. Setting minimums leads to parking lots designed for peak demand periods, such as the day after Thanksgiving, which can create acres of unused pavement during the rest of the year.

- *Setbacks* define the distance between a building and the right-of-way or lot line and can spread development out by leading to longer driveways and larger lots. Establishing maximum setback lines for residential and retail development will bring buildings closer to the street, reducing impervious cover associated with long driveways, walkways, and parking lots.

- *Height limitations* limit the number of floors in a building. Limiting height can spread development out if square footage is unmet by vertical density.

- *Open space or natural resource plans* detail land parcels that are or will be set aside for recreation, habitat corridors, or preservation. These plans help communities prioritize their conservation, parks, and recreation goals.

- *Comprehensive plans* may be required by state law, and many cities, towns, and counties prepare comprehensive plans to support zoning codes. Most comprehensive plans include elements addressing land use, open space, natural resource protection, transportation, economic development, and housing, all of which are important to watershed protection. Increasingly, local governments are defining existing green infrastructure and outlining opportunities to add new green infrastructure throughout the community.

An initial step in using this tool is to convene appropriate staff to review various sections of the tool and coordinate to both identify opportunities for change and address the potential inconsistencies between policies. The approaches described in this scorecard may be under the control of a number of different local government agencies, including:

- Parks and Recreation
- Public Works
- Planning
- Environmental Protection
- Utilities
- Transportation

The scorecard's review of land use and development policies provides guidance for implementing a range of regulatory and non-regulatory approaches, including land use planning elements, land acquisition efforts, and capital investment policies that can help various municipal agencies integrate green infrastructure into their programs. Internal agency policies and practices, such as maintenance protocols or plan review processes, may be potential barriers as well.

Each policy or approach is described in the context of its potential for providing water quality benefits, although most of the policies have many additional benefits for community livability, human health, air quality, energy use, wildlife habitat, and more. This tool does not provide model ordinance

language. It emphasizes best practices and helps municipalities understand the incremental steps for changing specific policies and internal agency practices. The scorecard divides the tools and policies into four categories:

1. Adopt plans/Educate
2. Remove barriers
3. Adopt incentives
4. Enact regulations

These four categories provide greater structure to the compiled tools by organizing the policies or approaches as incremental changes and updates. These categories may help municipal staff prioritize which tools to work on based on local factors like resources, time, and political support. For example, an appropriate first step in the process of updating local regulations may be to remove a barrier rather than enacting a new regulation. Most policy options avoid specific performance guidance so that the tool is useful to a range of municipalities in different contexts. However, the case studies and resources provide locally appropriate performance measures where possible.

To highlight the diverse nature of green infrastructure approaches, as well as the fact that oversight over these policies resides in various municipal agencies, the scorecard has five sections:

1. Protect Natural Resources (Including Trees) and Open Space
2. Promote Efficient, Compact Development Patterns and Infill
3. Design Complete, Smart Streets that Reduce Overall Imperviousness
4. Encourage Efficient Provision of Parking
5. Adopt Green Infrastructure Stormwater Management Provisions

The five sections organize green infrastructure approaches based on drivers of impervious cover at the municipal, neighborhood, and site scales. Yet all three scales may be in any single section. For example, the parking section will have questions that address the municipal, neighborhood and site level considerations.

The scorecard describes alternative policy or ordinance information that, when implemented, would support a comprehensive green infrastructure approach, and will allow the municipality to determine where, in the broad spectrum of policy implementation, their policies fall.

A Note about the Point System

The tool includes a point system to make it easier to evaluate and improve local programs. The municipality can decide whether to use the point system at all. If the point system is used, municipalities can set locally appropriate thresholds and goals.

Governments could choose to use the point system in many different ways, including:

- State governments could require municipalities to complete the Water Quality Scorecard and establish measures for improvement over different permit cycles. For example, a municipality might have to improve its score by some number of points before the next permit cycle.
- Local governments could determine a score based on existing programs and policies and then set goals from this baseline. Local targets may include incremental yearly improvements or achieving additional points in a particular section, such as "Encourage Efficient Parking Supply" or "Protect Natural Resources and Open Space."
- Stakeholders such as watershed groups or environmental organizations could complete the scorecard and then provide feedback and information assistance to the local government about sections within the scorecard that received few points and might be an area for improvement.
- The total score or scores in certain sections could educate elected officials, decision makers, and others about the importance of these issues and the role of local policies in addressing them.
- A lack of points in one section may alert a municipality that a certain area, such as parking, lacks local ordinances that support green infrastructure and may be ripe for improvement.
- Variation in the number of points achieved across the five sections may help a municipality to better assess local sources of impervious cover and potential for the introduction of green infrastructure.

Because the scorecard is intended for use by a range of community types and sizes in locations throughout the U.S., please note that no single municipality will be able to receive every point. Some questions and points may only be



A green roof located on the Friends Center in downtown Philadelphia, Pennsylvania provides stormwater management capacity and adds aesthetic value to this dense urban environment.

available to urban municipalities while others may only be available to those in a suburban or rural setting.

Tips for Building Relationships Between Stormwater Managers, Land Use Planners, and Other Local Officials

Effective stormwater management requires coordination and collaboration across many different municipal departments and processes. Below are some ideas for incorporating stormwater management in traditional planning processes and programs.

- Include both land use planners and stormwater managers in pre-concept and/or pre-application meetings for potential development projects.
- Use local government sites (e.g., schools, regional parks, office buildings, public works yards) as demonstration projects for innovative land use strategies and stormwater management. Form a team that includes land use planners, stormwater managers, parks and school officials, etc. to work out the details.
- Include stormwater managers in the comprehensive plan process to incorporate overall watershed and stormwater goals.
- Make sure that both land use planners and stormwater managers are involved in utility and transportation master planning.
- Allow stormwater managers to be involved in economic development planning, especially for enterprise zones, Main Street projects, and other projects that involve infill and redevelopment. Encourage stormwater managers to develop efficient watershed-based solutions for these plans.
- Develop cross training and joint activities that allow land use planners, stormwater managers, and transportation, utility, and capital projects planners to explore the improved integration of various land use and stormwater processes.
- Hold staff trainings with speakers that are knowledgeable about smart growth and stormwater management. Alternately, encourage land use planners, stormwater managers, and other local officials to attend trainings on this topic as a team.

Table 1: Water Quality Scorecard Quick Reference Guide

Incorporating Green Infrastructure Practices at the Municipal, Neighborhood, and Site Scales (SUMMARY)

	Policy Question	Goal
PROTECT NATURAL RESOURCES (INCLUDING TREES) AND OPEN SPACE		
1A.	**NATURAL RESOURCE PROTECTION**	
	Are development policies, regulations, and incentives in place to protect natural resource areas and critical habitat?	Protect natural resource areas (e.g., forests, prairies) and critical habitat (e.g., conservation corridors, buffer zones, wildlife preserves) from future development.
	Are no-development buffer zones and other protective tools in place around wetlands, riparian areas, and floodplains to improve/protect water quality?	Protect critical areas such as wetlands, floodplains, lakes, rivers, and estuaries with a mandatory no-development buffer.
	Does the community have protection measures for source water protection areas through land use controls and stewardship activities?	Protect source water areas from current or potential sources of contamination.
1B.	**OPEN SPACE PROTECTION**	
	Does the jurisdiction have adequate open space in both developed and greenfield areas of the community?	Create open networks throughout a community that serve a dual function of providing recreational areas and assisting in management of stormwater runoff.
1C.	**TREE PRESERVATION**	
	Does the local government have a comprehensive public urban forestry program?	Protect and maintain trees on public property and rights-of-way and plant additional trees to enhance the urban tree canopy.
	Has the community taken steps to protect trees on private property?	Preserve trees on private property and require replacement when trees are removed or damaged during development.
	Do local codes encourage or require street trees as part of road and public right-of-way capital improvement projects?	Leverage existing capital funds to plant more street trees and add multiple benefits to the public right-of-way.
PROMOTE EFFICIENT, COMPACT DEVELOPMENT PATTERNS AND INFILL		
2A.	**INFILL AND REDEVELOPMENT**	
	Are policy incentives in place to direct development to previously developed areas?	Municipalities implement a range of policies and tools to direct development to specific areas.
2B.	**DEVELOPMENT IN AREAS WITH EXISTING INFRASTRUCTURE**	
	Is the jurisdiction directing growth to areas with existing infrastructure, such as sewer, water, and roads?	Adopt policies, incentives, and regulations to direct new development to areas that have infrastructure, such as water and sewer.
2C.	**MIXED-USE DEVELOPMENT**	
	Are mixed-use and transit oriented developments allowed or encouraged?	Revise codes and ordinances to allow for the "by right" building of mixed-use and transit-oriented developments.

Incorporating Green Infrastructure Practices at the Municipal, Neighborhood, and Site Scales (SUMMARY) continued

	Policy Question	Goal
DESIGN COMPLETE, SMART STREETS THAT REDUCE OVERALL IMPERVIOUSNESS		
3A.	**STREET DESIGN**	
	Do local street design standards and engineering practices encourage streets to be no wider than is necessary to move traffic effectively? Do policies allow narrow neighborhood streets designed to slow traffic and create safer conditions for pedestrians and bicyclists?	Appropriate street widths allow narrower lanes for certain street types, thereby reducing overall imperviousness.
	Are shared driveways, reduced driveway widths, two-track driveways, and rear garages and alleys encouraged for all single-family developments?	Encourage alternative forms and decreased dimensions of residential driveways and parking areas.
3B.	**GREEN INFRASTRUCTURE ELEMENTS AND STREET DESIGN**	
	Are major street projects required to integrate green infrastructure practices as a standard part of construction, maintenance, and improvement plans?	Formally integrate green infrastructure into standard roadway construction and retrofit practice.
	Do regulations and policies promote use of pervious materials for all paving areas, including alleys, streets, sidewalks, crosswalks, driveways, and parking lots?	Build and retrofit these surfaces with pervious materials to reduce stormwater runoff and its negative impacts.
ENCOURAGE EFFICIENT PROVISION OF PARKING		
4A.	**REDUCED PARKING REQUIREMENTS**	
	Does your local government provide flexibility regarding alternative parking requirements (e.g., shared parking, off-site parking) and discourage over-parking of developments? Do parking requirements vary by zone to reflect places where more trips are on foot or by transit?	Match parking requirements to the level of demand and allow flexible arrangements to meet parking standards.
4B.	**TRANSPORTATION DEMAND MANAGEMENT ALTERNATIVES**	
	Does the municipality allow developers to use alternative measures such as transportation demand management or in-lieu payments to reduce required parking?	Provide flexibility to reduce parking in exchange for specific actions that reduce parking demands on site.
4C.	**MINIMIZING STORMWATER FROM PARKING LOTS**	
	Are there requirements for landscaping designed to minimize stormwater in parking lots?	Require substantial landscaping to help reduce runoff.
ADOPT GREEN INFRASTRUCTURE STORMWATER MANAGEMENT PROVISIONS		
5A.	**GREEN INFRASTRUCTURE PRACTICES**	
	Are green infrastructure practices encouraged as legal and preferred for managing stormwater runoff?	Make all types of green infrastructure allowed and legal and remove all impediments to using green infrastructure (including for stormwater requirements), such as limits on infiltration in rights-of-way, permit challenges for green roofs, safety issues with permeable pavements, restrictions on the use of cisterns and rain barrels, and other such unnecessary barriers.
	Do stormwater management plan reviews take place early in the development review process?	Incorporate stormwater plan comments and review into the early stages of development review/site plan review and approval, preferably at pre-application meetings with developers.

Incorporating Green Infrastructure Practices at the Municipal, Neighborhood, and Site Scales (SUMMARY) continued

	Policy Question	Goal
	Do local building and plumbing codes allow harvested rainwater use for exterior uses such as irrigation and non-potable interior uses such as toilet flushing?	Ensure that the municipality allows and encourages stormwater reuse for non-potable uses.
	Are provisions available to meet stormwater requirements in other ways, such as off-site management within the same sewershed or "payment in lieu" of programs, to the extent that on-site alternatives are not technically feasible?	Allow off-site management of runoff while still holding developers responsible for meeting stormwater management goals.
5B.	**MAINTENANCE/ENFORCEMENT**	
	Does your stormwater ordinance include monitoring, tracking, and maintenance requirements for stormwater management practices?	Incorporate monitoring, tracking, and maintenance requirements for stormwater management practices into your municipal stormwater ordinance.

Getting Started

Below are suggested steps to help complete the Water Quality Scorecard:

Step 1. Review the scorecard to identify which agencies, departments, or personnel will be required to complete each section.

Step 2. Convene appropriate staff to review various sections of the tool, and work together to ensure that updates and changes to codes, policies, and internal processes align well with other agency changes.

Step 3. Collect existing ordinances and policies that will be necessary references to complete the scorecard.

Step 4. Coordinate between appropriate agencies or departments to complete the scorecard.

Please indicate by your signature that you have reviewed the tool with all co-signees of this document (name, department, and date):

Step 5: Identify sections of the scorecard and/or specific policy questions that should be prioritized for immediate revision or update.

Step 6: Identify short-, medium-, and long-term goals and strategies for revising local policies to better support green infrastructure.

1 Protect Natural Resources (Including Trees) and Open Space

Sensitive Natural Lands/Critical Area Protection

QUESTION: Are development policies, regulations, and incentives in place to protect natural resource areas and critical habitat?

GOAL: Protect natural resource areas (e.g., forests, prairies) and critical habitat (e.g., conservation corridors, buffer zones, wildlife preserves) from future development.

WHY: Protection of significant tracts of critical lands and wildlife habitat will aid in protecting and improving water quality by increasing infiltration and groundwater recharge, preventing erosion and contamination of ground water and surface water resources, and protecting sources of drinking water.

Implementation Tools and Policies	Pts. Avail.	Pts. Rec. or N/A	Notes and Local References
ADOPT PLANS/EDUCATE:			
Identify and map critical natural resource areas (e.g., steep slopes, wildlife habitat, forests, drinking water source areas).	1		
The local comprehensive plan contains a natural resource protection element with goals calling for preservation of identified critical natural resource areas.	1		
Identify key natural resource areas for protection in jurisdiction's parks and open space plan.	1		
Assist landowners in identifying sensitive natural areas and laying out developments to avoid such areas.	1		
Local plans establish and enforce areas which are available for development and which lands are a priority for preservation.	1		
REMOVE BARRIERS:			
Protection of sensitive natural areas and wildlife habitat qualifies for credit towards local open space dedication and set-aside requirements.	1		
ADOPT INCENTIVES:			
Provide financial support to or collaborate with land trusts to acquire critical natural areas.	1		
Establish a dedicated source of funding for open space acquisition and management (e.g., bond proceeds, sales tax).	2		
Adopt a transferable developments rights program to provide an incentive for landowners to preserve sensitive natural lands and wildlife habitat.	1		
		PAGE TOTAL	◄ CARRY THIS SUBTOTAL TO NEXT PAGE = _____

Implementation Tools and Policies	Pts. Avail.	Pts. Rec. or N/A	Notes and Local References
Land use regulations provide for the creation of cluster and conservation subdivision on the periphery of urban growth areas to encourage preservation of intact blocks of sensitive natural areas.	1		
ENACT REGULATIONS:			
Adopt regulations to protect steep slope, hillsides, and other sensitive natural lands (e.g., by limiting development on slopes > 30% or requiring larger lot sizes in sensitive areas).	2		
Adopt wildlife habitat protection regulations aimed at preserving large contiguous blocks of habitat areas.	2		
Create agriculture/natural resource zoning districts (e.g., minimum lot size of 80 acres and larger) to preserve agricultural areas and forests.	2		
		PAGE TOTAL	SUBTOTAL FROM PREVIOUS PAGE + _____ = ▼ CARRY THIS SUBTOTAL TO NEXT PAGE _____

1.A.2a Protection Of Water Bodies/Aquifers

QUESTION: Are no-development buffer zones and other protective tools in place around wetlands, riparian areas, and floodplains that improve/protect water quality?

GOAL: Protect critical areas such as wetlands, floodplains, lakes, rivers, and estuaries with a mandatory no-development buffer.

WHY: The use of these practices will reduce pollutant loads and hydrologic alterations to water bodies.

Implementation Tools and Policies	Pts. Avail.	Pts. Rec. or N/A	Notes and Local References
ADOPT PLANS/EDUCATE:			
Identify and map critical water resource areas.	1		
The local comprehensive plan contains a water quality protection element with goals calling for protection of identified water bodies and other water resource areas such as wetlands.	1		
Identify key critical water resource areas for protection in jurisdiction's parks and open space plan.	1		
Cooperate in developing regional approaches to watershed protection and stormwater management.	1		
REMOVE BARRIERS:			
Wetlands and other water bodies and buffer areas qualify for credit against local open space dedication/set-aside regulations.	1		
ADOPT INCENTIVES:			
Protected water bodies and buffer areas qualify for twice the credit (or more) against open space requirements set by the municipality.	1		
Restoration of degraded riparian/wetland areas qualifies for additional open space credit within the local municipal system.	1		
Transfer of density from protected riparian areas/buffers to upland portions of development sites.	1		
ENACT REGULATIONS:			
Riparian and wetland buffer areas required by local land use regulations Buffer is at least 50 feet (as measured from the top of bank) = 1 point Buffer is at least 100 feet (as measured from the top of bank) = 2 points Buffer is greater than 100 feet (as measured from the top of bank) = 3 points	1 to 3		
Critical water resource areas cannot be counted in calculating allowable density on a site (e.g., on a 200-acre site with 50 acres of wetlands, only 150 acres can be used to calculate density under zone district regulations, and only those 150 acres may be developed).	1		
		PAGE TOTAL	SUBTOTAL FROM PREVIOUS PAGE + _____ ▼ CARRY THIS SUBTOTAL TO NEXT PAGE = _____

Implementation Tools and Policies	Pts. Avail.	Pts. Rec. or N/A	Notes and Local References
Development in floodplains is prohibited or must demonstrate no adverse impacts upstream and downstream (See resources below for details on "no adverse impact" approach to floodplain management).	2		
Stormwater quality and quantity performance standards exist for development sites (e.g., restrictions on sedimentation levels, pre/post development flows).	1		
Local regulations require restoration of degraded riparian/wetland areas on a development site.	1		
Compensation for damage to riparian/wetland areas must be on a minimum 2:1 basis on- or off-site.	1		
Performance standards exist and are well enforced for stormwater discharges to wetlands that protect the hydrologic regimes and limit pollutant loads.	1		
		PAGE TOTAL	SUBTOTAL FROM PREVIOUS PAGE + _____ ▼ CARRY THIS SUBTOTAL TO NEXT PAGE = _____

1.A.2b Protection Of Water Bodies/Aquifers

QUESTION: Does the community have protection measures for source water protection areas through land use controls and stewardship activities?

GOAL: Protect source water areas from current or potential sources of contamination.

WHY: These practices will help safeguard community health, reduce the risk of water supply contamination, and potentially reduce water treatment costs.

Implementation Tools and Policies	Pts. Avail.	Pts. Rec. or N/A	Notes and Local References
ADOPT PLANS/EDUCATE:			
Local land use plans identify aquifer recharge/source water areas and recommend protective measures.	1		
Require that all stormwater inlets carry a notice regarding discharge to receiving waters.	1		
Map and publish wellhead and aquifer recharge areas to alert developers to potential restrictions.	1		
ADOPT INCENTIVES:			
Identification of drinking water source protection and aquifer recharge areas with a dedicated funding source in place to purchase and protect such areas.	1		
Protection of critical water source areas qualifies for additional credit towards local open space requirements.	1		
ENACT REGULATIONS:			
Adopt well-head protection regulations/zones to prevent incompatible development and uses.	1		
Adopt aquifer protection regulations/zones to prevent incompatible development and uses.	2		

PAGE TOTAL

SUBTOTAL FROM PREVIOUS PAGE + _____ = _____ ▼ CARRY THIS SUBTOTAL TO NEXT PAGE

1.B Open Space Protection

1.B.1

QUESTION: Does the jurisdiction have adequate open space in both developed and greenfield areas of the community?

GOAL: Create open space networks throughout a community that serve a dual function of providing recreational areas and assisting in the management of stormwater runoff.

WHY: In addition to providing open space throughout a community as an amenity, such a network can provide large areas that contribute little to stormwater loads and can provide large areas for the infiltration and purification of stormwater.

Implementation Tools and Policies	Pts. Avail.	Pts. Rec. or N/A	Notes and Local References
ADOPT PLANS/EDUCATE:			
Adopt a community-wide open space and parks plan.	1		
The local comprehensive plan contains an open space/parks element that recognizes the role of open space in sustainable stormwater management.	1		
REMOVE BARRIERS:			
Green infrastructure practices count towards local open space set aside requirements up to 50% of total.	1		
Allow and encourage retrofits of abandoned or underutilized public lands to serve as permanent or temporary open space and green infrastructure sites.	1		
ADOPT INCENTIVES:			
Additional open space credits are eligible for green stormwater management facilities improved/designed for public recreational purposes.	1		
Provide credit against open space impact fees for green roofs.	1		
ENACT REGULATIONS:			
Adopt neighborhood policies and ordinances that work to create neighborhood—not development site—open space amenities that are within ¼ to ½ mile walking distance from every residence.	1		
Adopt an open space impact fee to purchase passive open space that can assist in stormwater management.	1		
Adopt open space dedication and/or set aside requirements based on the demand generated by the development. As a baseline, use the average open space requirements adopted by the National Recreation and Park Assn. (e.g., 10 acres of community and neighborhood parks for every 1,000 persons in a development or fraction thereof).	1		
		PAGE TOTAL	SUBTOTAL FROM PREVIOUS PAGE + _____ ▼ CARRY THIS SUBTOTAL TO NEXT PAGE = _____

1.C Tree Protection

1.C.1

QUESTION: Does the local government have a comprehensive public urban forestry program?

GOAL: Protect and maintain trees on public property and rights-of-way and plant additional trees to enhance the urban tree canopy.

WHY: Mature trees provide multiple community benefits, reduce overall stormwater runoff, and improve stormwater quality.

Implementation Tools and Policies	Pts. Avail.	Pts. Rec. or N/A	Notes and Local References
ADOPT PLANS/EDUCATE:			
Survey and inventory existing trees on public lands and street rights-of-way. Document the characteristics and location of street trees and urban tree canopy to inform public tree planting, adoption, and maintenance programs.	1		
Select tree species based on known performance for managing stormwater runoff. Publish list and make widely available for homeowners/others that plant street trees.	1		
Conduct education and outreach about tree protection, proper maintenance, and replanting opportunities through printed materials, workshops, events, and signage.	1		
Adopt a policy to protect existing trees on local government development sites (e.g., municipal parking lots, municipal buildings).	1		
Maintain an active tree maintenance program for public trees, including pest control, pruning, watering, and similar measures.	1		
REMOVE BARRIERS:			
Acknowledge trees as part of community infrastructure and develop a coordinated design for locating public utilities to provide enough space for mature tree canopy and root development.	1		
ADOPT INCENTIVES:			
Provide free or reduced-price trees to homeowners to be used as street trees.	1		
ENACT REGULATIONS:			
Require any public trees removed or damaged during construction associated with private development to be replaced on- or off-site with an equivalent amount of tree caliper (e.g., remove a 24-inch diameter tree/replace with 6 four-inch diameter trees).	1		
Adopt construction protection rules for all public trees (e.g., fencing, no storage of hazardous materials, avoid cutting into root zones).	1		
		PAGE TOTAL	SUBTOTAL FROM PREVIOUS PAGE + _____ ▼ CARRY THIS SUBTOTAL TO NEXT PAGE = _____

QUESTION: Has the community taken steps to protect trees on private property?

GOAL: Preserve trees on private property and require replacement when trees are removed or damaged during development.

WHY: Mature trees provide multiple environmental, economic, and community benefits, including improved water and air quality, reduced heat island effects, lowered energy costs, and improved community aesthetics.

Implementation Tools and Policies	Pts. Avail.	Pts. Rec. or N/A	Notes and Local References
ADOPT PLANS/EDUCATE:			
Community plans specifically include tree preservation and replacement as community goals.	1		
Conduct educational sessions for builders and developers regarding appropriate tree protection techniques and/or publish a technical tree protection manual.	1		
Follow maintenance and inspection timelines and meet canopy goals and milestones by ensuring old trees survive, replacing dead or diseased trees, and planting new trees.	1		
REMOVE BARRIERS:			
Set up maintenance and inspection agreements for private properties meeting stormwater requirements or receiving stormwater fee credit for trees.	1		
Set up long-term maintenance and inspection schedules for trees on public lands.	1		
ADOPT INCENTIVES:			
Support local non-profits that plant trees and provide educational services.	1		
Provide financial incentives for tree purchases and planting.	1		
A tree fund has been established to receive in-lieu payments when trees must be removed from a development site to accommodate permitted projects.	1		
Trees of a specified minimum size count towards a percentage of stormwater management requirements (e.g., partial credit given for each mature tree exceeding a specified height or canopy size).	1		
Trees over a specified minimum size (e.g., 3-inch caliper) protected during development are credited towards landscaping requirements. - meeting the established landscape requirement = 1 point - exceeding the established landscape requirement = 2 points	1 to 2		
		PAGE TOTAL	SUBTOTAL FROM PREVIOUS PAGE + _____ ▼ CARRY THIS SUBTOTAL TO NEXT PAGE = _____

Implementation Tools and Policies	Pts. Avail.	Pts. Rec. or N/A	Notes and Local References
ENACT REGULATIONS:			
Require permits before removing trees on proposed development or redevelopment sites. Provide fines and/or stop-work authority for permit violations.	1		
Set minimum tree preservation standards for new development sites.	1		
Require site plans or stormwater plans to include tree preservation.	1		
Require/allow tree replacement off-site for infill sites.	1		
		PAGE TOTAL	SUBTOTAL FROM PREVIOUS PAGE + _____ = _____ ▼ CARRY THIS SUBTOTAL TO NEXT PAGE

1.C.3	QUESTION:	Are street trees encouraged or required as part of road and public right-of-way capital improvement projects?
	GOAL:	Leverage existing capital funds to plant more street trees and add multiple benefits to the public right-of-way.
	WHY:	Street trees can help manage and reduce stormwater runoff while providing multiple public and environmental benefits.

Implementation Tools and Policies	Pts. Avail.	Pts. Rec. or N/A	Notes and Local References
ADOPT PLANS/EDUCATE:			
Local comprehensive and transportation plans support the planting of street trees by all private and public development projects.	1		
Capital improvement plans include tree planning as part of project budgets.	1		
ADOPT INCENTIVES:			
Offer incentives, such as reduced setbacks or increased building densities, in exchange for additional tree preservation beyond ordinance requirements.	1		
ENACT REGULATIONS:			
All private and public developments are required to plant street trees in accordance with size, spacing, and other local government requirements.	1		
New street designs and redesigns of existing streets take into account space for tree development and require necessary surface area and volume of soil dependent on type of tree species selected (this includes lateral root growth as well as direct downward growth to accommodate mature tree canopy and roots without adversely affecting other utilities).	1		
Street specifications require permeable paving for sidewalks and other surfaces to reduce stormwater runoff and allow street trees to benefit from the available water.	1		
		PAGE TOTAL	

SUBTOTAL FROM PREVIOUS PAGE + _____ = _____ TOTAL POINTS AVAILABLE: 82

▼ **Total score for SECTION 1: PROTECT NATURAL RESOURCES (INCLUDING TREES) AND OPEN SPACE**

This section has been reviewed and scored by _____

Department name _____ Signee _____

Resources

- Planner's Guide to Wetland Buffers for Local Governments, Environmental Law Institute: *http://www.elistore.org/reports_detail.asp?ID=11272*
- Mertes, James D. and James R. Hall. Park, Recreation, Open Space and Greenway Guidelines. National Recreation and Park Association, 1996.
- Center for Watershed Protection guidance on aquatic buffers: *http://www.cwp.org/Resource_Library/Restoration_and_Watershed_Stewardship/perviousarea.htm*
- "Protecting Stream and River Corridors: Creating Effective Local Riparian Buffer Ordinances," Carl Vinson Institute of Government, The University of Georgia: *http://www.rivercenter.uga.edu/publications/pdf/riparian_buffer_guidebook.pdf*
- No Adverse Impact Floodplain Management, Association of State Floodplain Managers: *http://www.floods.org/index.asp?menuID=349&firstlevelmenuID=187&siteID=1*
- Riparian Toolbox: Model Regulations and Legal Issues, Long Island Sound Study: *http://www.longislandsoundstudy.net/riparian/legal.htm*
- Model Ordinances to Protect Local Resources: Aquatic Buffers, U.S. EPA *http://www.epa.gov/owow/nps/ordinance/osm1.htm*
- Duerksen, Christopher and Cara Snyder. Nature-Friendly Communities: Habitat Protection and Land Use Planning. Island Press, 2005.
- City Trees: Sustainability Guidelines and Best Practices: *http://www.treetrust.org/pdf/community-forestry-city-trees-bonestroo.pdf*
- Guide to Setting Urban Tree Canopy Goals, American Forests: *http://www.americanforests.org/resources/urbanforests/treedeficit.php*
- Urban Forestry Manual, Center for Watershed Protection: *http://www.cwp.org/forestry/part3forestrymanual.pdf* (pg. 69))
- Duerksen, Christopher and Suzanne Richman, "Tree Conservation Ordinances." American Planning Association. 1993: Planning Advisory Service Report No. 446.
- Duerksen, Christopher , Mowery, M. and McGlyn M. "Tree Preservation." Zoning Practice. July 2006: American Planning Association, Volume 23 Number 7.
- "Trees for green streets: An illustrated guide," Portland Metro: *http://www.metro-region.org/index.cfm/go/by.web/id=26337*
- *Tree Preservation Information Guide, Portland, Oregon: http://www.sustainableportland.org/shared/cfm/image.cfm?id=72545*
- Storm Water Pollution Prevention Plan (SWPPP) Guide, U.S. EPA: *http://cfpub.epa.gov/npdes/stormwater/swppp.cfm*
- Center for Urban Forest Research, U.S. Forest Service: *http://www.fs.fed.us/psw/programs/cufr/*
- Urban Forest Policy and Management, U.S. Forest Service: *http://www.fs.fed.us/psw/programs/cufr/research/studies.php?TopicID=1*
- Plants for Stormwater Design Volume II, Great River Greening: *http://www.greatrivergreening.org/_downloads/PSD%20II%20Sample.PDF*

Case Studies

- Alachua County, Florida's land conservation and acquisition program, *Alachua County Forever,* has conserved over 17,000 acres of environmentally sensitive land: *http://www.alachuacounty.us/government/depts/epd/land/filesforms.aspx*
- Baltimore County, Maryland's Master Plan 2010 designates land management areas that include agricultural preservation areas and resource preservation areas: *http://www.baltimorecountymd.gov/Agencies/planning/masterplanning/smartgrowth.html*
- King County, Washington's Greenprint Project is an open space and resource conservation strategy that focuses on land acquisition, restoration projects, regulatory changes and protection within the urban growth boundary: *http://dnr.metrokc.gov/wlr/greenprint/about.htm*
- The Pennsylvania Horticultural Society's *Philadelphia Green* program revitalizes and maintains abandoned land and public spaces by partnering with government, businesses and the community: *http://www.pennsylvaniahorticulturalsociety.org/phlgreen/about.html*
- Chicago, Illinois's Open Space Impact Fee Ordinance charges a fee associated with residential development building permits and spends the funds on acquisition of neighborhood open space in the same area where development occurs: *http://egov.cityofchicago.org/city/webportal/portalContentItemAction.do?blockName=Buildings%2FContent&deptMainCategoryOID=-536901233&entityName=Buildings&topChannelName=Dept&contentOID=536988877&contentTypeName=COC_EDITORIAL*
- Lenexa, Kansas's Watershed Management Plan includes erosion and sediment control, stream buffers, subwatershed protection and

improvement, and design standards for the city's uniform development code: *https://www.ci.lenexa.ks.us/Planning/compplan/Overview/*

- The Maryland Cooperative Extension Service provides a fact sheet on how to design, plant and maintain a riparian forest buffer: *http://www.riparianbuffers.umd.edu/fact/FS725.html*
- Vermont's Department of Environmental Conservation offers grants to conservation organizations to purchase or receive donated river corridor easements on private property within priority stretches of river: *http://www.anr.state.vt.us/dec/waterq/rivers/docs/rv_RiverCorridorEasementGuide.pdf*
- The U.S. Department of Agriculture's Natural Resources Conservation Service provides guidance on riparian buffers through the Ohio Lake Erie Buffer Program: *http://www.oh.nrcs.usda.gov/programs/Lake_Erie_Buffer/riparian.html*
- Davidson, North Carolina requires a public park within a five minute walk of all housing units, providing multifunctional neighborhood open space: *http://www.ci.davidson.nc.us/index.aspx?NID=576*
- San Jose, California gives post-construction stormwater treatment credit for new and existing trees in close proximity to impervious areas: *http://www.sanjoseca.gov/planning/stormwater/Policy_6-29_Memo_Revisions.pdf*
- Portland, Oregon gives a stormwater fee discount for trees over 15 feet tall: *http://www.portlandonline.com/bes/index.cfm?c=43444&#types*
- Portland, Oregon also gives a tree credit for meeting local stormwater requirements: *http://www.portlandonline.com/shared/cfm/image.cfm?id=93075*
- Portland, Oregon Parks and Recreation and Bureau of Development Services regulate tree cutting on private property and public property: *http://www.portlandonline.com/parks/index.cfm?c=39712*
- New York City requires street tree planting for a range of developments and zoning increases: *http://www.nyc.gov/html/dcp/html/street_tree_planting/index.shtml*
- Charlottesville, North Carolina has set goals for achieving a 40% minimum urban tree canopy: *http://www.charlottesville.org/Index.aspx?page=1745* (Chapter 8, pgs. 184-187)

2 Promote Efficient, Compact Development Patterns and Infill

2.A Support Infill and Redevelopment

2.A.1

QUESTION: Are policy incentives in place to direct development to previously developed areas?

GOAL: Municipalities implement a range of policies and tools to direct development to specific areas.

WHY: Municipalities can realize a significant reduction in regional runoff if they take advantage of underused properties, such as infill, brownfield, or greyfield sites. Redeveloping already degraded sites such as abandoned shopping centers or underutilized parking lots rather than paving greenfield sites for new development can dramatically reduce total impervious area while allowing communities to experience the benefits and opportunities associated with growth.

Implementation Tools and Policies	Pts. Avail.	Pts. Rec. or N/A	Notes and Local References
ADOPT PLANS/EDUCATE:			
Local plans identify potential brownfield and greyfield sites, and support their redevelopment.	1		
Capital improvement plans include infrastructure improvements (water, sewer, road, sidewalk, etc. upgrades) for identified brownfield and greyfield sites.	1		
Educate lending and financial institutions about benefits and local priorities of directing development to existing areas.	1		
Conduct outreach to the community to ensure support for local forms and patterns of development.	1		
REMOVE BARRIERS:			
Establish a brownfields program to remove uncertainty regarding cleanup and liability issues.	1		
ADOPT INCENTIVES:			
Provide incentives such as density bonuses and accelerated permitting for brownfield and greyfield sites.	1		
Adopt funding mechanisms for remediating/redeveloping brownfield and greyfield sites.	1		
Streamline permitting procedures to facilitate infill and brownfield redevelopment plan review.	1		
Establish tax increment financing (TIF) districts to encourage redevelopment.	1		
ENACT REGULATIONS:			
In local codes, ordinances, and policies, the municipality differentiates between greenfield and infill development.	1		
		PAGE TOTAL	◄ CARRY THIS SUBTOTAL TO NEXT PAGE = _____

2.B.1

QUESTION: Does the municipality direct growth to areas with existing infrastructure, such as sewer, water, and roads?

GOAL: Adopt policies, incentives, and regulations to direct new development to areas that have infrastructure, such as water and sewer.
However, in situations where development is in areas with no sewer infrastructure, permitting alternative treatment options that can allow for higher density development or clustering of houses will reduce the overall water quality impact.

WHY: Sewer and water authorities can play a major role in directing a region's growth by determining when and where new infrastructure investment will occur. Well-drafted facility planning areas can direct growth by providing sewer service in areas least likely to impact water resources.

Implementation Tools and Policies	Pts. Avail.	Pts. Rec. or N/A	Notes and Local References
ADOPT PLANS/EDUCATE:			
Local plans recommend/establish urban growth areas and urban growth boundaries. Development is encouraged within urban growth boundaries and discouraged outside of them.	1		
Analyze which areas within the jurisdiction are appropriate for higher density development based on existing infrastructure capacity, cost of providing new services, and access.	2		
Capital improvement plans for public infrastructure (roads, water, sewer, etc.) target funding inside urban growth boundary..	2		
Local sewer/water authority capital improvement plans follow development policies established in local comprehensive plans and target areas with existing development/infrastructure.	1		
REMOVE BARRIERS:			
Development standards addressing landscaping, buffering, parking, and open space are tailored for infill areas to avoid creating unnecessary hurdles to development (e.g., imposing suburban parking requirements in high-density infill areas).	2		
Remove prohibitions on accessory dwelling units in infill areas to increase density of development.	2		
Off-site, regional water retention/detention encouraged/allowed to avoid costly on-site retention in densely developed infill areas and to provide benefit to priority retrofit sites, such as schools.	2		
Package plants and other wastewater treatment trains are encouraged for development in limited circumstance areas where growth is appropriate but sewers/treatment capacity does not exist.	1		
		PAGE TOTAL	SUBTOTAL FROM PREVIOUS PAGE + _____ ▼ CARRY THIS SUBTOTAL TO NEXT PAGE = _____

Implementation Tools and Policies	Pts. Avail.	Pts. Rec. or N/A	Notes and Local References
Technical information and analysis on the effectiveness of various treatment systems are readily available to developers. Local governments have determined which systems work best for their soil conditions and topography and have made this information available to the development community.	1		
Allow a wide variety of housing types and sizes within infill areas and reduced minimum lot sizes.	1		
ADOPT INCENTIVES:			
Increase development densities and allowable height in infill areas.	1		
Reduce impact fees for infill development based on less demand for new infrastructure.	1		
Create development incentives for green roofs (e.g., increased floor area ratio (FAR) bonus, additional building height).	1		
Include provision in stormwater management requirement that reduces on-site management requirements for projects that decrease total imperviousness on previously developed sites.	1		
ENACT REGULATIONS:			
Zoning and land development regulations implement urban service areas/ urban growth boundary policies by restricting development in outlying areas.	1		
Adopt adequate public facility and concurrency ordinances that require adequate public infrastructure to be available when development comes on line (e.g., water, sewer, roads).	1		
Adopt large-lot/agricultural zoning (e.g., 1 unit/160 acres) on fringe of city to restrict inappropriate greenfield development.	1		
Enact transitional compatibility standards to ensure that new denser infill development is compatible with existing neighborhoods/adjacent development.	1		

PAGE TOTAL | SUBTOTAL FROM PREVIOUS PAGE + _____ | ▼ CARRY THIS SUBTOTAL TO NEXT PAGE = _____

2.C Encourage Mixed-Use Developments

2.C.1

QUESTION: Are mixed-use and transit-oriented developments allowed or encouraged?

GOAL: Revise codes and ordinances to allow for the "by right" building of mixed-use and transit-oriented developments.

WHY: Mixed-use developments allow for the co-locating of land uses, which decreases impervious surfaces associated with parking and decreases vehicle miles traveled—resulting in a reduction of hydrocarbons left on roadways and reduced air deposition.

Transit-oriented development (TOD) produces water quality benefits by reducing: (1) land consumption due to smaller site footprints; (2) parking spaces and the impervious cover associated with them; and (3) average vehicle miles traveled, which, in turn, reduces deposition of air pollution into water bodies.

Implementation Tools and Policies	Pts. Avail.	Pts. Rec. or N/A	Notes and Local References
ADOPT PLANS/EDUCATE:			
Comprehensive plans identify appropriate areas for higher-density mixed-use developments (e.g., at transit stops) and recommend policies to encourage their development.	1		
Local capital improvement plans and funding are targeted to areas appropriate for mixed-use development.	2		
REMOVE BARRIERS:			
Zoning ordinances can create by-right mixed-use and transit-oriented development districts or overlays through amendments.	1		
Initiate map amendments to designate mixed-use and transit-oriented development areas, eliminating the need for developers to secure zoning amendments.	1		
ADOPT INCENTIVES:			
Parking requirements are reduced to reflect decreased automobile use.	1		
Credit given for adjacent on-street parking, which can count for local parking requirements.	1		
Shared parking and alternative parking arrangements encouraged.	1		
Mixed-use districts/areas feature increased densities and height.	1		
Accessory parking structures are not counted against maximum floor area ratio (FAR) on a site.	1		
		PAGE TOTAL	SUBTOTAL FROM PREVIOUS PAGE + _____ = _____ ▼ CARRY THIS SUBTOTAL TO NEXT PAGE

Implementation Tools and Policies	Pts. Avail.	Pts. Rec. or N/A	Notes and Local References
ENACT REGULATIONS:			
Zoning code requires a minimum mix of uses and minimum density in designated mixed-use and transit-oriented development areas.	1		
Auto-oriented uses and drive-throughs are restricted or prohibited in mixed-use and transit-oriented development areas.	1		

PAGE TOTAL

SUBTOTAL FROM PREVIOUS PAGE + _____ = _____ TOTAL POINTS AVAILABLE: 45

▼ **Total score for SECTION 2: PROMOTE EFFICIENT, COMPACT DEVELOPMENT PATTERNS AND INFILL**

This section has been reviewed and scored by _____

Department name _____ Signee _____

Resources

- "Protecting Water Resources with Higher-Density Development," U.S. EPA Development, Community and Environment Division: *http://www.epa.gov/dced/water_density.htm*
- "Infill Development: Completing the Community Fabric," Municipal Research and Services Center of Washington: *http://www.mrsc.org/Subjects/Planning/infilldev.aspx*
- Smart Growth Priority Funding Areas Act of 1997, Maryland Department of Planning: *http://www.mdp.state.md.us/fundingact.htm*
- Metro Regional Government Urban Growth Boundary, Portland Metro: *http://www.metro-region.org/index.cfm/go/by.web/id/277*
- Smart Growth Toolkit, Smart Growth Leadership Institute: *http://www.smartgrowthtoolkit.net/main-content/the-smart-growth-implementation-tools.html*
- "Water and Growth: Toward a Stronger Connection Between Water Supply and Land Use in Southeastern Pennsylvania," 10,000 Friends of Pennsylvania: *http://10000friends.org/water-and-growth*
- "Connecting Smart Growth and Brownfields Redevelopment," Center for Environmental Policy and Management, University of Louisville: *http://cepm.louisville.edu/publications/PDF_docs/smart%20growth%20and%20brownfields%20for%20website.pdf*
- "Strategies for Successful Infill Development," Northeast Midwest Institute: *http://www.nemw.org/infillbook.htm*
- "Smart Infill," Greenbelt Alliance: *http://www.greenbelt.org/resources/reports/smartinfill/index.html*
- Infill Incentives, Policy Link: *http://www.ci.phoenix.az.us/BUSINESS/infilpgm.html*

Case Studies

- Wisconsin Department of Natural Resources is responsible for helping municipalities establish Sewer Service Area Planning to protect water quality and guide growth within public sewer systems: *http://dnr.wi.gov/org/water/wm/GLWSP/SSAPlan/*
- Dane County, Wisconsin's BUILD program offers incentives for infill development and removes barriers to redevelopment in order to preserve farmland and prevent greenfield development: *http://www.countyofdane.com/plandev/Community/build/about.asp*
- U.S. EPA and Land-of-Sky Regional Council in Asheville, North Carolina developed a report outlining market, policy, and regulatory changes that can help overcome the barriers to infill and brownfield redevelopment: *http://www.epa.gov/dced/pdf/losrc_brownfields.pdf*
- The Oregon Transportation and Growth Management Program prepared a Model Infill Ordinance to clarify legal and policy-related questions about local infill incentives: *http://www.dca.state.ga.us/intra_nonpub/Toolkit/ModelOrdinances/ModOrdInfi.pdf*
- The City of Sacramento, California's Infill Strategies includes a Water Development Fee Waiver, Reduced Entitlement Fees, and Sewer Facility Fee Reductions: *http://www.cityofsacramento.org/planning/infill/*
- Phoenix, Arizona's Infill Housing Program provides incentives to encourage single-family housing on vacant and underutilized land and offers high density development standards: *http://www.ci.phoenix.az.us/BUSINESS/infilpgm.html*
- Portland, Oregon's Infill Design website provides design strategies for integrating infill development into medium-density neighborhoods: *http://www.portlandonline.com/bps/index.cfm?c=34024*
- Portland, Oregon's Ecoroof Floor Area Ratio (FAR) Bonus allows developers to increase a building's footprint or floor area by adding an ecoroof: *http://www.portlandonline.com/bes/index.cfm?a=236916&c=48725*
- The Georgia Quality Growth Partnership's Infill Development Program outlines a comprehensive infill strategy that includes incentives, improvements to public facilities, streamlined regulations, and guidelines for the design, density, and location of infill projects: *http://www.georgiaqualitygrowth.com/ToolDetail.asp?GetTool=32*
- Santa Cruz, California's Accessory Dwelling Unit Development Program encourages well-designed rental housing in the developed core of the City while being careful to discourage poorly-constructed illegal residential additions: *http://www.ci.santa-cruz.ca.us/pl/hcd/ADU/adu.html*
- Clark County, Washington's Infill Development Incentives include a waiver of all stormwater requirements for infill projects that create less than 5,000 square feet of new impervious surface: *http://www.clark.wa.gov/commdev/documents/devservices/handouts/46-infill.pdf*
- San Diego, California offers expedited permitting for eligible affordable/infill housing projects: *http://www.sandiego.gov/development-services/industry/pdf/infobulletin/ib538.pdf*

3 Design Complete, Smart Streets That Reduce Overall Imperviousness

3.A Street Design

3.A.1

QUESTION: Do local street design standards and engineering practices encourage streets to be no wider than necessary to move traffic effectively?

Do street designs vary according to:

- **street type** (arterial streets, collector streets, neighborhood streets) and
- **urban context** (urban core, transit station area, suburban center, general suburban, rural)?

Do policies allow narrow neighborhood streets designed to slow traffic and create safer conditions for pedestrians and bicyclists?

GOAL: Appropriate street widths allow narrower lanes for certain street types, thereby reducing overall imperviousness.

WHY: The width of travel lanes, parking lanes and sidewalks should be tailored to the urban setting. Where appropriate, narrowing travel lane width to 10-11 feet, rather than the standard 12-13 feet, can significantly reduce the total amount of impervious surfaces. Such streets can also substantially improve conditions for walking, biking, and using transit, which reduces automobile use and overall demand for parking spaces.

Implementation Tools and Policies	Pts. Avail.	Pts. Rec. or N/A	Notes and Local References
ADOPT PLANS/EDUCATE:			
Comprehensive plan/transportation plan emphasizes alternative modes of transportation (walking, biking, and transit) to reduce vehicle miles traveled and width and prominence of roads/streets.	1		
Comprehensive/transportation plan calls for distributing traffic across several parallel streets, reducing the need for high capacity streets with wide rights-of-way.	1		
Comprehensive/transportation planning process brings emergency response and other local government departments (e.g., public works, utilities) to the table early in the process to discuss street design.	1		
Adopt formal bicycle/pedestrian master plan.	1		
Create "safe routes to school" programs or other pedestrian/bike safety initiatives.	1		
Make consistent improvements to walking/biking conditions or develop a formal bicycle/pedestrian master plan.	1		
REMOVE BARRIERS:			
Comprehensive plan endorses context-sensitive street design with narrower streets in appropriate locations.	1		
Improve pedestrian crossing at intersections to encourage walking.	1		
Consolidate utilities in street right-of-way to improve sidewalk design and function.	1		
		PAGE TOTAL	◄ CARRY THIS SUBTOTAL TO NEXT PAGE = _____

Implementation Tools and Policies	Pts. Avail.	Pts. Rec. or N/A	Notes and Local References
Negotiate with state department of transportation or county transportation department to allow different design standards for regional roads passing through downtowns or other key areas.	1		
Promote street standards for fire safety that include attributes of narrow streets (20 feet widths) while identifying factors relevant to local government departments involved with streets such as public works, engineering, and utilities.	2		
Take formal control of state or county roads within city boundaries to ensure power over design and operations.	2		
ADOPT INCENTIVES:			
Developments that provide comprehensive pedestrian/bicycle circulation systems allowed reducing number of vehicle parking spaces. (See parking section below for greater detail.)	1		
Developments with approved comprehensive mobility/transportation plans allowed building narrower, less costly streets and alleys.	1		
ENACT REGULATIONS:			
Revamp local government technical street specifications to allow context-sensitive, innovative street design with narrower travel lanes, without curb and gutter, etc., in appropriate circumstances (See Institute of Transportation Engineers Recommended Practice document below).	2		
Emergency response professionals and other local government departments involved with streets (e.g. public works, engineering, utilities) have endorsed or adopted design standards for narrower neighborhood streets.	1		
Development review process involves emergency response early on to reach consensus on appropriate project street design and access.	1		
Development review process requires submittal of project pedestrian/bicycle circulation plans with safe street routes and other pedestrian/bicycle-friendly features in addition to traffic circulation plans for larger developments.	1		
Apply formal connectivity index[7] or other measures to ensure adequate internal street and pedestrian/bicycle connections.	2		
Zoning/subdivision regulations require minimum number of connections between new project and surrounding developments and neighborhoods.	2		
		PAGE TOTAL	SUBTOTAL FROM PREVIOUS PAGE + _____ = _____ ▼ CARRY THIS SUBTOTAL TO NEXT PAGE

[7] Connectivity index refers to the directness of links and the density of connections in path or road network. A well-connected road or path network has many short links, numerous intersections, and minimal dead-ends (cul-de-sacs). As connectivity increases, travel distances decrease and route options increase, allowing more direct travel between destinations, and creating a more ***Accessible*** and ***Resilient*** system. Source: Online Travel Demand Management Encyclopedia, ***http://www.vtpi.org/tdm/tdm116.htm***

3.A.2				
	QUESTION: Are shared driveways, reduced driveway widths, two-track driveways, and rear garages and alleys encouraged for all single-family developments?			
	GOAL: Encourage alternative forms and decreased dimensions of residential driveways and parking areas.			
	WHY: Off-street parking and driveways contribute significantly to the impervious areas on a residential lot. Reducing such dimensions can minimize the amount of stormwater runoff from a site.			
	REMOVE BARRIERS:			
	Allow developments that utilize shared driveways and rear-loaded garages to permit overnight parking in driveways and on-street.	1		
	Development code prohibits homeowner covenants forbidding overnight parking in driveways, on-street overnight parking, and shared driveways.	1		
	ADOPT INCENTIVES:			
	Allow developments with narrow driveways and rear-loaded garages to reduce number of parking spaces for guests.	1		
	Zoning/subdivision regulations require minimum number of connections between new project and surrounding developments and neighborhoods.	1		
	ENACT REGULATIONS:			
	Shared driveways are permitted or required for single-family residential developments.	1		
	Minimum widths for single-family driveways reduced to 9 feet.	1		
	Two-track driveways are allowed by technical street/subdivision specifications.	1		
	Single-family residential developments encouraged/required to be designed with minimum percentage of alley-accessible, rear-loading garages. - Alleys/garages encouraged = 1 points - Alleys/garages required = 2 points	1 to 2		
			PAGE TOTAL	SUBTOTAL FROM PREVIOUS PAGE + _____ ▼ CARRY THIS SUBTOTAL TO NEXT PAGE = _____

Green Infrastructure Elements and Street Design

QUESTION: Are major street projects required to integrate green infrastructure practices as a standard part of construction, maintenance, and improvement plans?

GOAL: Formally integrate green infrastructure into standard roadway construction and retrofit practice.

WHY: Consistent projects to improve or repair streets provide opportunities to include green infrastructure retrofits as part of larger project budget, design, and construction.

Implementation Tools and Policies	Pts. Avail.	Pts. Rec. or N/A	Notes and Local References
ADOPT PLANS/EDUCATE:			
Comprehensive/transportation plans promote green infrastructure practices in street design.	1		
Street project cost estimates include green infrastructure designs and assess cost savings from reduced hard infrastructure.	1		
REMOVE BARRIERS:			
Technical street specifications allow/require integration of green infrastructure elements into street project construction.	1		
Allow street-side swales to replace conventional curb and gutter for managing stormwater and for separating sidewalks from street traffic in appropriate circumstances.	1		
ADOPT INCENTIVES:			
Undertake consistent effort to secure state and federal funds (e.g., transportation enhancements) to pay for green infrastructure elements.	1		
Streets with green infrastructure count towards stormwater requirements.	1		
ENACT REGULATIONS:			
Adopt green infrastructure retrofit standards for major street projects.	1		
Adopt technical specifications and design templates for green infrastructure in private and public rights-of-way.	1		
All local road projects required to allocate a minimum amount of the total project cost to green infrastructure elements.	1		
		PAGE TOTAL	SUBTOTAL FROM PREVIOUS PAGE + _____ ▼ CARRY THIS SUBTOTAL TO NEXT PAGE = _____

QUESTION: Do regulations and policies promote use of pervious materials for all paving areas, including alleys, streets, sidewalks, crosswalks, driveways, and parking lots?

GOAL: Build and retrofit these surfaces with pervious materials to reduce stormwater runoff and its negative impacts.

NOTE: While eliminating sidewalks or placing sidewalks on only one side of the road can reduce impervious cover, this strategy is typically most appropriate for rural areas. However, other effective strategies can achieve the same runoff reductions that will not limit residents' options for recreation and transportation.

WHY: Streets, sidewalks, and other hard surfaces contribute a large portion to a municipality's total imperviousness. Making these impervious surfaces more permeable protects water quality, reduces flooding, and can recharge groundwater.

Implementation Tools and Policies	Pts. Avail.	Pts. Rec. or N/A	Notes and Local References
ADOPT PLANS/EDUCATE:			
Sponsor/approve pilot programs to determine appropriate pervious materials for different paving areas (e.g., permeable concrete for sidewalks, permeable pavers for driveways), as well as process for installation and maintenance.	1		
Pilot project results incorporated into standard practice for all new paved areas and retrofits of existing paved surfaces.	1		
Adopt policy to replace impervious materials with pervious materials where practical.	1		
REMOVE BARRIERS:			
Technical street specifications allow pervious paving materials in appropriate circumstances (e.g., not allowed over aquifer recharge areas).	1		
ADOPT INCENTIVES:			
Create formal program offering incentives (e.g., cost sharing, reduction in street widths/parking requirements, assistance with maintenance) to property owners who utilize pervious pavement elements.	1		
ENACT REGULATIONS:			
Adopt requirement that some percentage of parking lots, alleys, or roads in a development utilize pervious materials.	1		
Development approvals that allow/require use of pervious materials include requirements for continuing maintenance/cleaning of pervious surfaces.	1		

PAGE TOTAL

SUBTOTAL FROM PREVIOUS PAGE

▼ **Total score for SECTION 3: DESIGN COMPLETE, SMART STREETS THAT REDUCE OVERALL IMPERVIOUSNESS**

PAGE TOTAL + _____ = _____ (TOTAL POINTS AVAILABLE: 50)

This section has been reviewed and scored by _____

Department name _____ Signee _____

Resources

- Context Sensitive Solutions in Designing Major Urban Thoroughfares for Walkable Communities, Institute of Transportation Engineers: *http://www.ite.org/css/* (Ch. 6, pages. 65-87)
- "Neighborhood Street Design Guidelines: An Oregon Guide for Reducing Street Widths," Oregon Department of Transportation and Department of Land Conservation and Development: *http://www.oregon.gov/LCD/docs/publications/neighstreet.pdf*
- University of California, Davis Sustainable Transportation Center Sustainable Streets Project: *http://stc.ucdavis.edu/outreach/ssp.php*
- New York High Performance Infrastructure Guidelines: *http://www.designtrust.org/pubs/05_HPIG.pdf*
- Stormwater Guidelines for Green, Dense Redevelopment: Stormwater Quality Solutions for the City of Emeryville: *http://www.ci.emeryville.ca.us/planning/pdf/stormwater_guidelines.pdf*
- "Sustainable Green Streets and Parking Lots Design Guidebook," San Mateo County, California Water Pollution Prevention Program: *http://www.flowstobay.org/ms_sustainable_streets.php*
- Green Streets: Innovative Solutions for Stormwater and Stream Crossings, Portland Metro: *http://www.oregonmetro.gov/index.cfm/go/by.web/id=26335*
- Green Highways Partnership between U.S. EPA, U.S. Federal Highway Administration and Maryland State Highway Administration: *http://www.greenhighways.org/*
- Protecting Water Quality with Smart Growth Strategies and Natural Stormwater Management in Sussex County, Delaware: *http://www.epa.gov/smartgrowth/pdf/2009_0106_sussex_county.pdf*
- Promoting Sustainable Transportation Through Site Design: An Institute of Transportation Engineers Proposed Recommended Practice: *http://www.cite7.org/Technical_Projects/Final%20Proposed%20Recommended%20Practice%20RP-035.pdf*
- Transportation is about Places, Project for Public Spaces: *http://www.pps.org/transportation/*

Case Studies

- The Road Ecology Center at the University of California, Davis conducts research and develops policies to design transportation systems that minimize the impacts of roads on landscapes and communities: *http://roadecology.ucdavis.edu/*
- Houston, Texas's Urban Corridor Planning changes development regulations and infrastructure standards to support transit ridership and walkability in key corridors: *http://www.houstontx.gov/planning/Urban/urban_cor.html*
- San Francisco, California's Better Streets Plan created a common set of standards and guidelines for designing, building and maintaining more pedestrian friendly sidewalks, crosswalks, and roadways, including extensive greening: *http://www.sfbetterstreets.org*
- Portland, Oregon's Green Streets Program includes design specifications for swales, planters and curb extensions, creative funding for projects that treat runoff from public rights-of-way, case studies, tours, and videos of public and private green street projects: *http://www.portlandonline.com/BES/index.cfm?c=44407*
- Seattle, Washington's Right-of-Way Improvements Manual outlines the requirements and permitting process for right-of-way improvements, as well as provides specific design criteria and model templates for submitting street design concepts: *http://www.seattle.gov/transportation/rowmanual/*
- Florida Department of Transportation developed Model Regulations and Plan Amendments for Multimodal Transportation Districts, including regulation changes related to traffic calming, parking, sidewalks and pedestrian and bicycle facilities, and incentives for developments located in multimodal transportation districts: *http://www.dot.state.fl.us/planning/systems/sm/los/pdfs/MMTDregs.pdf*
- New York Department of Transportation's Sustainable Streets Strategic Plan includes an initiative to retrofit underused roads into public plazas, streamlining design review for capital projects, and goals to connect tree pits for better surface drainage, among other stormwater management improvements: *http://www.nyc.gov/html/dot/html/about/stratplan.shtml*
- Chicago, Illinois's Green Alley Program retrofits existing alleys with permeable pavement for better stormwater management, localized flood mitigation, heat reduction, material recycling, and energy conservation: *http://egov.cityofchicago.org/webportal/COCWebPortal/COC_EDITORIAL/GreenAlleyHandbook.pdf*

- North Carolina Department of Environment and Natural Resources offers guidance to developers on eliminating curbs and gutters, including siting and design considerations, maintenance concerns, effectiveness and cost considerations: *http://www.p2pays.org/ref/41/40403.pdf*
- New York City requires street trees for every 25 feet of street frontage of a zoning lot: *http://www.nyc.gov/html/dcp/pdf/street_tree_planting/tree_adopted_cc_043008.pdf*, page 8.
- Seattle Public Utilities' Natural Drainage System projects redesign residential streets to include vegetated drainage systems that use swales, wetlands, trees and other natural features to treat pollutants and minimize the speed and volume of road runoff: *http://www.seattle.gov/util/About_SPU/Drainage_&_Sewer_System/Natural_Drainage_Systems/*

4 Encourage Efficient Parking

4.A Reduced Parking Requirements

4.A.1

QUESTION: Does your local government provide flexibility regarding alternative parking requirements (e.g., shared parking, off-site parking) and discourage over-parking of developments?

Do parking requirements vary by zone to reflect places where more trips are on foot or by transit?

GOAL: Match parking requirements to the level of demand and allow flexible arrangements to meet parking standards.

WHY: Inflexible parking requirements that do not allow for alternative approaches, as well as standards that require too much parking for specific uses increase the amount of impervious surface in a development. Over-parking a development also encourages greater vehicle use and detracts from the overall pedestrian environment.

Implementation Tools and Policies	Pts. Avail.	Pts. Rec. or N/A	Notes and Local References
ADOPT PLANS/EDUCATE:			
The comprehensive plan recognizes the advantages to reduced parking requirements generally and specifically for mixed-use and transit-oriented developments.	1		
The comprehensive plan recommends alternative, flexible approaches to meeting parking demands (e.g., shared parking, counting on-street spaces towards site parking requirements).	1		
Comprehensive/bicycle plans recommend provision of bicycle parking spaces/storage lockers and concomitant reduction in vehicle parking space requirements.	1		
REMOVE BARRIERS:			
Allow flexibility in meeting parking space requirements through shared parking, off-site parking, and similar approaches.	1		
Permit businesses with different peak demand periods to share their required parking spaces.	1		
ADOPT INCENTIVES:			
Permit reduction in vehicle parking spaces through the provision of a minimum number of bicycle parking spaces.	1		
Allow by-right reduction in required parking spaces (e.g., 25%) in mixed-use and transit-oriented developments and districts.	1		
Permit developers to undertake parking studies to establish that specific developments (e.g., senior housing, affordable housing) require fewer parking spaces than typical projects.	1		
		PAGE TOTAL	◄ CARRY THIS SUBTOTAL TO NEXT PAGE = _____

Implementation Tools and Policies	Pts. Avail.	Pts. Rec. or N/A	Notes and Local References
Create parking districts to finance/construct centralized parking lots/ structures as shared parking facilities to reduce on-site parking.	1		
ENACT REGULATIONS:			
Revise parking regulations to reduce minimums below standard ITE (Institute of Transportation Engineers) requirements based on analysis of local developments and actual parking demand/experience.	2		
Charge developers for every space beyond parking minimums to offset environmental impacts.	1		
Enact parking standards that allow credit for adjacent on-street parking.	1		
Create zones with reduced parking requirements (e.g., transit overlay districts, mixed-use activity centers, multi-modal districts).	1		
Waive all parking minimums in downtown and other locations that are pedestrian-oriented and/or have good transit access.	1		
Adopt parking standards that reduce requirements based on sliding scale tied to degree of walkability/transit access locations (20% reduction in areas well served by bus, 30% reduction in areas served by rail stations).	1		
Require shared parking agreements where appropriate complementary uses exist.	1		
Adopt maximum parking caps (e.g., 125% above minimum) for multi-family and commercial developments.	2		
Reduce minimum parking space size based on analysis of average vehicle size in jurisdiction.	1		
		PAGE TOTAL	SUBTOTAL FROM PREVIOUS PAGE + _____ ▼ CARRY THIS SUBTOTAL TO NEXT PAGE = _____

4.B Transportation Demand Management Alternatives

4.B.1

QUESTION: Can developers use alternative measures such as transportation demand management or in-lieu payments to reduce required parking?

GOAL: Provide flexibility to reduce parking in exchange for specific actions that reduce parking demands on site.

WHY: Incentives such as transit passes, vanpool arrangements, flexible work schedules, market-priced facilities, and separate leasing for spaces in apartments and condominiums have quantifiable impacts on parking demand. Incorporating them into parking requirements creates the opportunity to meet demand with less impervious cover.

Implementation Tools and Policies	Pts. Avail.	Pts. Rec. or N/A	Notes and Local References
ADOPT PLANS/EDUCATE:			
Comprehensive/transportation plans recognize transportation demand management as an approach to reducing vehicle miles traveled and parking requirements.	1		
REMOVE BARRIERS:			
Rather than include parking spaces with an apartment lease, allow tenants to opt-out by treating parking as a separate optional lease agreement.	1		
ADOPT INCENTIVES:			
Allow businesses that offer employee transit passes, provide vans for employee commuting, allow flexible working arrangements, or charge market rates for parking to 1) provide fewer parking spaces or 2) pay less into a parking district fund for required parking spaces.	2		
Allow developers to make in-lieu fee payments for parking. Fees utilized by local government/parking authority to provide off-site parking lots/structures.	1		
Provide mechanisms for car sharing in transit-oriented development. Where done, area parking requirements are reduced.	1		
ENACT REGULATIONS:			
Create a parking district and allow/require businesses to support public garages rather than provide their own on-site parking.	1		
Require large developments to adopt transportation demand management techniques to lower vehicle use and parking demand.	1		
		PAGE TOTAL	SUBTOTAL FROM PREVIOUS PAGE + _____ ▼ CARRY THIS SUBTOTAL TO NEXT PAGE = _____

4.C Minimize Stormwater From Parking Lots

4.C.1

QUESTION: Are there requirements for landscaping designed to minimize stormwater in parking lots?

GOAL: Require substantial landscaping to help reduce runoff.

WHY: Parking lots generate a large amount of impervious cover. Requiring landscaping reduces the environmental impact of parking and can provide additional community benefits by providing shade and, if appropriately placed, creating natural barriers between pedestrians and cars.

Implementation Tools and Policies	Pts. Avail.	Pts. Rec. or N/A	Notes and Local References
ADOPT PLANS/EDUCATE:			
Comprehensive plan calls for landscaping in parking lots to help reduce stormwater runoff.	1		
REMOVE BARRIERS:			
Allow alternative or innovative landscaping solutions that provide stormwater management functions to count towards perimeter or other landscaping requirements.	1		
ADOPT INCENTIVES:			
Parking lot landscaping and green roofs on parking structures credited towards meeting local stormwater management requirements.	1		
Give additional landscaping credit for preservation of large, mature trees within parking lots.	1		
Do not count parking structures with green roofs against the allowable floor area ratio of a site.	1		
ENACT REGULATIONS:			
Adopt parking lot landscape regulations that require provision of trees, minimum percent of parking lot interior area to be landscaped (e.g., 10%), and minimum sized landscaping areas (e.g., minimum of 25 square feet for island planting areas).	1		
In parking lot landscaping regulations, specify the types and sizes of shrubs and trees most appropriate for controlling/reducing stormwater runoff.	1		
Adopt standards requiring a minimum area of the parking lot to drain into landscaped areas.	1		
Require the management of runoff from parking lots through green infrastructure practices, including trees, vegetated islands, swales, rain gardens, or other approaches.	1		
		PAGE TOTAL	SUBTOTAL FROM PREVIOUS PAGE: + _____ ▼ CARRY THIS SUBTOTAL TO NEXT PAGE = _____

Implementation Tools and Policies	Pts. Avail.	Pts. Rec. or N/A	Notes and Local References
Enact specific alternative landscaping and parking regulations to support infill development (parking requirements, parking lot landscaping options that focus on perimeter landscaping to encourage smaller lots, etc.).	2		
Require parking structures to incorporate green roofs to reduce stormwater runoff.	1		
Reduce drive aisle widths in parking lots to decrease the amount of pervious surface. For multi-family developments, drive aisles can be shared. In commercial developments, typical drive aisles can be reduced 5–10%.	1		

PAGE TOTAL

SUBTOTAL FROM PREVIOUS PAGE + _____ = _____ ▼ **Total score for SECTION 4: ENCOURAGE EFFICIENT PARKING**

(TOTAL POINTS AVAILABLE: **41**)

This section has been reviewed and scored by _____

Department name: _____ Signee: _____

Resources

- "Parking Spaces/Community Places: Finding the Balance through Smart Growth Solutions" (pg. 14, 18-19, 21), U.S. EPA Development, Community and Environment Division: *http://www.epa.gov/piedpage/pdf/EPAParkingSpaces06.pdf*
- "Shared Parking, Second Edition," Urban Land Institute: *www.uli.org/bookstore/*
- "Developing Parking Policies to Support Smart Growth in Local Jurisdictions: Best Practices," Metropolitan Transportation Commission: *http://www.mtc.ca.gov/planning/smart_growth/parking_study/April07/bestpractice_042307.pdf*
- "Driving Urban Environments: Smart Growth Parking Best Practices," Maryland Governor's Office of Smart Growth: *http://www.smartgrowth.state.md.us/pdf/Final%20Parking%20Paper.pdf*
- "Design Principles for Parking Lots," Tennessee Valley Authority Economic Development: *http://www.tvaed.com/sustainable/parking.htm*
- Efficient Parking Strategies, Centralina Council of Governments and Catawba Regional Council of Governments: *http://www.epa.gov/region4/airqualitytoolkit/9_CaseStudies/SEQL%20-%20Efficient%20Parking%20Strategies.pdf*
- "Parking Management: Strategies, Evaluation and Planning," Victoria Transport Policy Institute: *http://www.vtpi.org/park_man.pdf*
- "Smart Growth Alternatives to Minimum Parking Requirements," *Proceedings from the 2nd Urban Street Symposium*, July 28-30, 2003: *http://transtoolkit.mapc.org/Parking/Referenced_pdfs/Forinash_SmartGrowthParkingAlternatives.pdf*
- "Flexible Parking Standards," Georgia Quality Growth Partnership: *http://www.dca.state.ga.us/toolkit/ToolDetail.asp?GetTool=17*
- "Multifunctional Landscaping: Putting Your Parking Lot Design Requirements to Work for Water Quality," University of Illinois Extension: *http://urbanext.illinois.edu/lcr/LGIEN2002-0017.html*
- "Low-Impact Parking Lot Design Reduces Runoff and Pollutant Loads," Journal of Water Resources Planning and Management, 2001: *http://cedb.asce.org/cgi/WWWdisplay.cgi?0101775*
- "Managing Stormwater for Urban Sustainability Using Trees and Structural Soils," Virginia Polytechnic Institute and State University: *http://www.cnr.vt.edu/urbanforestry/stormwater/Resources/TreesAndStructuralSoilsManual.pdf*

Case Studies

- San Mateo County, California's "Sustainable Green Streets and Parking Lots Design Guidebook" provides policy guidance and design and construction details, including site layout strategies, green infrastructure design guidelines and case studies for both streets and parking lots. *http://www.flowstobay.org/ms_sustainable_streets.php*
- Minneapolis, Minnesota's zoning code includes regulations to support pedestrian-oriented off-street parking, including parking maximums, shared parking allowances, pedestrian-overlay districts with reduced parking requirements, replacing off-street parking spaces with bicycle racks, and more: *http://www.ci.minneapolis.mn.us/lrtrezoning/tod-haiwatha-09.asp*
- Boston Metropolitan Area Planning Council gives detailed guidance for reducing parking demand and developing parking requirements based on local factors such as access to transit, expected demographics, auto ownership rates and access to destinations and transit service: *http://transtoolkit.mapc.org/Parking/Strategies/flexiblerequirements.htm*
- San Diego, California's Community Parking District Program helps older commercial districts collect revenue and implement parking plans to construct public parking facilities, make public transit enhancements, and maximize off-street parking inventory: *http://www.sandiego.gov/economic-development/business-assistance/small-business/pmd.shtml*
- Placer County, California enacted an In-Lieu Parking Fee that allows developments within specific parking districts to pay a fee in lieu of complying with off-street parking standards. The collected fees are then used to construct new public parking spaces within the same parking district: *http://www.placer.ca.gov/Departments/Works/TahPkngStudy/DraftParkingFeeOrdinance.aspx*
- Minnesota's Urban Small Sites Best Management Practice Manual provides drawings, design guidelines and plant lists for impervious surface reduction in parking lot design: *http://km.fao.org/uploads/media/Impervious_surface_reduction_parking_lot_desing.pdf*
- The retrofit of Our Lady Gate of Heaven Parish parking lot in Chicago, Illinois included a large swale that absorbs 100,000 gallons of runoff per year, reducing flooding in the parking lot and in nearby streets and properties. This U.S. EPA-funded project continues to be monitored for

performance data: *http://www.cnt.org/natural-resources/demonstration-projects/olgh-case-study*

- The Florida Aquarium Parking Lot and Queuing Garden in Tampa, Florida maximizes existing site vegetation for stormwater management and provides education to Aquarium visitors. This website includes construction cost information, lessons learned, monitoring results and maintenance protocols: *http://www.sustainablesites.org/cases/show.php?id=16*
- Several parking lot demonstration sites in Blacksburg, VA, Ithaca, NY and Davis, CA provide details about newly constructed parking lots and retrofitted lots that include trees, structural soils and pervious pavements for managing stormwater: *http://www.cnr.vt.edu/urbanforestry/stormwater/DemonstrationSites.html*

5 ADOPT GREEN INFRASTRUCTURE STORMWATER MANAGEMENT PROVISIONS

5.A GREEN INFRASTRUCTURE PRACTICES

5.A.1

QUESTION: Are green infrastructure practices encouraged as legal and preferred for managing stormwater runoff?

GOAL: Make all types of green infrastructure allowed and legal and remove all impediments to using green infrastructure (including for stormwater requirements), such as limits on infiltration in rights-of-way, permit challenges for green roofs, safety issues with permeable pavements, restrictions on the use of cisterns and rain barrels, and other such unnecessary barriers.

WHY: Green infrastructure approaches are more effective and cost efficient than conventional stormwater management practices in many instances, and provide other substantial community benefits.

Implementation Tools and Policies	Pts. Avail.	Pts. Rec. or N/A	Notes and Local References
ADOPT PLANS/EDUCATE:			
Inform the public, through education and outreach programs, that green infrastructure practices can manage stormwater runoff on their property.	1		
Create a green infrastructure workshop or training program for internal and external reviewers to ensure that the stakeholders who use this tool will have the ability to understand and use it effectively.	1		
REMOVE BARRIERS:			
Development and other codes encourage and allow property owners to adopt home-based green infrastructure practices, such as rain gardens, rain barrels, and other rainwater harvesting practices.	1		
Review and change, where necessary, building codes or other local regulations to ensure that all local government departments/agencies have coordinated with one another to ensure that green infrastructure implementation is legal, e.g. remove restrictions on downspout disconnection.	1		
ADOPT INCENTIVES:			
Credit green infrastructure practices towards required controls for stormwater runoff.	1		
Establish a "Green Tape" expedited review program for applications that include green infrastructure practices.	1		
Reduce stormwater utility rates based on the use of green infrastructure practices.	1		
		PAGE TOTAL	◄ CARRY THIS SUBTOTAL TO NEXT PAGE = _____

Implementation Tools and Policies	Pts. Avail.	Pts. Rec. or N/A	Notes and Local References
ENACT REGULATIONS:			
Zoning and subdivision regulations specifically permit green infrastructure facilities, including but not limited to: (1 point for each technique to a maximum of 4 points) Green roofs; Infiltration approaches, such as rain gardens, curb extensions, planter gardens, permeable and porous pavements, and other designs where the intent is to capture and manage stormwater using soils and plants; Water harvesting devices, such as rain barrels and cisterns; and Downspout disconnection	1 to 4		
Developers are required to meet stormwater requirements using green infrastructure practices where site conditions allow. Developers must provide documentation for sites that do not allow on-site infiltration, reuse, or evapotranspiration to meet locally determined performance stormwater management standards.	1 to 2		
		PAGE TOTAL	SUBTOTAL FROM PREVIOUS PAGE + _____ ▼ CARRY THIS SUBTOTAL TO NEXT PAGE = _____

5.A.2		
	QUESTION:	Do stormwater management plan reviews take place early in the development review process?
	GOAL:	Incorporate stormwater plan comments and review into the early stages of development review/site plan review and approval, preferably at pre-application meetings with developers.
	WHY:	Pre-site plan review is an effective tool for discussing with developers alternative approaches for meeting stormwater requirements. This will incorporate green infrastructure techniques into new projects at early design stages, well before construction begins.

Implementation Tools and Policies	Pts. Avail.	Pts Rec. or N/A	Notes and Local References
ADOPT PLANS/EDUCATE:			
Encourage/require a pre-site plan meeting with developers to discuss stormwater management and green infrastructure approaches Voluntary = 1 point Mandatory = 2 points	1 to 2		
Include landscape architects in design and review of stormwater management plans.	1		
ADOPT INCENTIVES:			
Provide accelerated review of projects where developer attended a pre-application meeting.	1		
ENACT REGULATIONS:			
Preliminary stormwater plan review occurs contemporaneously with preliminary site plan review and before any development approvals.	1		
Development applications must include preliminary/conceptual stormwater management plans that incorporate green infrastructure elements and describe how stormwater management standards will be met.	1		
		PAGE TOTAL	SUBTOTAL FROM PREVIOUS PAGE + _____ = ▼ CARRY THIS SUBTOTAL TO NEXT PAGE _____

5.A.3	
	QUESTION: Do local building and plumbing codes allow harvested rainwater for exterior uses, such as irrigation, and non-potable interior uses, such as toilet flushing?
	GOAL: Ensure that the municipality allows and encourages stormwater reuse for non-potable uses.
	WHY: Stormwater reuse is important for dense, urban areas with limited spaces for vegetated green infrastructure practices.

Implementation Tools and Policies	Pts. Avail.	Pts. Rec. or N/A	Notes and Local References
ADOPT PLANS/EDUCATE:			
Local government provides information brochures/manual for homeowners describing acceptable rainwater harvesting techniques.	1		
REMOVE BARRIERS:			
Local development, building, and plumbing codes updated to allow reuse of stormwater for non-potable purposes.	1		
ADOPT INCENTIVES:			
Reduce stormwater management facility requirements for developments employing comprehensive rainwater harvesting.	1		
Reduce stormwater utility rates based on the use of harvest and reuse techniques.	1		
ENACT REGULATIONS:			
Require developments to adopt rainwater harvesting techniques as elements of stormwater management plans.	1		
		PAGE TOTAL	SUBTOTAL FROM PREVIOUS PAGE + _____ ▼ CARRY THIS SUBTOTAL TO NEXT PAGE = _____

5.A.4		
	QUESTION:	Are provisions available to meet stormwater requirements in other ways, such as off-site management within the same sewershed or "payment in lieu" of programs, to the extent that on-site alternatives are not technically feasible?
	GOAL:	Allow off-site management of runoff while still holding developers responsible for meeting stormwater management goals.
	WHY:	In some cases, it is impracticable or infeasible to treat all or even some of the stormwater runoff on site. In such instances, alternative means should be provided through contribution to off-site mitigation projects or off-site stormwater management facilities (preferably green infrastructure facilities).

Implementation Tools and Policies	Pts. Avail.	Pts. Rec. or N/A	
For infill and redevelopment areas, off-site green stormwater management plans should be developed in cooperation between local government and landowners/developers. Allowing off-site management of stormwater runoff requires sewershed designation within the local government to ensure that true mitigation is possible and realize the equal stormwater management and water quality benefits through off-site management.	2		
Retrofit projects that will utilize green infrastructure stormwater management techniques should be identified and prioritized within the sewershed.	1		
Amend stormwater management regulations and development codes as necessary to allow off-site stormwater management, especially for infill and redevelopment areas.	1		
Establish system that allows/requires payment-in-lieu fees for off-site stormwater management facilities. Fees should be set sufficiently high as to cover the true cost of off-site management. Consider limitations on amount of off-site management allowed (more for infill areas, less for greenfield sites).	1		
		PAGE TOTAL	SUBTOTAL FROM PREVIOUS PAGE + _____ ▼ CARRY THIS SUBTOTAL TO NEXT PAGE = _____

5.B.1

QUESTION: Does your stormwater ordinance include monitoring, tracking, and maintenance requirements for stormwater management practices?

GOAL: Incorporate monitoring, tracking, and maintenance requirements for stormwater management practices into your municipal stormwater ordinance.

WHY: These measures will help ensure that the successful tracking and monitoring of green infrastructure practices remain in proper working condition to provide the performance required by the stormwater ordinance.

Implementation Tools and Policies	Pts. Avail.	Pts. Rec. or N/A	Notes and Local References
ADOPT PLANS/EDUCATE:			
Develop a system to monitor and track stormwater management practices deployed at greenfield and redevelopment sites. Tracking of management practices should begin during the plan review and approval process with a database or geographic information system (GIS). The database should include both public and private projects.	1		
Provide model checklist for maintenance protocols for ease of inspection, tracking, and enforcement.	1		
Sponsor demonstration projects for green infrastructure management best practices.	1		
REMOVE BARRIERS:			
Ensure that proper local agencies have authority to enforce maintenance requirements.	1		
ADOPT INCENTIVES:			
Create self-inspection maintenance certification program that allows developers/landowners to train/retain private inspectors to certify compliance with stormwater management plans and long-term maintenance.	1		
ENACT REGULATIONS:			
Require long-term maintenance agreements that allow for public inspections of the management practices and account for transfer of responsibility in leases and/or deed transfers.	1		
Conduct inspections every 3 to 5 years, prioritizing properties that pose the highest risk to water quality, inspecting at least 20% of approved facilities annually.	1		
Develop a plan approval and post-construction verification process to ensure compliance with stormwater standards, including enforceable procedures for bringing noncompliant projects into compliance.	1		
		PAGE TOTAL	SUBTOTAL FROM PREVIOUS PAGE + _____ ▼ CARRY THIS SUBTOTAL TO NEXT PAGE = _____

Implementation Tools and Policies	Pts. Avail.	Pts. Rec. or N/A	Notes and Local References
Inspections of construction sites occur at for at least 25% of permitted projects to ensure proper installation of approved practices.	1		
Require conservation/green infrastructure bond/escrow in zoning/subdivision ordinances to ensure installation/maintenance of green infrastructure storm water management facilities.	1		

PAGE TOTAL

SUBTOTAL FROM PREVIOUS PAGE

+ _____ = _____ (TOTAL POINTS AVAILABLE: 39)

▼ **Total score for SECTION 5: GREEN INFRASTRUCTURE STORMWATER MANAGEMENT PROVISIONS**

This section has been reviewed and scored by _____

Department name _____ Signee _____

Resources

- Green Infrastructure Municipal Handbook, U.S. EPA Green Infrastructure website: *http://cfpub.epa.gov/npdes/greeninfrastructure/munichandbook.cfm*
- *A Catalyst for Community Land Use Change*, National NEMO Network 2008 Progress Report with local regulations for water quality protection: *http://nemonet.uconn.edu/about_network/publications/2008_report.htm*
- Public Entity Environmental Management System Resource Center: *http://peercenter.net/*
- Environmental Management System, U.S. EPA: *http://epa.gov/ems/*
- "The Economics of Low-Impact Development: A Literature Review," EcoNorthwest: *http://www.econw.com/reports/ECONorthwest_Low-Impact-Development-Economics-Literature-Review.pdf*
- "Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices," U.S. EPA Office of Water: *http://www.epa.gov/owow/nps/lid/costs07/*
- New York City's PlaNYC for Water: *http://www.nyc.gov/html/planyc2030/html/plan/water.shtml*
- Puget Sound Partnership Low Impact Development Local Regulation Assistance Project: *http://www.psparchives.com/our_work/stormwater/lid/lid_regs.htm*
- Massachusetts Low Impact Development Toolkit: *http://www.mapc.org/regional_planning/LID/PDFs/LID%20Local%20Codes%20Checklist.pdf*
- Plan Review checklist and flow chart, Office of Watersheds, Philadelphia Water Department: *http://www.phillyriverinfo.org/WICLibrary/DevelopmentProcess_Final.pdf*
- General Factors that Influence the Selection of Stormwater Management Facilities, Portland Bureau of Environmental Services: *http://www.portlandonline.com/shared/cfm/image.cfm?id=129055*
- Operations and Maintenance of Treatment Best Management Practices, Santa Clara Valley Urban Pollution Prevention Program: *http://www.scvurppp-w2k.com/om_workproduct_links.htm*
- Stormwater Center Maintenance Agreements Guidance and Case Studies: *http://www.stormwatercenter.net/Manual_Builder/Maintenance_Manual/4Maintenance_Agreements/Maintenance%20Agreements%20Introduction.htm*

Case Studies

- Alachua County, Florida's stormwater regulation requires that developers reduce impervious surfaces via vertical construction and alternative parking surfaces and use site contours and minimize disturbance to existing natural features: *http://growth-management.alachua.fl.us/compplanning/amended_docs/ORDstormCPA-06-01finaL.pdf*
- Philadelphia, Pennsylvania's stormwater regulation requires that projects infiltrate/manage the first 1" of rainfall from all directly connected impervious surfaces and exempts redevelopment projects from flood control and channel protection requirements: *http://www.phillyriverinfo.org/Programs/SubprogramMain.aspx?Id=Regulations*
- Portland, Oregon's stormwater requirement uses a mandatory hierarchy that requires on-site infiltration with surface vegetation above all other practices *http://www.portlandonline.com/bes/index.cfm?c=35122* (Chapter 1, page 1-18)
- Emeryville, California's stormwater guidelines for dense green redevelopment provide guidance on using green infrastructure in high density, infill sites: *http://ca-emeryville.civicplus.com/DocumentView.asp?DID=144*
- Portland, Oregon's Ecoroof Floor Area Ratio (FAR) Bonus allows developers to increase a building's footprint or floor area for projects that include an ecoroof: *http://www.portlandonline.com/bes/index.cfm?a=236916&c=48725*
- Chicago Department of Construction and Permits has a Green Permit Program that offers expedited permits and waived permit review fees for projects that meet a series of green building requirements, including exceptional water management and green roof criteria: *http://egov.cityofchicago.org/webportal/COCWebPortal/COC_EDITORIAL/GreenPermitBrochure1.pdf*
- Tucson, Arizona's Water Harvesting Guidance Manual describes how the City's code requirements for water harvesting help to meet several other local codes, such as for landscaping, floodplain and erosion hazard management, and stormwater management: *http://dot.tucsonaz.gov/stormwater/education/waterharvest.php* (page 26)
- San Francisco, California's Public Utilities, Department of Building Inspection and Department of Public Health partnered to allow the use of rainwater for irrigation and toilet flushing without requiring treatment to potable standards: *http://sfwater.org/mto_main.cfm/MC_ID/14/MSC_ID/361/MTO_ID/559*

- Seattle, Washington's Green Factor is an amended landscape requirement that property owners meet via a scoring system that encourages green features such as large plants, permeable pavement, green roofs, vegetated walls and tree preservation: *http://www.seattle.gov/dpd/permits/greenfactor/Overview/*
- San Jose, California's stormwater regulation requires that projects with 10,000 square feet or more of impervious surface area use landscape-based treatment and trees to meet quantity and quality standards: *http://www.sanjoseca.gov/planning/stormwater/Policy_6-29_Memo_Revisions.pdf*
- Santa Monica, California's stormwater code requires that new development projects maximize permeable areas, maximize runoff to permeable areas, reuse stormwater, and reduce parking lot pollution: *http://www.smgov.net/uploadedFiles/Departments/OSE/Categories/Urban_Runoff/UR_Brochure.pdf*
- Chicago, Illinois's stormwater regulation requires that new developments manage 0.5" runoff from all impervious surfaces or reduce imperviousness by 15%: *http://egov.cityofchicago.org/webportal/COCWebPortal/COC_EDITORIAL/StormwaterManagementOrdinance1206.pdf*
- Lenexa, Kansas's stormwater regulation requires new developments to manage 1.37" for water quality using a natural system treatment train approach and also charges a fee for water quantity management which pays for watershed-scale public projects managed by the City: *http://www.ci.lenexa.ks.us/LenexaCode/viewXRef.asp?Index=2927*
- Fauquier County, Virginia's stormwater maintenance agreements state that if maintenance is neglected the County has the authority to perform the work and recover costs from the property owner: *http://www.fauquiercounty.gov/documents/departments/commdev/pdf/SWMOrdinance.pdf* (pages 12-13)
- Philadelphia, Pennsylvania's Stormwater Management Guidance Manual provides maintenance guidelines and schedules for a range of green infrastructure practices, from green roofs to pervious pavements and subsurface infiltration: *http://www.phillyriverinfo.org/Programs/SubprogramMain.aspx?Id=StormwaterManual*

ACKNOWLEDGMENTS

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APPENDIX K

CITY OF LOS ANGELES DEPARTMENT OF BUILDING AND SAFETY GUIDELINES FOR STORMWATER INFILTRATION

APPENDIX

CITY OF LOS ANGELES
DEPARTMENT OF BUIDING AND
SAFETY GUIDELINES FOR
STORMWATER INFILTRATION

INFORMATION BULLETIN / PUBLIC - BUILDING CODE
REFERENCE NO.: LABC Sec 7013.9 & 7013.10 Effective: 01-01-2008
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GUIDELINES FOR STORMWATER INFILTRATION

This information bulletin provides guidelines for the design and acceptance of facilities to infiltrate storm water into the ground. Projects subject to the requirements of the Standard Urban Stormwater Mitigation Plan (SUSMP) are required by the Department of Public Works, Bureau of Sanitation to infiltrate stormwater runoff when geotechnically feasible. Infiltration facilities that are adjacent to buildings/structures are therefore required to be evaluated by a soils engineer. The findings of the soils engineer shall be contained in a report to be reviewed and approved by the Grading Division of the Los Angeles Department of Building and Safety (LADBS). Approvals from both the Grading Division and the Bureau of Sanitation (SUSMP clearance) are required before any permit can be issued. Additionally, when the site is located in the San Fernando Valley, the Bureau of Sanitation will not issue a SUSMP clearance until an approval is received from the Department of Water and Power, Upper Los Angeles River Area Watermaster.

The purpose of the soils engineers evaluation is to prevent the infiltration of stormwater from aggravating any soil or bedrock condition which could result in slope instability, settlement of footings, surcharge of retaining walls, or contributing water to subsurface de-watering devices such as basement or retaining wall backdrains. If approved by the Grading Division and the Bureau of Sanitation, the infiltration structure will be considered as an approved drainage facility, in compliance with Los Angeles Building Code (LABC) Sections 7013.9 and 7013.10.

DEFINITIONS

For the purpose of this bulletin, the following terms are defined:

1. ***Homogeneous Soils*** are soils with no discernable layering, structure, fabric, texture, or changes in soil type, either vertically or horizontally, that could affect the rate or direction of water movement.

2. ***Infiltration Facilities*** are the devices used to introduce stormwater into the ground. They may consist of gravel filled pits, trenches, dry wells, or various pre-manufactured products placed in the earth. The design of the infiltration facility shall be approved by the Bureau of Sanitation, Watershed Protection Division.

3. ***Zone of Saturation*** is the soil mass beneath an infiltration facility where the air voids in the soil have become filled with water.

As a covered entity under Title II of the Americans with Disabilities Act, the City of Los Angeles does not discriminate on the basis of disability and, upon request, will provide reasonable accommodation to ensure equal access to its programs, services and activities. For efficient handling of information internally and in the internet, conversion to this new format of code related and administrative information bulletins including MGD and RGA that were previously issued will allow flexibility and timely distribution of information to the public.

I. GENERAL REQUIREMENTS

1. A soil report is required to evaluate the effects of any proposed stormwater infiltration into the ground. The soils report approval letter from the Grading Division of Building and Safety shall be made a part of the approved plan.

   Exception: Where the infiltration facility is a minimum of 25 feet from all buildings, retaining walls, or property lines and whenever there is a basement beneath the building, the horizontal distance between a building and the infiltration facility is greater than 25 feet plus the depth of the basement, a soil report is not required.

2. Stormwater Infiltration is not allowed in the Hillside Grading Area as designated on the Bureau of Engineering Basic Grid Map No. A-13372. An exception may be made if it can be clearly demonstrated that the infiltrated stormwater can not possibly contribute to any groundwater that may affect the stability of slopes, either on, adjacent to, or distant from the site.

3. Stormwater infiltration is not allowed on any site where the water may saturate soils that are subject to liquefaction.

II. MINIMUM DESIGN REQUIREMENTS

The following design guidelines shall be considered as minimum requirements on sites where infiltration is found acceptable by the soils engineer and approved by the Grading Division. Subject to the findings of the soils investigation report, additional setbacks or design considerations may be required.

1. Water infiltration into the ground must occur a minimum of 10 feet above the groundwater table, unless otherwise approved by the Bureau of Sanitation.

2. The distance between the infiltration facility and the adjacent private property line shall be a minimum of 10 feet. Where subterranean walls or deep basements exist on the adjacent property, a greater setback or deeper infiltration system may be required to comply with the criteria in this bulletin.

3. Foundations shall be set back a minimum of 10 feet from the infiltration facility and the bottom of the footing shall be a minimum of 10 feet from the expected zone of saturation. Note: the boundary of the zone of saturation in homogenous soils may be assumed to project downward from the top of the permeable portion of the infiltration facility at a gradient of 1:1 or flatter, as determined by the soil engineer.

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4. Infiltration facilities shall not be located on a slope with a gradient greater than 20% (5:1 horizontal to vertical).

5. Infiltration facilities shall be located so that soils supported by retaining and basement walls are not saturated.

6. Dry wells adjacent to buildings shall be cased to a depth where the potential saturation zone is at least 10 feet from any footing. The annular space around the casing shall be sealed to prevent water from raising up the outside of the casing.

7. No infiltration facility shall be placed to infiltrate water into fill material.

8. Grassy swales shall be located at a minimum of 5 feet from any building and property line and should drain at a minimum of 2% gradient.

9. The infiltration facility shall be designed to overflow to the street in the event that the drainage capacity is exceeded or in case of future failure to adequately infiltrate.

10. Porous concrete or similar permeable hardscape materials are allowed to be used in the Hillside Grading Area, only where they will be subject to incidental rainfall and not where they would be subject to a concentrated flow of water such as from roof downspouts. Any hardscape design that impedes the flow of water over the ground surface is not acceptable.

III. SOIL REPORT CONTENT

When required by Section I.1, the soils engineer is to determine whether the site is suitable or unsuitable for the proposed infiltration facility. The soils report shall identify any soil/geologic conditions that could be adversely affected by water or that could influence the movement of water and make appropriate recommendations. The report shall be submitted to the Grading Division for review and approval prior to the issuance of any permit.

A. Reports For Sites Suitable For Infiltration

1. The soils report shall contain an opinion that the site is suitable for the proposed infiltration facility without increasing the potential for settlement of structures or adversely affecting retaining/basement walls located either on or adjacent to the subject site. The report shall contain the following:

    a. Map showing the locations of the proposed stormwater infiltration facility and all adjacent structures, either on or adjacent to the site.

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b. A finding as to the potential for creating perched water conditions that may adversely affect structures.

c. A finding as to the influence of the infiltration facility on the existing retaining walls. Infiltration facilities shall be located so that soil supported by retaining/basement walls is not saturated.

d. A finding as to the presence of expansive soils and influence of the infiltration on behavior of these soils in view of soil structure interaction.

e. A finding as to the susceptibility for hydro-consolidation, possibly resulting in distress to structures.

f. A finding as to the susceptibility for any ground settlements due to soil saturation from infiltration, possibly resulting in distress to structures.

2. The conclusions of the report shall include:

a. An opinion as to whether the site is suitable for stormwater infiltration.

b. An opinion that the infiltration of the stormwater will not result in ground settlement that could affect structures, either on or adjacent to the site.

c. An opinion that the infiltration of the stormwater will not result in soil saturation that could affect retaining/basement structures.

B. Reports For Sites Not Suitable for Infiltration

1. The soil report shall provide the reason why infiltration is not recommended. Reasons for finding the site not suitable may include, but need not be limited to, the following:

a. Depth to groundwater is less than 10 feet from the bottom of the infiltration pit/trench/well.

b. Impervious soils or bedrock with low infiltration rates that are not acceptable to the Bureau of Sanitation, Department of Public Works.

c. Findings that infiltration and soil saturation may cause settlement of the existing/proposed foundations or saturation of soil supported by retaining (basement) walls.

d. Infiltration water may saturate soils subject to liquefaction.

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APPENDIX L

GREEN INFRASTRUCTURE IDENTIFICATION OF BARRIERS AND OPPORTUNITIES CHECKLIST TOOL

Attachment A:

Green Infrastructure Identification of Barriers and Opportunities Checklist Tool



Photo: Elmer Avenue residential stormwater retrofits, Los Angeles, CA



Parking lot bioretention, Wilsonville, OR
(Photo credit: M. Frey)

The *Green Infrastructure Identification of Barriers and Opportunities Checklist Tool* is tailored to the Los Angeles Region's key priorities of infill development, redevelopment, and water conservation/reuse/recharge. The checklist was developed originally to perform audits of local codes and ordinances for local government clients based on experience with other checklists, such as the Center for Watershed Protection's *Codes and Ordinances Worksheet* and EPA's *Water Quality Scorecard*.

This tool is intended to be used by local governments in the Los Angeles region to determine whether their codes and ordinances pose barriers to green infrastructure practices and to highlight opportunities for green infrastructure to be encouraged or required in codes. For additional guidance on the code review process for local governments, see Section 5 of this report and the Center for Watershed Protection's *Better Site Design: A Handbook for Changing Development Rules in Your Community* (1998), which contains the Codes and Ordinances Worksheet mentioned above (see www.cwp.org for details).

The process of changing codes to encourage green infrastructure is not without challenges, most of which can be overcome through education and negotiations with other departments. It is very likely that municipal staff will have concerns about green infrastructure related to safety, access, and maintenance. For example, in an attempt to minimize impervious area, green infrastructure principles recommend narrower streets and cul-de-sacs and smaller parking areas. Often, fire departments and public works departments express concerns regarding safety and access, engineering departments object because of conflicts with the State Streets and Highway Code, and engineering and public works departments have concerns about maintenance of distributed BMPs, especially on private land and in public right-of way. Developers often have concerns about feasibility of green infrastructure BMPs if there is inflexibility in other code requirements.

GOAL #1: MINIMIZE EFFECTIVE OR CONNECTED IMPERVIOUS AREA

Objective: Minimize impervious area associated with streets, parking, driveways, and sidewalks; cluster development; and incorporate sustainable hydrology practices into urban redevelopment.

GOAL #1 KEY QUESTIONS	IMPORTANCE[10]	COMMENTS[11]
Effective Impervious Area		
1. Does the code distinguish between pervious paved areas and impervious paved areas in the determination of onsite stormwater requirements?	◑	
2. Does the code definition of impervious area distinguish between impervious area connected to the storm drain system (effective impervious area) and disconnected impervious area?	◑	
Streets		
1. For residential development and redevelopment, are the street pavement widths allowed to be between 18 to 22 feet, with curb pullouts for passing of large vehicles?	●	
2. Are travel lanes allowed to be from 12 to 10 feet (or less), with curb pullouts for passing of large vehicles?	●	
3. Are curb bumpouts/extensions allowed near intersections and mid-block for traffic-calming and bioretention opportunities?	◑	
4. Is pervious paving allowed for on-street parking and alleyways?	◑	
5. Are grass swales or bioretention swales allowed instead of curb and gutter or with curb cuts (where slopes allow)?	◑	
6. Are bioretention areas, swales, and other green infrastructure techniques allowed to replace the required "grass strip" or "parkway area" between the sidewalk and curb?	●	
7. If there are cul-de-sacs, is the radius required to be 35 feet or less?	○	
8. If there are cul-de-sacs or roundabouts, are landscaped islands or bioretention islands allowed or encouraged?	○	
9. Are site designs for development and redevelopment required to promote the most efficient street layout to reduce overall street length?	○	

[10] Degree of Importance Key to Symbols: ● Essential ◑ Very important ○ Important

[11] Indicate ordinance findings "yes" or "no." When "no," note specific location of barrier in code.

GOAL #1 KEY QUESTIONS	IMPORTANCE[10]	COMMENTS[11]
Parking		
1. Is the minimum stall width for a standard parking space 9 ft. or less?	●	
2. Are parking stall lengths allowed to be 15 ft.?	●	
3. Are parking lot drive aisles allowed to be 22 ft.?	◑	
4. Are bioretention cells allowed in parking medians?	●	
5. Are consolidated travel lanes and on-street parking allowed to create space for bioretention?	○	
6. Are pervious surfaces such as paver stones, porous pavement, or other pervious pavers allowed for on-street parking?	◑	
7. For office buildings, is the required parking ratio 3.0 spaces per 1,000 sq. ft. of gross floor area or less?	◑	
8. For commercial centers, is the required parking ratio 2 to 4.5 spaces per 1,000 sq. ft. of gross floor area or less?	◑	
9. Are proposed developments and redevelopment areas allowed to take advantage of opportunities for shared parking?	◑	
10. Are proposed developments and redevelopment allowed to have parking stalls under the second floor podium?	○	
Buildings		
1. Do requirements for rooftop structures and materials allow or encourage cisterns?	◑	
2. Are buildings allowed to have bioretention areas, swales, and other Green Infrastructure practices near the foundation if properly designed?	◑	
Driveways/Sidewalks		
1. Are driveway standards 9 feet or less in width?	◑	
2. Are shared driveways allowed?	●	
3. If sidewalks are required, are they required to be designed to the narrowest allowable width (e.g., 4 ft.)?	○	
4. Are sidewalks allowed to be on one side of the street only?	○	

GOAL #1 KEY QUESTIONS	IMPORTANCE[10]	COMMENTS[11]
Clustering Development		
1. Is redevelopment encouraged in lieu of greenfield development through site performance standards?	●	
2. Is Conservation or Open Space Design an option, particularly for development in environmentally sensitive areas?	●	
3. To encourage clustering and open space design, are setbacks minimized (e.g., for residential lots that are ½-acre or less in size, is the front set back 20 feet or less, the rear setback 25 feet or less, and the side setback 8 feet or less?)	●	
4. Are site designs required to have development focused on areas of lesser slopes and farther from watercourses?	◑	
5. Are policies effective in encouraging new higher density development and redevelopment to be centered around transportation corridors?	●	

GOAL #2: PRESERVE AND ENHANCE THE HYDROLOGIC FUNCTION OF UNPAVED AREAS

Objectives: Minimize building footprint/envelope area and preserve topsoil structure, sensitive wetlands and washes, sensitive soils, and sensitive stream buffers.

GOAL #2 KEY QUESTIONS	IMPORTANCE[12]	COMMENTS[13]
Topsoil Structure & Building Footprint		
1. Is disturbance of vegetated areas required to be phased?	●	
2. Is disturbance of vegetated areas and riparian areas required to be minimized?	◑	
3. Are building envelopes required/encouraged to avoid sensitive environmental areas such as riparian areas, wetlands, high infiltration soils, and steep slopes?	◑	
Wetlands		
1. Are site designs required to minimize hydrologic alteration to existing wetlands?	◑	
Sensitive Soils		
1. Are building footprints required/encouraged to avoid highly erodible soils?	◑	
2. Are building footprints required/encouraged to avoid soils with high permeability (e.g., Hydrologic Soil Group A and B)?	◑	
Stream Buffers		
3. Is a 50- to 75-foot stream buffer required/encouraged for new development and redevelopment?	○	
4. Are stream buffers for new development and redevelopment required to remain in a natural state?	◑	
5. Are site designs required to preserve existing runoff pathways to adequately support existing wetlands?	◑	
6. Is a 50-foot wetland buffer required/encouraged?	○	

[12] Degree of Importance Key to Symbols: ● Essential ◑ Very important ○ Important

[13] Indicate ordinance findings "yes" or "no." When "no," note specific location of barrier in code.

GOAL #3: HAVEST RAINWATER TO ENHANCE POTABLE & NONPOTABLE WATER SUPPLY

Objectives: Through plumbing code provisions, enhance rainwater harvesting and water conservation. Through the building and zoning code, allow the use of rooftop runoff disconnection and rainwater harvesting by routing rainwater to natural and landscape areas throughout the site.

GOAL #3 KEY QUESTIONS	IMPORTANCE[14]	COMMENTS[15]
Plumbing Code		
1. Are interior or exterior cisterns allowed?	●	
2. Is a BMP maintenance plan required?	●	
3. Is harvested rainwater allowed to be used for nonpotable interior uses such as toilet flushing?	○	
4. Are personal treatment systems allowed to be used for potable water supply?	○	
Building and Zoning Code		
1. Can rooftop runoff be disconnected and distributed throughout the site via contours and drainageways to discharge into natural areas or landscape areas?	●	
2. Are interior or exterior cisterns allowed?	●	
3. Can rain barrels be placed within standard zoning setback areas for new development and redevelopment?	●	
4. Do zoning and building provisions allow cisterns to be placed on rooftops to harvest rainwater?	◑	
5. Is a BMP maintenance plan required?	◑	

[14] Degree of Importance Key to Symbols: ● Essential ◑ Very important ○ Important

[15] Indicate ordinance findings "yes" or "no." When "no," note specific location of barrier in code.

GOAL #4: ALLOW AND ENCOURAGE MULTI-USE STORMWATER CONTROLS

Objectives: Allow and encourage stormwater controls as multiple use in open space areas and landscaped areas.

GOAL #4 KEY QUESTIONS	IMPORTANCE[16]	COMMENTS[17]
Landscaped Areas		
1. Does the code and zoning ordinance allow or promote development of an urban tree canopy?	●	
2. Are bioretention areas allowed to be constructed in the development's designated landscape areas, if properly designed?	●	
3. Are bioretention areas given "credit" as landscape area to count as a percent of the required landscaping?	●	
4. Are landscaping plans required to consider less water-intensive, native vegetation?	●	
5. Do landscaping requirements allow plantings conducive to bioretention, bioswales, rain gardens, and other Green Infrastructure BMPs?	●	
6. Do tree planting requirements allow use of rain gardens, tree boxes, and other Green Infrastructure BMPs?	●	
7. If irrigation is required, are weather-based or moisture-based irrigation controls required?	◑	
Open Space Areas		
1. Are there open space preservation requirements or incentives for new development and redevelopment?	○	
2. Is preserved open space required to be managed in a natural condition?	◑	
3. Are Green Infrastructure structural techniques such as constructed wetlands, swales, and bioretention areas allowed to be constructed in a development's designated open space, if properly designed?	●	
4. Are Green Infrastructure structural techniques such as constructed wetlands, swales, and bioretention areas given "credit" as open space to count as a percent of the required open space area, if properly designed?	●	
5. Does protection of sensitive, natural areas and habitat qualify as credit for local open space dedication?	●	

[16] Degree of Importance Key to Symbols: ● Essential ◑ Very important ○ Important

[17] Indicate ordinance findings "yes" or "no." When "no," note specific location of barrier in code.

GOAL #5: MANAGE STORMWATER TO SUSTAIN STREAM FUNCTIONS

Objectives: Replicate the predevelopment hydrology of the site, to the extent practicable, maintain water quality functions of the watershed, minimize channel erosion and flooding impacts, inspect BMPs to ensure proper construction and design, and ensure long-term maintenance.

GOAL #5 KEY QUESTIONS	IMPORTANCE[18]	COMMENTS[19]
Performance Standards		
1. Is stormwater required to be retained/infiltrated onsite (through bioretention, natural areas, and swale infiltration) where possible (e.g. Hydrologic Soil Group A and B)?	●	
2. Do stormwater management practice standards and sizing provide sufficient storage volume?	●	
3. Are water quality treatment performance standards adequate?	●	
4. Are channel protection performance standards adequate?	●	
5. Are flood control performance standards adequate?	●	
6. Are thresholds of applicability adequate (e.g. land disturbance greater than 5,000 sq. ft.)?	●	
7. Are outfalls required to be stabilized to reduce erosion?	●	
Inspections		
1. Are inspections required during construction and routinely after construction (i.e. for post construction BMPs)?	●	
2. Are inspectors required to be trained and certified?	●	
Maintenance		
1. Are maintenance agreements required?	●	
2. Is maintenance required to be performed by a certified professional?	●	

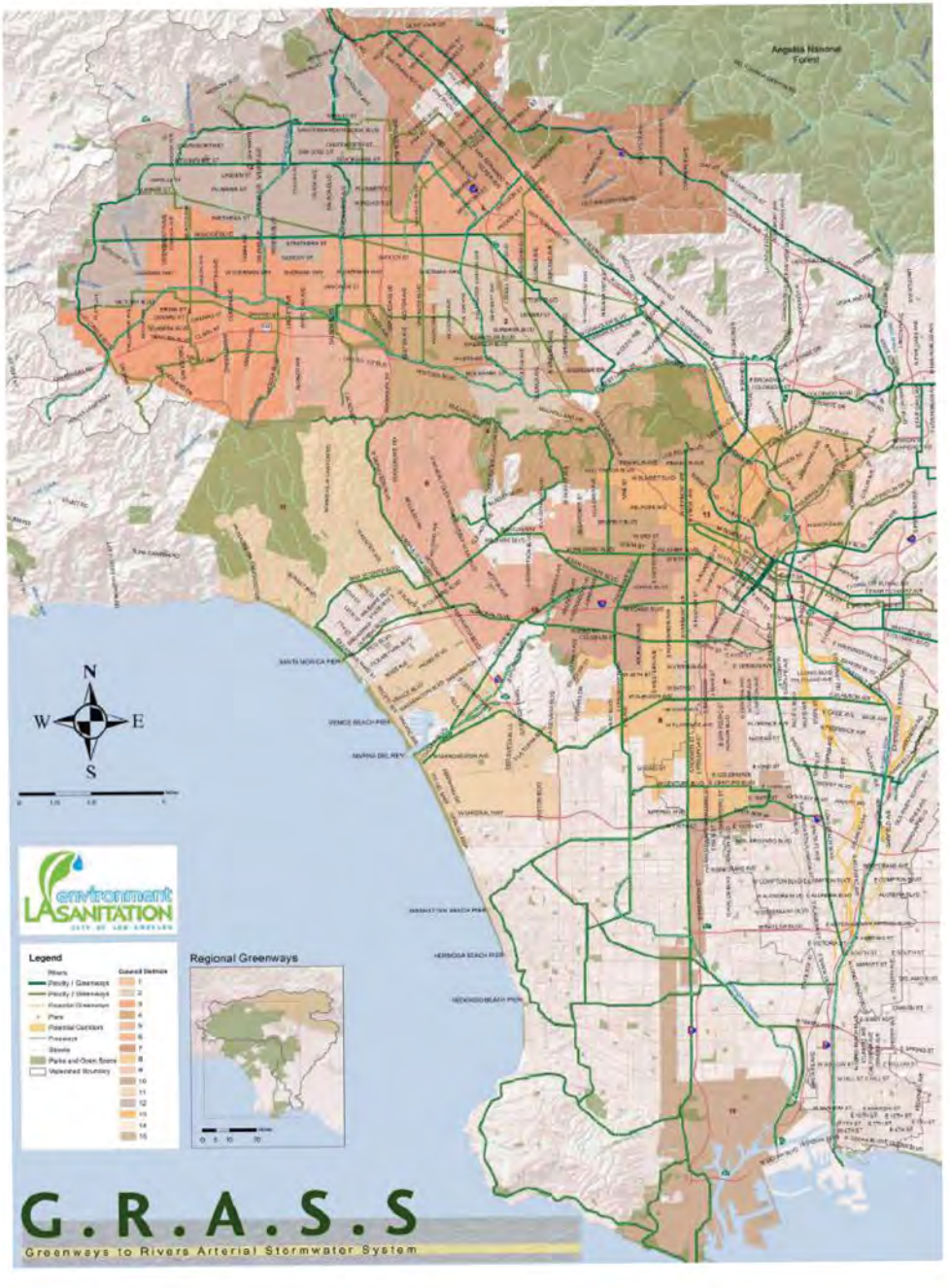
[18] Degree of Importance Key to Symbols: ● Essential ◑ Very important ○ Important

[19] Indicate ordinance findings "yes" or "no." When "no," note specific location of barrier in code.

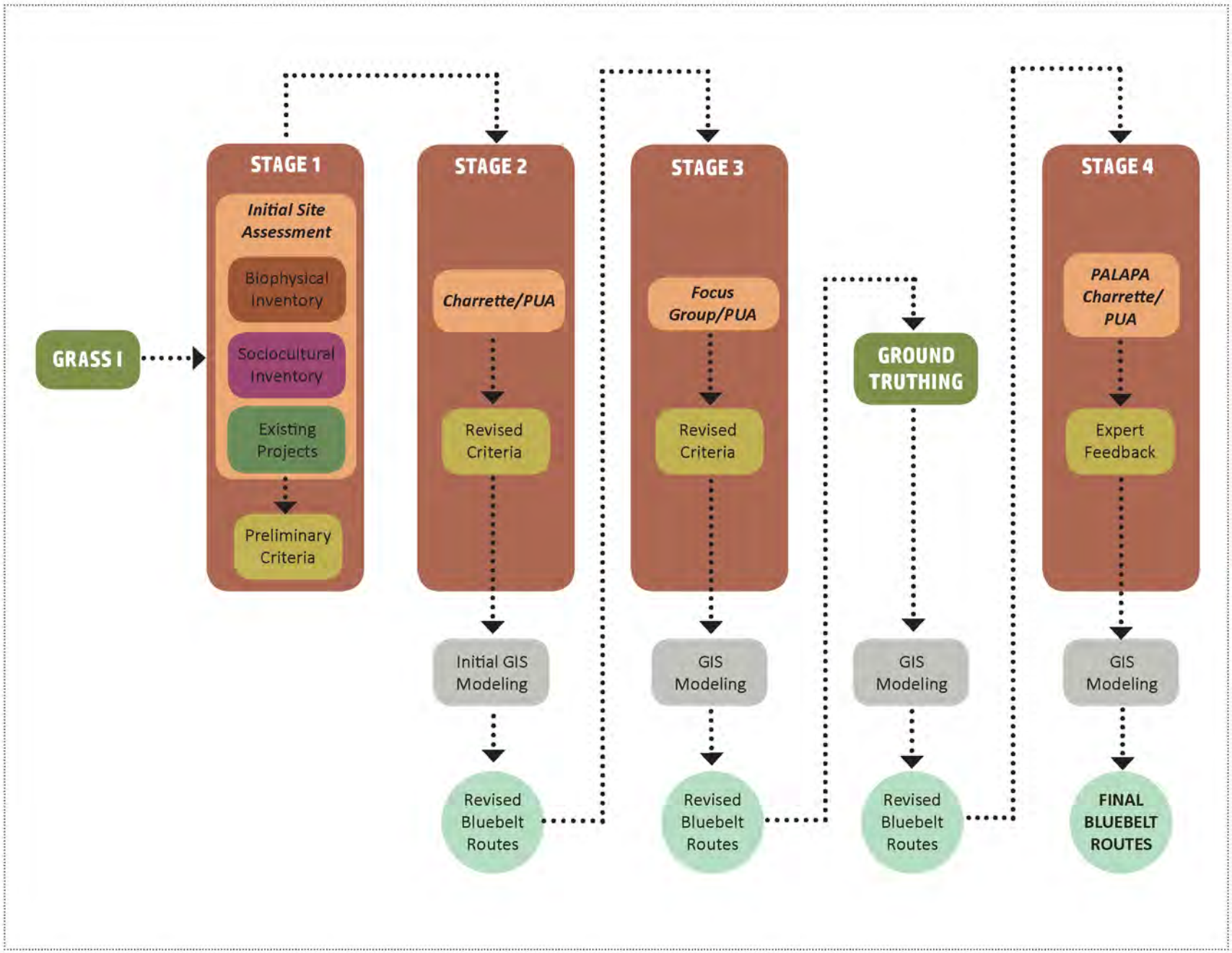
GOAL #5 KEY QUESTIONS	IMPORTANCE[18]	COMMENTS[19]
Off-Site Mitigation		
3. Is offsite mitigation required when on-site management does not meet the performance criteria (unless there is proof of no adverse impact)?	●	
4. Is offsite mitigation for forested area conservation allowed in the same named watershed? Is the replacement ratio at least 1:1?	●	
5. Is offsite mitigation for riparian area conservation allowed in the same named watershed? Is the replacement ratio at least 1:1?	●	
6. Is offsite mitigation for BMP retrofit allowed in the same named watershed?	●	
7. Is nutrient banking or the equivalent land banking allowed in the same named watershed? Is redevelopment encouraged in lieu of greenfield development?	◑	

APPENDIX M

GREENWAYS TO RIVERS ARTERIAL STORMWATER SYSTEM (GRASS) GIS ANALYSIS



GREENWAYS TO RIVERS ARTERIAL STORMWATER SYSTEM (GRASS) PROCESS DIAGRAM, PHASE II



APPENDIX N
ADDITIONAL PRECEDENTS

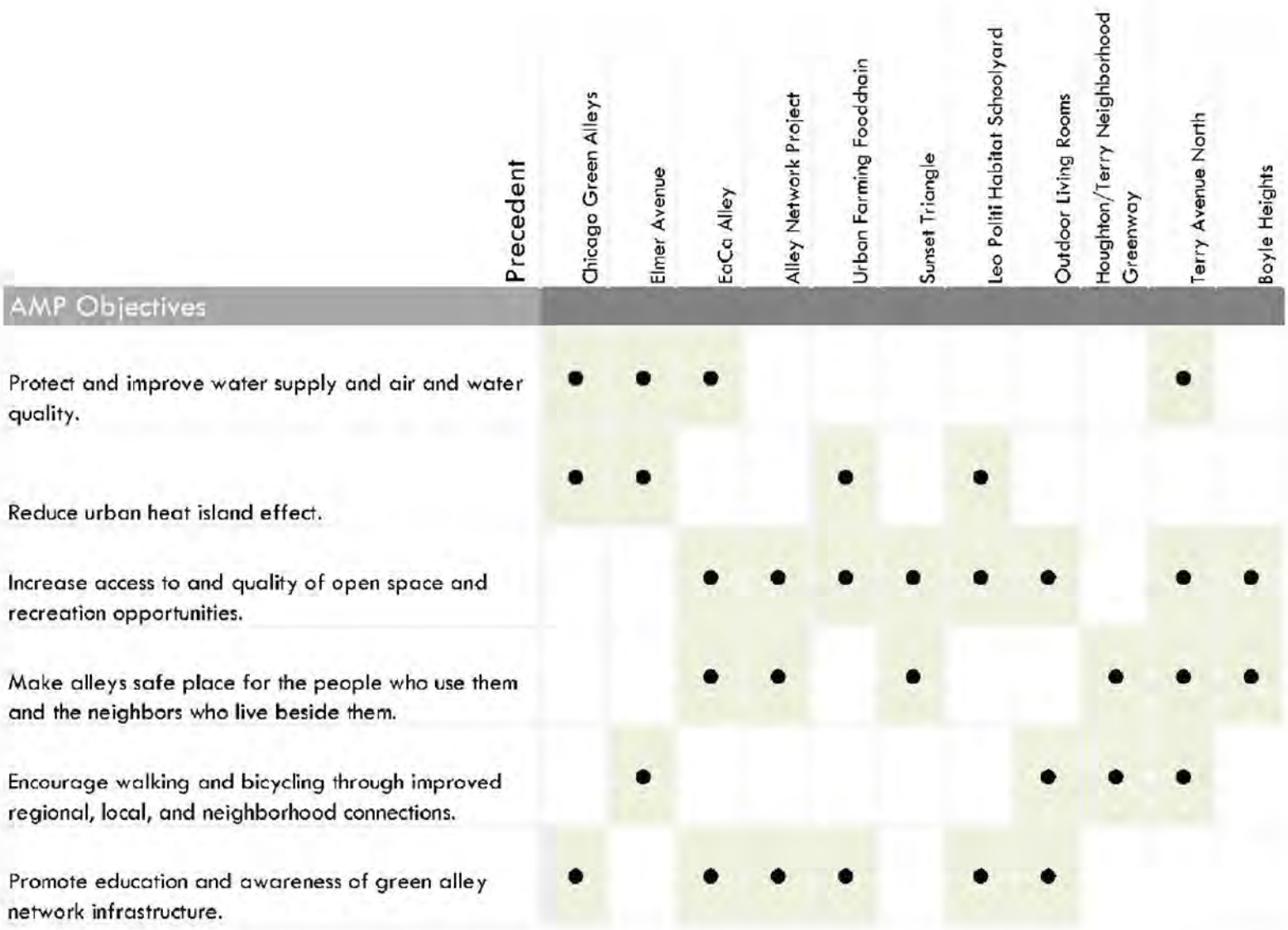


FIGURE N.1
TABLE OF RELATIONSHIPS
PRECEDENT STUDIES TO AMP OBJECTIVES



FIGURE N.2
CHICAGO ALLEY IMPRINT
J. Mogerman 2011



FIGURE N.3
CHICAGO GREEN ALLEY
LLGA.org 2012

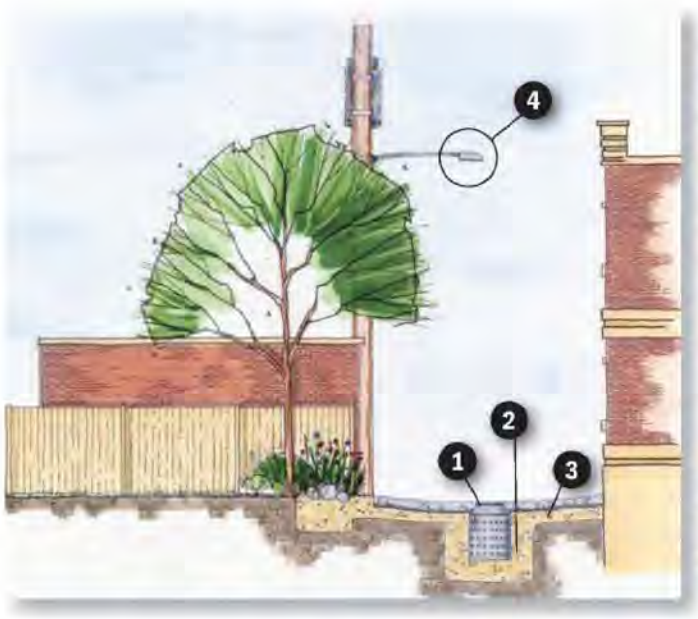


FIGURE N.4
SAMPLE GRAPHIC FROM CHICAGO GREEN ALLEY HANDBOOK

Relevant AMP Sub-Objectives

- Maximize opportunities for runoff capture and groundwater recharge in alley infrastructure.
- Convey information regarding green alley functions.
- Reduce the urban heat island effect.

Location

Chicago, IL

Description

The primary goal of the Chicago Green Alleys Network is to prevent polluted stormwater from reaching Lake Michigan. As Chicago's alleys constitute about 3,500 acres of impermeable surface within the City, the ambitious alley makeover started with repaving alleys in four pilot projects in 2006. An educational component was developed through the Chicago Green Alley Handbook to promote and educate residents and public officials to the benefits of the Green Alley Program, as well as to encourage property owners adjacent to green alleys to incorporate sustainable techniques on their property. Extending best management practices to the adjacent properties increases the performance and environmental benefits of the green alleys. The handbook presents sustainable solutions for private properties through various approaches, along with their general costs and a key denoting the appropriateness of the application for residential, commercial, and industrial properties.

Insights

The Chicago Green Alleys Network provides evidence for the effectiveness of a number of best management practices in alleys. Chicago green alleys include permeable asphalt, concrete, or pavers; high albedo paving surfaces; recycled materials in the paving; vegetated swales where appropriate; and energy-efficient lighting that reduces light pollution. The Chicago Green Alley Handbook is an example of how to clearly communicate the features, options, and benefits of green alleys to the public.

Designer/Lead Agent

Lead Agent: Chicago Department of Transportation (CDOT)

Handbook Design:

Hitchcock Design Group

Consultants:

Knight E/A, Hey and Associates, and S.T.A.T.E. Testing LLC

Cost

$900,000 for five pilot projects

Funding Source

City of Chicago (line item in the budget)

Timeline

Construction of the pilot projects started in 2006; by 2007 and since then every alley construction project has included at least one green alley strategy.

Maintenance

CDOT oversees maintenance, using a streetsweeper two times per year.

Sources

Hawkins-Cox 2008, City of Chicago Department of Transportation n.d.

ELMER AVENUE NEIGHBORHOOD RETROFIT

Relevant AMP Sub-Objectives

- Maximize opportunities for runoff capture and groundwater recharge in alley infrastructure.
- Incorporate and promote watershed education in alley design solutions.
- Increase pedestrian and bicyclist comfort.

Location

Sun Valley, Los Angeles, CA
(7700 Block of Elmer Avenue)

Description

The Elmer Avenue Neighborhood Retrofit utilizes stormwater best management practices (BMPs) to capture and filter runoff. This street, which previously did not have any stormwater infrastructure, has vegetated bioswales and a central subsurface infiltration gallery that runs the length of the street and results in 16 acre-feet of water recharging groundwater supplies annually. The project also provides opportunities for residents to install rain barrels, trench drains, and permeable pavers on their private property. The project cost $1.8 million, compared with a minimum estimate of $1.2 million for the installation of a traditional stormdrain system that would have routed all the stormwater directly to the Los Angeles River. While the retrofit cost more than the minimum estimate for the traditional system, it provides the added benefits of improving water quality and groundwater supply and aesthetic character. In addition to the stormwater performance benefits, five solar-powered LED streetlights were installed and provide annual energy savings of 1,730 kW of power.

Insights

Thirteen of the street's 24 homeowners chose to replace their traditional front yards with water-efficient California-friendly landscapes, and had rain barrels and high-efficiency drip irrigation systems installed. A street stormwater retrofit project provided an excellent opportunity to extend the project and its benefits to the neighboring private properties. The AMP recommends involving landowners and incorporating private property in design solutions whenever it is suitable. An analysis of the Elmer Avenue project in the Landscape Architecture Foundation's (LAF) case studies suggests "for projects where participation is solicited to install features on private property, project organizers should have a plan for those that don't buy in on the project initially but come around after they see the results" (Landscape Architecture Foundation 2012, n.p.).

Other benefits of the project, as determined by the LAF, include: the reduction of lead (60%), copper (33%), and total suspended solids (18%); a 30% reduction of potable water use (and an annual savings of $360) for homeowners with enhanced front yards; 7.25 tons of carbon sequestered per year by soil and plants (a six-fold improvement); an increase of resident satisfaction with their block's walkability from less than 2% of survey respondents before the project to 92% after completion; and public education on water issues and stormwater management BMPs (LAF 2012, n.p.).

Size

Four acres (one block of street and adjacent residential lots)

40 acre stormwater catchment area

Designer

Stivers & Associates, Inc.

Cost

~$2.7 million total

~$1.8 million total construction

$200,000 landscape construction on private property

$200,000 landscape construction in public right-of-way

Timeline

First phase of construction started in 2008, project completed in 2010.

Maintenance

During plant establishment, The Council For Watershed Health had a maintenance contract for $1,262 per month. Maintenance was performed 2 to 3 times per month and included irrigation adjustment, replacement of mulch and dead plants, trimming of plants, removal of litter and weeds, and raking of swales.

Continued maintenance in overseen by residents who help monitor landscapes. Quarterly maintenance and training days are held to cover the items in the maintenance manual. The manual has been provided to each household and details a calendar of activities.

Sources

Landscape Architecture Foundation 2012, Owens Viani 2011, Robinson and Hopton 2011, Green 2010, Council for Watershed Health 2008a and 2008b.



FIGURE N.5
ELMER AVENUE WATER-EFFICIENT RESIDENTIAL LANDSCAPE



FIGURE N.6
CAFE SEATING IN EACA ALLEY
A. Walker 2012



FIGURE N.7
EACA ALLEY ENTRANCE
A. Walker 2012

EACA ALLEY

Relevant AMP Sub-Objectives

- Increase accessibility of open space, including alleys.
- Identify opportunities for public open space.
- Maximize opportunities for runoff capture and groundwater recharge in alley infrastructure.
- Reduce illegal dumping and vandalism within and near alleys.
- Increase visibility of green alleys.
- Design spaces appropriate for local users, to meet local needs.
- Create opportunities for community participation and stewardship.

Location

Hollywood, Los Angeles, CA
(between Cahuenga and Cosmo Street, north of Selma Avenue)

Description

East Cahuenga, or EaCa, Alley was previously gated, strewn with litter and marred by graffiti. It was used primarily for garbage collection—with several large dumpsters in the alley—but also by drug users associated with a needle exchange housed in an adjacent building. A restaurant cleaned up a portion of the alley and started using the space for outdoor seating. The Hollywood Property Owners Alliance then approached other alley-adjacent property owners about making the alley public and reclaiming it for more positive uses. The revitalization effort became a collaboration between the alliance, the Community Redevelopment Agency, the office of Los Angeles City Council President Eric Garcetti, and alley-adjacent business owners. The redesign included permeable brick pavers and other stormwater improvements, as well as an entrance gate with a sign that was paid for by one of the property owners. Future additions may include art installations and energy-efficient lighting. Adjacent businesses can utilize up to ten feet of the alley behind their space, however in order to do so the City mandates they must serve food.

Insights

EaCa Alley was redeveloped largely with the initiative and resources of adjacent property owners in addition to government resources. While South Los Angeles residential neighborhoods are an entirely different setting compared to this Hollywood commercial district, EaCa Alley still provides a broad example of the importance of community involvement and contribution.

Designer/Lead Agent

Lead Partner: Hollywood Property Owners Alliance
Partners: Community Redevelopment Agency, Office of LA City Council President Eric Garcetti, and business owners
Design: City of Los Angeles Bureau of Engineers

Cost

$800,000

Funding Source

Community Redevelopment Agency (infrastructure and construction documents), business owners

Timeline

2007-2012

Maintenance

The Hollywood Business Improvement District (BID) provides funding for operation and maintenance of the alley. Hollywood BID business owners approved an annual assessment of $11 per linear foot of the alley. Revenue from this assessment helps pay for ongoing operation and maintenance costs.

Sources

Gelt 2012, Walker 2012a, Hollywood Entertainment District 2010.

ALLEY NETWORK PROJECT

Relevant AMP Sub-Objectives

- Increase accessibility of open space, including alleys.
- Add recreation space in neighborhoods with the most need for it.
- Increase visibility of green alleys.
- Design spaces appropriate for local users, to meet local needs.
- Create opportunities for community participation and stewardship.

Location

Seattle, WA
(Nord Alley is located in Pioneer Square)

Description

Seattle's Alley Network Project is an example of a collaborative effort between community groups, businesses, neighbors, researchers, and designers to "boost healthy activity" in Pioneer Square's alleys. In one of these alleys—Nord Alley—waste collection was changed to remove dumpsters and have daily pick-up instead. Alley neighbors took down boards covering their windows, and local businesses bought potted plants and used yard furniture. To further activate the space, Seattle's Alley Art Project installed a sculpture in the alley and a local organization began hosting monthly parties.

Insights

Much like the AMP is a collaboration between City agencies, non-profit organizations, and high school and graduate students, the Seattle Alley Network Project draws upon a wide-variety of talents, including public space experts, community organizers, marketing professionals, and research students, to bring about long-term solutions. The Seattle project has also held a competition among architects and landscape architects to generate ideas for greening alleys. By hosting block parties and other community events (such as watching sporting events or movies), Nord Alley provides an example of how to increase community involvement and social activity within the alley. At the same time Nord Alley also provides space to grow plants, perform water filtration, and provide routes for people on foot and bikes.

Designer/Lead Agent

Lead Partner: International Sustainability Institute
Partners: The Alliance for Pioneer Square, Green Futures Research & Design Lab, Pratt Fine Arts Center, Feet First, Seattle Parks Foundation

Funding Source

City of Seattle, private foundations, and local businesses.

Maintenance

Information not provided.

Sources

Nelson 2011, Toole 2011, Alley Network Project 2010.



FIGURE N.8
BLOCK PARTY HELD IN SEATTLE'S NORD ALLEY
myurbanist.com 2010



FIGURE N.9
GRAND OPENING OF SUNSET TRIANGLE



FIGURE N.10
TEMPORARY INFRASTRUCTURE AT THE SUNSET TRIANGLE PLAZA IN LOS ANGELES

SUNSET TRIANGLE PLAZA

Relevant AMP Sub-Objectives

- Add recreational space to the neighborhoods with the most need for it.
- Reduce vehicular use and promote pedestrian and alternative transportation.
- Reduce urban heat island effect.
- Ensure availability of proper public amenities for pedestrians and bicyclists.

Location

Los Angeles, CA
(Griffith Park Boulevard and Edgecliffe Drive)

Description

Sunset Triangle Plaza is the result of a permitted temporary (one year) street closure to create space for a pedestrian plaza. Potted plants, pavement paint, and movable tables and chairs have converted the street into a multi-purpose plaza that can support unprogrammed activities as well as formalized events, such as a farmers market.

Insights

Sunset Triangle Plaza provides a precedent for utilizing temporary use permits through the City of Los Angeles to temporarily close a street for alternative public use. With minimal changes to the infrastructure an automobile-oriented space can be completely converted to a space that supports pedestrians and outdoor recreation. A particular consideration highlighted by this project is the Department of Transportation restricts the use of some paint colors, such as red or yellow, for decorative paving; the designer selected bright green as an alternative hue that is eye-catching and warns drivers that the street's use has been altered.

Size

11,000 square feet

Designer/Lead Agent

Project Leads: City of Los Angeles and Streets for People
Designer: Rios Clementi Hale Studios

Cost

$25,000 (design services were donated)

Funding Source

Implementation was funded through a grant.

Timeline

Opened March 2012

Maintenance

Maintenance is handled by the Silver Lake Improvement Association.

Sources

Meinhold 2012, Walker 2012b.

OUTDOOR LIVING ROOMS, COMMUNITY LIVING ROOMS

Relevant AMP Sub-Objectives

- Identify opportunities for public open space.
- Add recreation space in neighborhoods with the most need for it.
- Ensure availability of proper public amenities for pedestrians and bicyclists.
- Design spaces appropriate for local users, to meet local needs.
- Create opportunities for community participation and stewardship.

Location

Los Angeles, CA
(southwest corner of Vermont & Manchester; E. Edgeware Road at Betty Placencia School)

San Francisco Bay Area, CA

Description

Steve Rasmussen Cancian, a landscape architect and University of California-Berkeley lecturer, developed the idea of increasing the liveliness of the street by creating spaces for socializing. These spaces would be outdoor or community living rooms, created by placing "unembellished, inexpensive outdoor furniture" (Jesi 2010) on inner-city sidewalks. He utilized a participatory process from the beginning, allowing the community to survey the area, pick the location, and help design the living room. The aim was to explore the options for physical improvements in low-income neighborhoods that do not spur the gentrification process.

Insights

Outdoor living rooms provide an example to the AMP of how the community can come together to provide public space amenities at a relatively low cost. These projects capitalize on affordable materials and existing but underutilized public spaces – sidewalks – to provide a space where people can stop and rest or meet up and socialize, and they do so in a manner that celebrates and encourages the character of the neighborhood. By increasing the liveliness of the street culture, Rasmussen Cancian aimed to discourage gentrifying developers who might want to change the neighborhood into something else, but the act may also have the effect of making the area cleaner and safer. Outdoor living rooms could be implemented in alleys or on sidewalks within the green alley networks in order to increase the use and amenities of public spaces. The AMP recommends involving local community members to select specific sites and amenities for outdoor living rooms.

Size

Variable, as space allows.

Designer/Lead Agent

Landscape Architect: Steve Rasmussen Cancian

Los Angeles Partner: Verde Coalition

Cost

$5,000-$15,000

Sources

Jesi 2010, Gropman 2008, Steinhauer 2008, Alliance for Community Trees 2007.



FIGURE N.11
OUTDOOR LIVING ROOM IN LOS ANGELES
S. Taylor 2010



FIGURE N.12
BEFORE



FIGURE N.13
AFTER
S. Rasmussen Cancian/
designerbuildermagazine.org

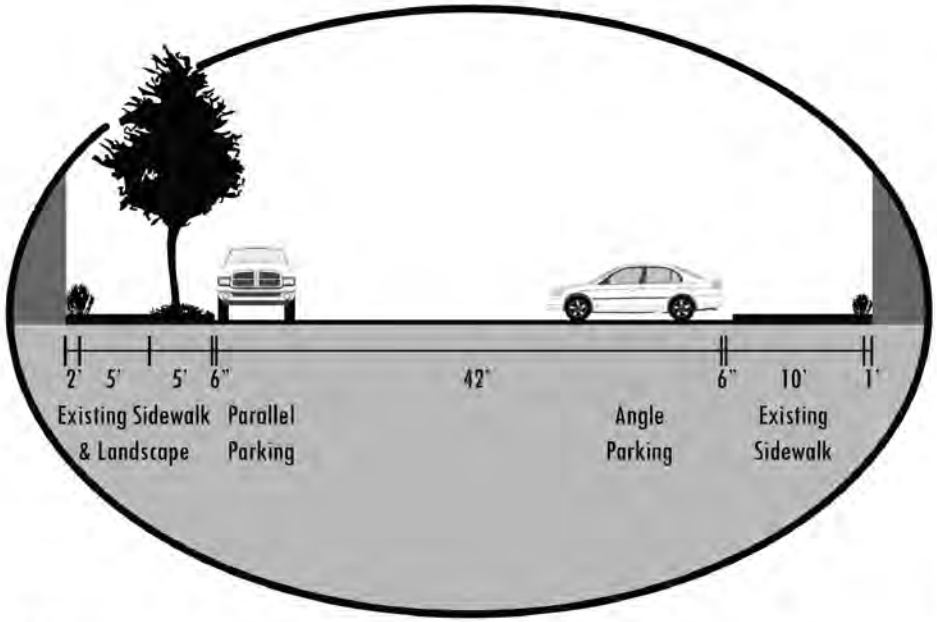


FIGURE N.14
TERRY AVENUE NORTH BEFORE
Adapted from Seattle Department of Transportation 2010

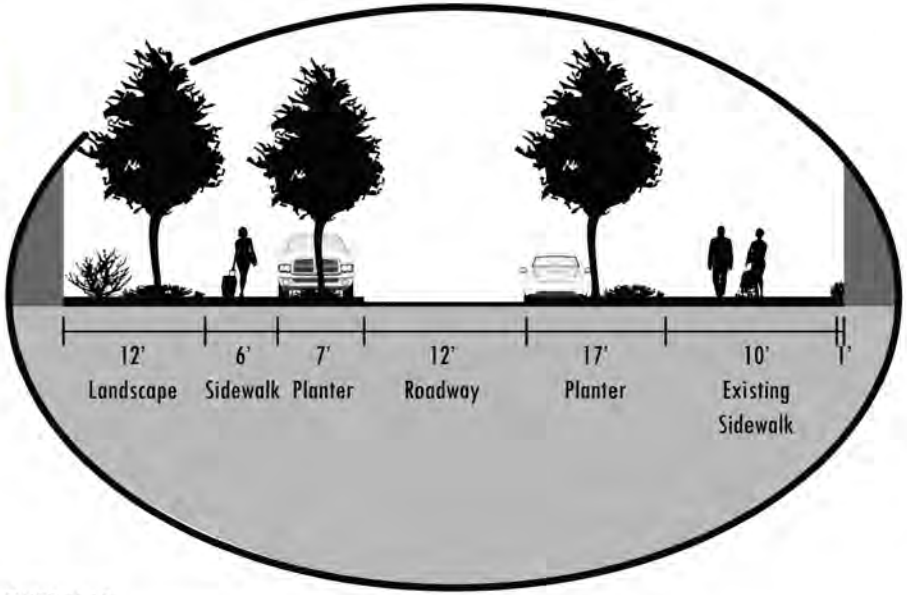


FIGURE N.15
TERRY AVENUE NORTH AFTER
Adapted from Seattle Department of Transportation 2010

TERRY AVENUE NORTH

Relevant AMP Sub-Objectives

- Expand and improve pedestrian and bicyclist connections among existing and planned open spaces.
- Reduce conflicts between drivers, bicyclists, and pedestrians within and near alleys.
- Reduce vehicular use and promote pedestrian and alternative transportation.
- Increase pedestrian and bicyclist comfort.
- Maximize opportunities for runoff capture and groundwater recharge in alley infrastructure.

Location

Seattle, WA
(Between Denny Way and Valley Street)

Description

Terry Avenue North is a street centrally located in an industrial area of Seattle, which has been transitioning into a center for biotech jobs. Planning documents encourage maintaining Terry Avenue's industrial and maritime character, while also allowing it to serve as a social hub for the surrounding community. The resulting design guidelines for the street are based on the concept of the Dutch woonerf.

Woonerven (plural of woonerf) were developed in the Netherlands to reduce traffic speeds and road accidents in residential areas. They are streets designed to give cars, pedestrians, and cyclists equal use of the road. Woonerven use planting, play areas, chicanes, and building locations to break sightlines, force changes of direction, and bring average speeds down to about 12 miles per hour. They are curbless and lack the directional signage that we are accustomed to seeing along United States roadways. This results in all users proceeding with caution, and paying attention to conditions.

While the woonerf was the inspiration behind Terry Avenue North, the regulation and legal environment of the United States restricts the inclusion of some of the Dutch design elements. In particular, accessibility regulations require differentiation between vehicle-use areas and vehicle-free areas. Instead of using a curbless design, Terry Avenue North design guidelines call for continuity of paving materials across the street and adjacent pedestrian areas with a two inch curb and tactile warning strip as separation. Like woonerven, Terry Avenue North will not have traffic signals.

Insights

Terry Avenue North illuminates some of the difficulties in implementing European design concepts in the United States, but it also sets the precedent that comparable guidelines can be approved. While most alleys in South Los Angeles do not provide enough space to actually force changes in direction of vehicles, visual cues and the use of materials may be utilized to create the woonerf's effect of slowing traffic and making the space safer and more accommodating for a diverse set of users.

Designer/Lead Agent:
Seattle Department of Transportation and Seattle Department of Planning and Development

Consultants: Weinstein Architects + Urban Designers, Gustafson Guthrie Nichol, SvR Designs, EnviroIssues

Timeline
Design guidelines completed March 2005

Sources
Baker 2006, City of Seattle 2005, Seattle Department of Transportation 2005, and Williams 2012.



FIGURE N.16
WOONERF IN HOLLAND
J. Mann 2007



FIGURE N.17
TERRY AVENUE NORTH IN SEATTLE
Seattle Department of Transportation 2012



FIGURE N.18
PAINTED PAVING IN ALLEY
K. Fortin 2013



FIGURE N.19
PLANTER BOXES IN ALLEY
K. Fortin 2013

BOYLE HEIGHTS ALLEY PROJECTS

Relevant AMP Sub-Objectives

- Increase accessibility of open space, including alleys.
- Identify opportunities for public open space.
- Reduce illegal dumping and vandalism within and near alleys.
- Increase visibility of green alleys.
- Design spaces appropriate for local users, to meet local needs.
- Create opportunities for community participation and stewardship.

Location

Boyle Heights, Los Angeles, CA (multiple locations)

Description

Boyle Heights is a dense neighborhood in east of Downtown Los Angeles with few park and public spaces. To address the need for public space in the neighborhood, Union de Vecinos, a local advocacy group with their neighborhood committee Bienestar, called upon the community to envision a new reality for some of the many alleyways in the area.

Community meetings were held where participants determined a beach theme for one of the alleys. To represent this, the paving was painted blue with a tan edge. Residents also included solar lighting in the plan as well as planters on wheels which can be moved around to temporarily close the alleys to cars creating a small plaza space. Murals would make up part of the renovation as well.

The community also wanted to see the alley used as a space for gatherings like movie nights, potlucks, and events. Residents raised funds with the assistance of Union de Vecinos. Later the residents built and installed design features.

To date, Union de Vecinos has finished 7 alley and public space transformations. These transformations have engaged 250 volunteers in the process and it is estimated that the projects benefit over 3,000 residents in the neighborhood.

Insights

While many green infrastructure design best practices require a certain level of invested capital and expertise to implement, positive changes, which do not necessarily require large amounts of money, but do need the involvement of the local community, can be enacted in a short timeline and with limited monetary resources. There are a number of preliminary measures residents can undertake immediately with little more than a few supplies and dedication of time and energy can be of benefit to the local community.

Designer/Lead Agent

Union de Vecinos, Bienstar Neighborhood Committee, Community members

Cost

Under $3,2000

Timeline

Project was designed and installed in 6 months time.

Maintenance

Maintenance provided by residents living adjacent to the alley.

Sources

Fortin 2013, Community Health Councils, Inc. 2015.



FIGURE N.20
PLANTER BOXES IN ALLEY
K. Fortin 2013



FIGURE N.21
MURALS LINE THE ALLEY
K. Fortin 2013

Small things count in intimate alley spaces.

Clay, 1978

APPENDIX 0

LITERATURE REVIEWS

URBAN FORESTS ANALYSIS: ASSESSMENT OF THE ECOLOGICAL, ECONOMIC, AND SOCIAL BENEFITS & COSTS

Linda Huynh

Introduction

At first glance, urban forests may simply be seen as a collection of trees subsisting within an urban environment. Broadly speaking, the term urban forest refers to "all publicly and privately owned trees within an urban area—including individual trees along streets and in backyards, as well as stands of remnant forest" (Nowak, Stein, Randler, Greenfield, Comas, Carr & Alig 2010, p. 3). However, as human populations continue to grow and have an ever-increasing impact on local, regional, and global environments (Nowak et al. 2001), the reputation of urban forests have evolved from individual trees and remnant forest to also include the symbolic and physical representations of the line that, once clearly dividing human and natural systems, now blurs with continued urbanization.

Urban forests are particularly well-positioned to reveal this "line" for the reason that one of the most significant changes in land use and land cover resulting from population growth and urbanization have been the harmful effects to the viability of forests that the fragmentation, or the breaking up, of large acreages into smaller pieces have had (Vince, Duryea, Macie & Hermansen 2004). In other words, the continued urbanization of cities is creating significant changes in land use and land cover, affecting the structure, pattern, and function of ecosystems (McPherson, Simpson, Xiao & Wu 2011) in such a way that urban forests are now found within the blur that is the forest interface, existing with human systems in urbanized areas as:

> Ecosystems characterized by the presence of trees and other vegetation in association with people and their developments. Although people influence forests across the landscape, urban forests are located where human influences are concentrated (cities, towns, and villages) (Nowak et al. 2001, p. 38).

Where there once existed forests isolated from human influences, there now exists urban forests embedded in human influences and their urbanization. Therefore, taking into consideration human influences and urbanization, urban forests have then come to symbolically represent the given care and consideration of the earth's natural systems and physically represent the delicate balance between humans, development, and natural resources.

Background and Purpose

In light of climate change and sustainable development, the physical representation of urban forests is currently the focus of many environmental efforts as urban forests are becoming more widely accepted and referred to as "green infrastructure," recognized for their abilities to provide critical, multiple, and sometimes conflicting functions within urbanized systems of streets, buildings, and channelized rivers (Nowak et al. 2010, Oleyar et al. 2008). In further study of urban forests as green infrastructure the following functions and benefits were recognized: reducing urban heat islands (McPherson et al. 2011), conserving energy (McPherson et al. 2011), reducing urban runoff (Manning 2008), reducing water pollution (Manning 2008), improving soils quality (Nowak et al. 2010), and improving wildlife and biodiversity (Nowak et al. 2010). This paper aims to review how urban forests work to conserve natural ecosystem values and functions while also providing associated benefits to human populations).

Furthermore, with the passing of the California Global Warming Solutions Act of 2006, also known as AB 32, reducing greenhouse gas emissions in California to 1990 levels by 2020[1] is presently one of the state's most prominent initiatives in its efforts to address climate change (ARB 2011). Therefore, as humans are increasingly spending most of their time in urban areas (Streiling & Matzarakis 2003), and as the popularity of urban forests as an important strategy to achieving greenhouse gas emissions reduction rises, cities within the state are increasingly focused on urban forests in their efforts to comply with AB 32. Currently, close to 1,000 communities in the United States have signed climate protection agreements that include tree planting and urban forest maintenance as forms of combatting global warming (Nowak et al. 2010).

In the years ahead, it is expected that cities will maximize the utilization of urban forests through the [1] facilitation of campaigns to cultivate more urban trees (Lowry, Ramsey & Kjelgren 2011 quoted in Brown 2008, McPherson et al. 2008), [2] the creation of urban forest management programs (Nowak, Noble, Sisinni & Dwyer 2001), and [3] the implementation of policies protecting cities' urban forests. As the real potential for local, regional, and global impacts resulting from urban forests is an important issue for landscape architects to understand, this paper also aims to better understand urban forests' methods of measurement and programs of implementation.

> Urban Forestry is now poised to go global with the overt and ambitious intent of using trees and natural to semi-natural habitat patches for ameliorating the negative environmental effects of urbanization, and for contributing to the monumental, long-term mission of creating more livable, ecologically sustainable eco-cities (Carreiro, Song & Wu 2008, p. 5).

By "viewing human and natural systems in urban areas not as separate entities, but as interacting components of an integrated whole" (Oleyar, Greve,

1 In December 2007, based on its 1990-2004 inventory work, the Air Resources Board approved the statewide 2020 emission limit of 427 million metric tons of carbon dioxide equivalent (MMTCO2E) of greenhouse gases.

Withey & Bjorn 2008, p. 289), an interdisciplinary approach will now be taken in this paper to analyze urban forests in relationship to both human and natural systems by [1] evaluating the benefits and costs of urban forests, [2] considering the methods used for measuring and predicting impacts, and [3] providing an overview of forest management programs, including issues, strategies, campaigns, and policies, for implementation.

Benefits

According to a USDA report titled *Sustaining America's Urban Trees and Forests*, approximately 80% of the U.S. population "lives in urban areas and depends on the essential ecological, economic, and social benefits provided by urban trees and forests" (Nowak et al. 2010, p. 2). As cities require energy and materials to function, often from the outside and from considerable distances, it is believed that one aspect of urban forests is their abilities to bring greater sustainability to the succession of urban metabolism, or flow of energy and materials, by reducing energy consumption and waste products, such as air pollutants, through the appropriate placement of trees in sufficient numbers (Manning 2008). Urban forests reduce energy consumption through the shading and cooling of heat islands and reduce waste products, such as urban runoff, through the capturing and storing of rainfall by their leaves (Manning 2008).

The function of urban forests to bring greater sustainability to the flow of energy and materials is just one of the benefits of urban forests. Following, through a review of the literature, the full functions of urban forests will be shown to be wide ranging, its benefits relevant to the ecological, economic, and social well-being of citizens and communities.

Ecological Benefits

1. Rain capture

One approach to understanding the potential ecological benefits that are received from urban forests is to understand what may be lost during urbanization. For example, with urbanization comes the removal of vegetation so that previously open soil areas are paved during development (Manning 2008). In combination with other impervious surfaces, such as roofs, by replacing vegetation with pavement, the amount of water-absorbing surfaces becomes limited and, when combined with increased temperatures and particulate air pollution that lead to higher rainfall, result in short but intense rain events (Manning 2008). This is demonstrated in Los Angeles where the tree canopy cover is 21% whereas 61% if the City's land cover was impervious (McPherson et al. 2011). As a result of these intense rain events that cannot be quickly absorbed, the rainfall that arrives does not permeate into the ground where it will be treated, but instead directly runs off into storm or sewage water sewers. Furthermore, in instances where sewage treatment plants become overwhelmed by the quantity of rainfall, partially treated or raw sewage must then be released into rivers and oceans (Manning 2008).

What has been lost through pavement are permeable surfaces and although urban forests cannot remedy these impermeable surfaces, urban forests are able to benefit stormwater capture and combat impervious surfaces by acting as a surrogate to permeable soils by intercepting and storing rainfall through the water-absorbing surfaces of their leaves, branches, and crowns (McPherson et al. 2011), slowing the flow of precipitation reaching the ground (Nowak et al. 2010), creating soil conditions through its roots and leaf litter that promote the infiltration of rainwater into the soil (City of Los Angeles 2009), and releasing water into the atmosphere through evapotranspiration (City of Los Angeles 2009).

2. Bio-climate

Another approach to understanding the impacts of urban forests is to consider the ecological benefits specifically associated with a mass of trees as opposed to a single tree. Such a consideration was made in a study conducted by Streiling and Matzarkis (2003) in which the effects of single trees versus small clusters on the bio-climate of a city were examined. The study found that, in comparison to single trees, small clusters of trees provided greater positive effects on the thermal and air quality component of the urban climate (Streiling & Matzarakis 2003). Urban forests work to improve air quality by "lowering air temperatures, altering emissions from building energy use and other sources, and removing air pollutants through their leaves" (Nowak et al. 2010, p. 6).

Additionally, the greater effects of small clusters of trees also applied to both [1] reductions in stormwater runoff, with an increased volume of rainfall being intercepted by trees and stored in tree crowns (McPherson et al. 2011), and [2] reductions in heat island intensity, with clusters reducing greater amounts of "incoming radiation by shading paved areas and buildings, reducing temperatures, and ultraviolet radiations" (Manning 2008, p. 364). Urban forests also act to reduce heat island intensity and increase thermal comfort by transpiring moisture and reducing wind speeds (Nowak et al. 2010, p. 6).

3. Other Ecological Benefits

In addition to benefiting stormwater capture, improving air quality, and reducing heat island intensity, the ecological benefits of urban forests also include:

- Reducing ozone concentrations by taking up carbon dioxide during photosynthesis and directly storing carbon within their tissues, in essence removing carbon dioxide from the carbon cycle (Manning 2008, McPherson et al. 2011);
- Reducing over emissions from power plants through the mitigation of carbon emissions from combustion (Manning 2008). The reduction of power plants' emissions is associated with heat island intensity where urban forests reduce the incoming shortwave radiation from the Sun that is stored in

buildings and pavements. Urban forests achieve reductions in temperature and ultraviolet radiation by shading paved areas and buildings. This reduction in temperature reduces the energy needed for cooling buildings, which results in reductions in carbon dioxide emitted from power plants that provide energy used for cooling (Manning 2008);

- Improving wildlife and biodiversity by helping to create and enhance animal and plant habitats, acting as reservoirs for endangered species, and serving as indicators of local environmental health (Nowak et al. 2010 quoted in Howenstine 1993, VanDruff et al. 1995); and
- Improving soil quality by remediating "soils at landfills and other contaminated sites by absorbing, transforming, and containing a number of contaminants" (Nowak et al. 2010, p. 6 quoted in Westphal & Isebrands 2001).

Lastly, a study by Lohr et al. (2004) found that, of seven possible reasons to retain trees in cities, the highest ranked reason as determined by residents was the "importance in shading and cooling downtown areas" (Lohr, Pearson-Mims, Tarnai & Dillman 2004, p. 29). The fact that residents' ranked their top reason for retaining urban forests to be for the shading and cooling of downtown areas suggests that the ecological benefits received from urban forests is fundamentally understood, and that the importance of urban forests to the sustainability of the environment is widely supported.

Economic Benefits

1. Property values

The economic benefits of urban forests can most strongly be demonstrated by examining the extensive literature that pertains to the economic benefits of landscaping with trees. The economic benefits received from landscaping with trees, in yards, in parks, in greenways, along streets, and in shopping centers, have been widely researched and accepted to include increased property values and commercial benefits; with one study finding that on average, prices for goods purchased in landscaped areas were 11 percent higher than those prices in areas with no trees (Nowak et al. 2010).

Moving away from the literature pertaining to landscaping with trees to literature specifically focused on urban forests, studies have found that the economic function of urban forests can be measured as the change in housing prices attributed to location on the gradient, from highest- to lowest-density of human settlement, (Oleyar, Greve, Withey & Bjorn 2008) and that the economic benefits or urban forests and green spaces in cities have been demonstrated through increased property values and perceived consumer friendliness (McPherson et al. 2011 quoted in Payton et al. 2008, Wolf 2005). Urban forests promote consumer friendliness in that trees and landscaping create pedestrian friendly shopping areas, providing a more enjoyable experience in business and shopping districts (City of Los Angeles 2000, City of Los Angeles 2009). McPherson et al. (2011) further notes that it is the positive aesthetic impacts of urban trees that work to economically benefit cities by increasing the sales prices in properties and are captured in the differences in sales prices of properties with and without trees (McPherson et al. 2011).

The combined literature on landscaping with trees and urban forests reveal that urban forests provide economic benefits through [1] positive aesthetic impacts, which translate into increased property values, and [2] increased perceived consumer friendliness, which translate into increased commercial benefits.

Social Benefits

Manning (2008) states that urban forests help to improve one's physical and mental state by positively influencing the well-being of residents through access to green spaces (Manning 2008), and Oleyar et al. (2008) states that social benefits of urban forests are a function of "residents' use of parks and forests and satisfaction with their neighborhoods" (Oleyar et al. 2008, p. 289). Social benefits could therefore be understood as improved health through the usage of parks and forests and increased well-being through increased satisfaction of neighborhoods.

The above interpretation is supported with studies that have shown urban forests to have improved [1] the physical and mental well-being of residents, where "trees and other planted areas in urban environments are aesthetically pleasing to residents, while also providing relief from noise and stress" (Manning 2008, p. 365, McPherson et al. 2011 quoted in Payton et al. 2008, Wolf 2005) and [2] the health among children, where the presence of tree-lined streets has been associated with children walking to school (McPherson et al. 2011 quoted in Larson et al. 2009) and where playing in places with trees and vegetation has been proven to support children's development of skills and cognitive abilities (Westphal 2003 quoted in Taylor et al. 1998).

Attributes physical health benefits received from urban forests to tree shade, which reduces ultraviolet radiation and its associated health problems, and views of trees, where hospital patients with window views of trees have been shown to recover faster and with fewer complications than patients without such views (Nowak et al. 2010); and attributes mental benefits received from urban forests to the ability of urban forests to make environments more aesthetically and emotionally satisfying places to live, work, and spend leisure time (Nowak et al. 2010).

Community Benefits

The social benefits provided by urban forests to the physical and mental well-being of individuals can be translated to the community level where "trees make urban communities better places to live" (Manning 2008 quoted in McPherson 2007). For instance, urban forests have been shown to provide the community benefit of reduced crime and social strife in well-planted neighborhoods, especially among the demographic groups of

people with children, the less affluent, and the elderly (Manning 2008), by making important contributions to the economic vitality and character of a city, neighborhood, or subdivision (Nowak et al. 2010). By enabling communities to take pride in their neighborhood and feel secure in their environment, communities are encouraged to take ownership of their space and prevent crime and social strife to the best of their abilities.

Furthermore, studies focused on residents who participated in tree plantings and/or urban forestry efforts have found that the act of expanding urban forests through tree plantings worked to provide community benefits by promoting a stronger sense of community through the encouragement of neighborhood interaction and empowerment of residents to improve their surroundings (Lohr et al. 2004, Nowak et al. 2010).

Costs

The major cost to sustaining urban forests is the existing challenge of increasing water demands resulting from population growth (Lowry et al. 2011). As such, when weighing the initial water costs involved with expanding urban forests, it is critical to understand, especially in the context of designing and maintaining sustainable cities, "how a growing urban forest impacts residential irrigation water demand" (Lowry et al. 2011, p. 193). In an attempt to address this issue, a study conducted by Lowry et al. (2011) studied the influence of growing urban forests on residential landscape water demand. Lowry et al. (2011) found that, as the abundance of tree/shrub increases, the amount of turf grass cover decreases so that over time, the overall water demand decreases (Lowry et al. 2011). Lowry et al. concludes that, "as an urban landscape matures over time, the proportion of vegetated landscape components shifts from turf grass to predominantly tree canopy cover, and this shift in turn influences landscape irrigation requirements" (Lowry et al. 2011, p. 200). Lowry et al.'s findings are especially relevant to drought-susceptible cities such as the City of Los Angeles where a decline in irrigation water demand resulting from the maturing of urban forests would greatly aid in the protection and preservation of the City's water supply.

In Lohr et al.'s (2004) previously mentioned study of how urban residents rate and rank benefits and problems associated with trees in cities, respondents ranked the fact that trees can cause allergies as the leading problem with trees in cities among eight potential problems (Lohr et al. 2004). Other costs related to urban forests included, in order of ranking, blocking store signs, cracking sidewalks, interfering with power lines, making it difficult to detect criminal behavior, and costing the city too much (Lohr et al. 2004).

Methods for Measuring and Predicting Impacts

Upon review of the benefits and costs associated with urban forests, the methods for measuring and predicting impacts will now be assessed. Furthermore, in the interest of understanding this topic as it relates to a specific geographic area and in reaction to AB 32, the City of Los Angeles will be utilized as the area of study.

In response to climate change and in realization of Los Angeles as a rapidly growing region of nearly 4 million people, Mayor Antonio Villaraigosa passed the Million Trees LA Initiative in an attempt to address the mounting challenges of improving air and water quality, alleviating water shortages, cooling urban heat islands, and reducing local flooding through the planting and stewardship of one million trees (McPherson et al. 2011). The goal of the Million Trees LA initiative is to create an extraordinary environmental legacy that will serve as a base for other environmental changes and to transform Los Angeles to a green, sustainable city (City of Los Angeles 2006). The potential impacts of the addition of a million trees to the City of Los Angeles's urban forest can be assessed by, first, delimiting the spatial extent of Los Angeles. An example of this initial step can be found in Oleyar et al.'s (2008) assessment of the urban forest function of King County, Washington where researchers first delineated urban forest patches across King County by using land cover classifications derived from a 1999 LANDSAT image (Oleyar et al. 2008).

In order to fully understand the implications of an additional million trees to Los Angeles's urban forest, the projection of future benefits from this proposed tree planting project will require "tree growth data because, as trees grow larger, the benefits they produce increases" (McPherson et al. 2011, p 41). According to McPherson et al. (2011), growth data that predicts benefits can be obtained through curve-fitting models tested for best fit as a function of age for each species. By then combining growth data with tree size, numerical benefit models can then be used to calculate annual benefits at 5-year intervals for a 40-year period after planting (McPherson et al. 2011).

Furthermore, to make benefit calculations realistic, differences in the mature size, growth rates, and mortality rates of different tree species need to be accounted for (McPherson et al. 2011). Mature size and growth rates can be obtained through the identification of tree species in combination with the location of the urban forest, or more specifically, the location of the tree plantings. Mortality rates can also be obtained through tree species identification, but should also take into account the broad-range of human-caused and natural challenges faced by urban forests. These challenges include insects and diseases, wildfire, natural catastrophic events, invasive plants, additional development, air pollution, and climate change (Nowak et al. 2010).

Benefits of urban forests can be priced by estimating the costs (McPherson et al. 2011). For example, in a study conducted by McPherson et al. (2011), "stormwater runoff reduction benefits were priced by estimating costs of

controlling stormwater runoff and treating sanitary waste" (McPherson et al. 2011, p. 44).

Programs for Implementation

The first step to developing a proper program for implementation, also referred to as an urban forest management plan, is to assess "the current composition and distribution of a community's trees and their associated ecosystem services" (Nowak et al. 2010, p. 14). This basic information is combined with community desires related to forests and ecosystem services in order to serve as the foundation for a long-term urban forest vision (Nowak et al. 2010).

Forest management programs also involve design guidelines, strategies, campaigns, and policies, for implementation and are comprised of a variety of activities, including:

> Inventorying tree populations, enacting tree and land use planning ordinances and policies, developing and implementing long-term management and maintenance plans, annual work plans, and budgets, and promoting community education and participation (Nowak et al. 2010, p. 13 quoted in Dwyer et al. 1992, Elmendorf et al. 2003).

The design guidelines of an urban forest management plan would include the selection of tree species that enhance the pedestrian character and convey a distinctive high quality visual image for the streets within a particular site. The design guidelines for Los Angeles would then include trees that are drought-, smog-, and fire- tolerant (City of Los Angeles 2000). Design guidelines would also establish a hierarchy for streets, listing the major accent trees to be located at entry locations, intersections, and activity centers; street trees for street frontages; and ornamental or special plantings along street frontages to emphasize and focus attention on those areas that are special. Design guidelines would also work to harmonize street trees with other landscape elements, such as street furniture, street lighting, sidewalks/paving, and signage.

However, despite the widely recognized benefits of urban forests, forest management programs have been difficult to develop and implement because the diversity of forest cover types, land uses, population densities, and land ownerships typically require complex, long-term urban forest management plans that are nearly impossible to enact due to a lack of funding, volunteer time, and information on appropriate management (Nowak et al. 2010). Fortunately, innovative tools with the potential to effectively manage urban forests at a lower, more reasonable cost are available. These tools include:

- i-Tree: a state-of-the-art, peer-reviewed software suite from the USDA Forest Service that provides urban and community forestry analysis and benefits assessment tools including i-Tree Eco (provides a broad picture of the entire urban forest), i-Tree Streets (focuses on the benefits provided by street trees), i-Tree Hydro (simulates the effects of changes in trees and impervious cover characteristics within a watershed on stream flow and water quality), i-Tree Vue (allows for the assessment of tree canopy by making available national land cover data maps), i-Tree Design (provides a platform for assessments of individual trees at the parcel level), and i-Tree Canopy (offers a way to produce statistically valid estimates of land cover types using aerial images) (i-Tree 2011);
- IPED: a web-based instructional series whose goal is to develop, disseminate, implement, and establish an accepted protocol for the detection and monitoring of pests (i-Tree 2011);
- Urban Forest Project Reporting Protocol: provides guidance to account for and report greenhouse gas emission reductions associated with a planned set of tree planting and maintenance activities to permanently increase carbon storage in trees (California Climate Action Registry 2008);
- TreeLink: utilizes technology to share knowledge with homeowners and landowners, nonprofit organizations, government land agencies and green business, and academic institutions in information resources, networking, and communication resources, and e-commerce and marketing resources (TreeLink 2011);
- CITYgreen: provides engineered green building and urban landscape solutions and conducts research on urban sustainability issues(CITYgreen 2011);
- Urban Forestry South: provides resources to support urban forest management plans (Urban Forestry South 2011);
- SelecTree and Tree Browser: a tree selection guide (Urban Forest Ecosystems Institute 2011);
- Forest Service web sites; and
- State forestry agencies (Nowak et al. 2010).

Conclusion

As urban forests provide multiple benefits and have been proven to positively influence ecosystems, it is recommended that trees should be a fundamental element in green streets projects (City of Los Angeles 2009) and urban forests should be given a significant role within a city's infrastructure through investment, campaigns, community workshops, and master planning. Furthermore, under the united support of local government and the community, it is important to care and plant urban trees, especially in inner-city areas and in clusters (Streiling & Matzarakis 2003).

Having evaluated the benefits and costs of urban forests, considered the methods used for measuring and predicting impacts, and provided an overview of forest management programs, including issues, strategies, campaigns, and policies, for implementation, in order to maintain the health and functionality of urban forests, it is strongly recommended that an investment be made in tree management and that the value of trees be established because "without an estimate of tree value, there is little to motivate investment in tree management" (McPherson 2007). In assessing the value of trees, the monetary worth based on people's perception of trees may be used in the form of a

cost-benefits analysis (McPherson 2007). Constraints and challenges related to the addition of urban forests, such as possible adverse impacts to sidewalk, curb and gutters, and underground utilities (City of Los Angeles 2009), should be included in any cost calculations.

As urban areas are difficult places for trees to grow due to the lack of water, space for root growth, and compacted soils, the choice of tree species in the urban forest is especially important to consider (Manning 2008). For example, the City of Los Angeles' Bureau of Street Services' Street Tree Selection Guide considers drought tolerance as an especially important quality for trees in its list of one hundred fifty species approved for the public right-of-way (City of Los Angeles 2009). Therefore, it is recommended that considerable time and effort be invested in evaluating and categorizing suitable trees. However, as the researching of suitable trees does not necessarily guarantee its implementation, it is also recommended that the City become involved in raising community awareness and involvement by creating policies that encourage substituting turf grass with trees and woody plants (Lowry et al. 2011).

In review of the innovative tools that have been and are currently being used to effectively manage urban forests at a lower, more reasonable cost are available, it will be important for urban forest management plans to include a technology component that reviews the technology. Furthermore, as technology is constantly evolving and advancing, it will also be important for plans to understand the nature of technology in order to provide for its effective use and maintenance.

Lastly, any and all policies placed upon the community meant to promote urban forests' care, management, and protection should be in line with the public's shared opinions toward trees (Lohr et al. 2004). Each city is specific to its own unique character and sense of place. In order for an urban forest management plan to best integrate with the fabric of a community, urban forest management plans must work within the context of the public's hopes, concerns, beliefs, and attitudes.

CRIME AND PLACE: THE RELATIONSHIP OF ENVIRONMENTAL DESIGN AND CRIME

Jana Perser

Introduction

Crime prevention can take many forms—the presence of a police force, education and awareness, neighborhood watch programs, security systems, etc. However, one of the less obvious forms of crime prevention is the very environment in which these activities take place, through the decisions made by planners and designers about the form of the built environment (Jeffery 1977, Newman 1972). This article is a review of some of the literature that discusses the relationship between the design and management of spaces and the occurrence of crime. It begins with a background on the development and principles of Crime Prevention Through Environmental Design (CPTED), then discusses the perception of risk and safety, factors that may lead to or prevent crime, strategies for preventing crime, and the evaluation of the effectiveness of CPTED. Finally, it considers the relevance of this topic for alley revitalization projects.

DEVELOPMENT OF "CRIME PREVENTION THROUGH ENVIRONMENTAL DESIGN" (CPTED)

The Urban Crime Problem

In 1968, President Johnson and the Congress passed the Safe Streets Act of 1968, in response to rapidly increasing urban crime rates. This act resulted in funding that supported Oscar Newman, then Director of the Institute of Planning and Housing at New York University, to conduct research and produce a book on the forms of New York's residential areas and how they lead to victimization by criminals (Newman 1972). His work made great progress in identifying problems within the built environment that may contribute to crime (Newman 1972). Buildings and housing projects that Newman determined were poorly designed had crime rates up to three times greater than adjacent projects that were home to demographically identical residents at similar densities (Newman 1972). He identified, in typical low- to middle-income housing projects that suffered high crime rates, characteristics that reinforce criminal behavior (Newman 1972). Three of these characteristics are: 1) projects housing over a thousand families, in high-rise towers over seven stories tall; 2) superblock sites closed to city traffic, created by combining four to six separate city blocks; and 3) positioning buildings freely, on grounds designed as one continuous space without differentiation relating to particular buildings or clusters (Newman 1972).

While Newman (1972) found crime to be higher for high-rise housing project towers, a recent study (Chang 2011) revealed a greater percentage of burglaries in buildings two stories or less. The Korean city in this study also had burglaries occurring frequently in two lane alleys with high levels of pedestrian and vehicular traffic (Chang 2011). This study reveals that the trend in location of crimes may be changing, or may be inconsistent across various times and places, and caution should be used when using Newman's (or other) theories to support contemporary design decisions.

Urban crime is prevalent not only in our homes and streets, but also our parks. Researchers have found that going to parks provides a psychological experience that is imperative for relaxation and happiness, yet "the concern and stigma of crime is threatening our park and recreation areas, especially in urban environments" (McCormick 2006, p. 35). In many instances, parks may be widely and safely used during the day, but after sunset become havens for deviant behavior. Foliage that is attractive may also provide cover for criminals (Jeffery 1977). In recent years, budget cuts have caused many communities to turn lights off in parks at night and consequently cases of vandalism are increasing (Beard 2010).

Newman (1972) notes that "in the area of crime prevention, physical design has been traditionally relegated the role of mechanical prevention, [such as stronger locks and higher fences,] leaving intact the structure of motivation and attitudes which eventually lead to the criminal event" (p. 4). Small town environments that once formulated and enforced their own moral codes are being replaced with dense and expansive urban metropolises in which residents are ever more interdependent and vulnerable to deviant behavior (Newman 1972). "The physical environments we have been building in our cities for the past twenty-five years actually prevent such amity and discourage pursuit of collective action," Newman warned in his 1972 book, Defensible Space (pp. 1-2). Physical neighbors rarely share beliefs or values; while this leads to a diverse intellectual atmosphere, it inhibits the ability of communities to agree on how to maintain the social framework that creates a safe environment (Newman 1972). Gardiner (1978) notes the important connection between the neighborhood and safety:

> First and foremost, it is the neighborhood that acts as the interface between home and city and provides opportunity for human interaction and cooperation. The neighborhood is the scale at which communal standards of behavior are first formed... If crime cannot be controlled at the neighborhood, it will eventually undermine the entire city (in Poyner 1983, p. 15).

Still today, increasing urban crime rates indicate that we have yet to learn to manage the new social modes of our cities (Chang 2011). In a 1992 study, researchers reported that "fear of criminal victimization threatens the quality of life of many Americans [and] almost half of the U.S. population has reported feeling unsafe in areas within a mile of their homes" (in McCormick 2006, p. 35). As citizens' fear of their shared environment increases, they withdraw into their private homes, lowering surveillance and thus leading to higher crime rates. "Fear of crime leads to withdrawal which further increases the danger of crime and therefore the fear response to crime" (Jeffery 1977, p. 194). This cycle, however, may be reversed through appropriate planning and design of our

physical environments (Jeffery 1977).

Precursors of CPTED

"One of the most logical, least expensive and most effective security initiatives is the oldest and the most often ignored—the built environment" (Lusher in McCormick 2006, p. 37). However, sociological research has in the past taken the position that the environment is social, not physical. Jeffery argues, "The fact that men live in a physical environment has been totally ignored in sociological writings" (1977, p. 185). Early studies on the relationship between crime and the environment (Sutherland, Shaw, and McKay in the 1920s to 1960s in Jeffery 1977) focused on "individual offenders, not offenses" and the environment as the "social normative environment, not the physical environment" (Jeffery 1977, p. 189-190).

Jeffery (1977) credits a 1968 paper by Angel as being one of the forerunners the development of crime prevention and environmental design. Angel linked crime rates to the social and physical environments, territoriality, accessibility, and victim behavior; and identified witnesses, surveillance, and community awareness as crime deterrents (Jeffery 1977). Similarly, Jane Jacobs noted that having many eyes on a street will contribute to its safety (Jeffery 1977, Jacobs 1961).

This article begins with Oscar Newman's book, *Defensible Space*, published in 1972. Yet it easily could trace the roots of CPTED further back in history, as Newman credits Elizabeth Wood, Jane Jacobs, Robert Sommer, Edward Hall, Christopher Alexander, Marc Fried, Walter Fiery, and Lee Rainwater as some who have preceded him in recognizing the significance of points he makes (1972). However, to maintain brevity, Newman provides a logical and acceptable starting point. C. Ray Jeffery first wrote *Crime Prevention Through Environmental Design* in 1971, but did a total revision of the work and republished it in 1977. In his revised edition, Jeffery (1977) discussed the contributions of Newman to the theory and principles of CPTED. It was Newman's 1972 book that attracted broad attention to and exploration of the relationship between crime and environmental design (Jeffery 1977).

Newman's Elements of Defensible Space

Oscar Newman's "defensible space" refers to a range of means—"real and symbolic barriers, strongly defined areas of influence, and improved opportunities for surveillance"—by which, when used together, an environment can be better controlled by its residents (Newman 1972, p. 3). His model is for residential environments in particular, and works to prevent crime by physically expressing "a social fabric that defends itself" (Newman 1972, p. 3). Newman suggested clustering residential units to augment mutually beneficial associations; clearly defining paths of movement and areas of activity for specific users; and "providing for natural opportunities for visual surveillance" in order to clearly express the function of a space and who the users of it are and should be (Newman 1972, p. 4). All elements of a defensible space share the goal of creating "an environment in which latent territoriality and sense of community in the inhabitants can be translated into responsibility for ensuring a safe, productive, and well-maintained living space" (Newman 1972, p. 3).

Newman (1972) outlines four elements of physical environmental design, regarding residential developments, that work independently and together to create secure environments: territoriality, surveillance, building style and form, and development location.

Territoriality

Territoriality refers to defining areas of space to reflect the influence of the inhabitants (Newman 1972). By dividing larger shared spaces into zones, residents may more easily adopt attitudes of ownership (Newman 1972). Newman (1972) explains, "for one group to be able to set the norms of behavior and the nature of activity possible within a particular place, it is necessary that it have clear, unquestionable control over what can occur there" (p. 2). The design of buildings and landscapes can make clear that a particular area is an extension of a group of residents' private domains (Newman 1972). Both resident and stranger will know that the area is under the influence of a particular group, which determines the activity that takes place in that space and who should and should not be there (Newman 1972). When the territoriality of a space is unquestionably defined, residents will feel confident and will naturally question the comings and goings of people through that space (Newman 1972). Any intruder will perceive that their presence will be under question, and therefore may be deterred from entering the area (Newman 1972, Jacobs 1961).

Surveillance

The second element pertains to surveillance—positioning apartment windows so residents can naturally survey both exterior and interior public areas, and also regarding building entrances and exterior circulation (Newman 1972). Pedestrian circulation is imperative to the safety of streets: "the street without the continued presence of the citizen, will never be made to function safely for him" (Newman 1972, p. 14-15). The decision to "protect" a building by providing a guard or doorman means the building will only have one entrance (Newman 1972). By confining all entry and exit to one location, potentially thousands of feet of street are essentially removed from social and visual contact (Newman 1972). The designer should consider ways in which to integrate the building and residents with the greater community—the development should protect the street and itself, while the street life should also protect the development (Newman 1972).

Image

Third is implementing building styles and forms that will not be stigmatized as being peculiar, and that do not portray the inhabitants as being isolated or vulnerable (Newman 1972). The appearance of the buildings should be designed to avoid the stigma usually associated with public housing (Poyner 1983).

Context

The fourth element increases safety by locating residential developments in urban areas with functions that are compatible and adjacent to non-threatening activities (Newman 1972). Residential projects should face heavily trafficked streets, institutional areas, government offices, or other areas typically considered to be safe (Poyner 1983). Recent research found that burglaries in a study area were occurring because the area as a whole was vulnerable through its spatial structure, not just the specific spaces or buildings where the crimes were occurring (Chang 2011). Therefore it is important to not focus solely on a particular site, but to consider its surrounding context as well.

PRINCIPLES OF CPTED

First Generation CPTED

Crime Prevention Through Environmental Design is based on the work of researchers from the mid-twentieth century to the mid-1980s (Cozens, Saville and Hillier 2005). Lynch (1960), Jacobs (1961), Angel (1968), Jeffery (1971, 1977), Newman (1972), Gardiner (1978), Clarke and Mayhew (1980), Poyner (1983), and Coleman (1985) are frequently cited (Cozens, Saville and Hillier 2005). CPTED builds upon the ideas (summarized in this article) that were set forth by Newman in Defensible Space, with some differences. The key principles of CPTED include: territoriality, natural surveillance, natural access or movement control, image or maintenance, activity or program support, and target hardening (Beard 2010; McCormick 2006; Saville and Hillier 2005; Moffat 1983 in Cozens 2005; Wallis and Ford 1980 in Poyner 1983). Poyner (1983) also mentions motivational reinforcement.

Territoriality, as in Defensible Spaces, is used to distinguish between public and private areas (Beard 2010, McCormick 2006). By reinforcing sense of ownership in legitimate users of a space, illegitimate users are discouraged (Beard 2010, McCormick 2006, Cozens et al. 2005). Territoriality can be established through both symbolic barriers, such as signage, and real barriers, including fences or other clear delineations between private, semi-private, and public spaces (Cozens et al. 2005). CPTED takes this principle beyond the context of the residential housing development and applies it more broadly to parks and other public spaces. Although research supports a link between enhanced territoriality and decreases in crime and fear of crime, it can be problematic as it is interpreted differently between cultures, neighborhoods, and individual groups (Cozens et al. 2005)

1st Generation CPTED	2nd Generation CPTED
Access/Movement Control	Access/Movement
Natural Surveillance	Surveillance
Territoriality	Ownership
Target Hardening	Physical Protection
Image/Maintenace	Management/Maintenance
Activity/Program Support	Activity
	Structure

The principles of 1st and 2nd Generation CPTED remain relatively the same (Cozens et al.)(2008)

Natural surveillance refers to designing and maintaining the environment so that people within a space can easily be seen by others in the space or passing by (McCormick 2006, Cozens et al. 2005). By increasing surveillance, the risk of an offender being seen, identified, and apprehended is also increased (Cozens et al. 2005, Poyner 1983). Therefore, improving the visibility into and out of critical areas, such as playgrounds and parking lots, will improve the safety of these areas. Poyner (1983) suggests increasing surveillance by improving lighting, eliminating blind spots, using windows or electronic surveillance, locating vulnerable areas near busy areas, and including supervisory personnel, police or security guards, or a neighborhood watch. Drawing from Barr and Pease (1992), Cozens et al. (2005) note, "However, the existence of natural surveillance opportunities within the built environment does not necessarily mean that surveillance is routinely taking place, or that any direct action by citizens (e.g. challenging, reporting or direct intervention) is guaranteed" (p. 332). They add, "Indeed, this is one of the reasons for the development of second generation CPTED, which now seeks to engender positive social activities and diversity to encourage neighbours to take ownership of space and take advantage of natural surveillance" (Cozens et al. 2005, p. 332).

Natural access or movement control is controlling the behavior of those who are entering, moving through, or leaving an area (Beard 2010, Poyner 1983). It focuses on "reducing opportunities for crime by denying access to potential targets and creating a heightened perception of risk in offenders" (Cozens et al. 2005, p. 335). Clearly defining where people should be entering and exiting is a form of natural access control (Poyner 1983). Newman's real and symbolic barriers (associated with territoriality) as well as actual security hardware are ways to limit movement of a potential offender through a site (Poyner 1983). Other means include limiting the number of entrances, keyed access to various zones within a building, street closure, controlled-access neighborhoods, and reducing congestion within facilities (Poyner 1983).

The image or maintenance principle

considers that an area that appears to be cared for and kept up will tend to deter vandalism and other acts of crime (Beard 2010, Cozens et al. 2005). This principle relates to the much researched and developed "Broken Windows" thesis by Wilson and Kelling (1982). This research stressed the importance of the maintenance of the physical environment as an indication of social cohesion and informal social control (Wilson and Kelling 1982).

Program or activity support involves "programming different compatible activities for the same area," which has the effect of further improving natural surveillance and territoriality (McCormick 2006, p. 39). Design and signage should encourage the intended usage of public space (Cozens et al. 2005). Use may also be increased by making an area more attractive or by rearranging the existing facilities or activities (McKay 2004, Poyner 1983). Specific examples include "creating activity areas, providing information kiosks, displays areas, portable theatres for street activity, clustering commercial establishments with similar operating hours, and diversifying land use" (Poyner 1983, p. 10-11).

Target hardening is the most traditional approach to crime prevention (Cozens et al. 2005). It involves increasing the effort a criminal must put forth in order to commit a crime (Cozens et al. 2005). There is debate concerning whether target hardening should be included as a component of CPTED, as excessive use of these tactics (fences, gates, burglar bars, alarms, etc.) can lead to a "fortress mentality" in which residents withdraw behind physical barriers, working against efforts based on territoriality, surveillance, and image (Cozens et al. 2005, p. 338).

The final principle discussed in this paper is motivational reinforcement. Although not as clearly defined, Poyner (1983) states that motivational reinforcement "is necessary alongside the physical changes to enhance the desire of people to engage in crime prevention activity" (p. 11). Methods include encouraging personalized environments (such as including community-created art), increased maintenance in public areas, cooperation with area business owners, community development programs, and improved police and community relations (Poyner 1983).

Second Generation CPTED

Theoretical criticisms and ongoing refinement of the original ideas of CPTED have resulted in what is now known as second generation CPTED (Cozens et al. 2005). The primary concern is to reduce opportunities for crime and improve community safety, through the sustainable and creative design of products, spaces, and places (Cozens, Thorn and Hillier 2008). Second generation CPTED supplements physical design interventions with additional focus on social factors such as risk assessments, socioeconomic and demographic profiling, and active community participation (Cozens et al. 2005). Seven key characteristics of safe and enduring environments, which build upon the original principles of CPTED, are identified in contemporary guidelines (Office of the Deputy Prime Minister 2004); they are:

(1)Access and movement: Places with well-defined routes, spaces and entrances that provide for convenient movement without compromising security.

(2)Structure: Places that are structured so that different uses do not promote conflict.

(3)Surveillance: Places where all publicly accessible spaces are overlooked.

(4)Ownership: Places that promote a sense of ownership, respect, territorial responsibility and community.

(5)Physical protection: Places that incorporate necessary, well-designed security features.

(6)Activity: Places where the level of human activity is appropriate to the location and creates a reduced risk of crime and a sense of safety at all times.

(7)Management and maintenance: Places that are designed with management and maintenance in mind, to discourage crime in the present and the future (Cozens et al. 2008, p. 297).

PERCEPTIONS OF RISK AND SAFETY

In a 2009 study (Mason, Mennis, Coatsworth, Valente, Lawrence and Pate), researchers sought to discover what factors affect youth's perceptions of places they regularly occupy as being either safe or risky. The researchers argue that the interpretation of the meaning of a place influences the behavior of individuals within it. They hypothesized that places perceived as risky would have a concentration of risky features, such as crime, vacant housing, poverty, and alcohol availability. Meanwhile, places perceived as safe would have features such as recreation centers, churches, and after-school programs (Mason et al. 2009).

The study participants were aged 13-20, residents of Philadelphia, and predominantly African-American (reflective of the general neighborhood racial composition) (Mason et al. 2009). The researchers divided the study group by substance users and non-users (Mason et al. 2009). Participants were asked to list their weekly routine locations, and were asked which of the places is the most important, which is the safest, which is the riskiest, and which is their favorite (Mason et al. 2009). For the purposes of the study, "safe places" were defined as "safest place from harm, danger, or the likelihood of engaging in risky or dangerous activities", and "risky places" were defined as "the place where you are most likely to engage in risky or dangerous activities, cause trouble, or do illegal activities" (Mason et al. 2009, p. 487). The reasons provided by study participants for labeling a place as "safe" or "risky" were categorized into four headings: "social reasons (based on peers, families, others), environmental reasons (based on the setting), psychological reasons (based on internally focused responses such as comfort, calmness, security), and individual activity reasons

(based on activities done alone, such as running, smoking)" (Mason et al. 2009, p. 487).

The study revealed that despite living in a characteristically unsafe neighborhood, "home" was perceived as safe much more often than it was perceived as risky (Mason et al. 2009). Additionally, the non-substance-using youth perceive locations as safe when they closely resemble their homes in relation to racial and ethnic compositions, crime, and poverty (Mason et al. 2009). More than the environmental setting, "a location is perceived as safe through interactions between the social context of the setting and one's psychological response to the context" (Mason et al. 2009, p. 491). On the other hand, risky locations are perceived as risky as a result of "interactions between risky people and risky settings" (Mason et al. 2009, p. 491).

As environmental designers, an important lesson to note from this study is that the environmental setting has a greater effect on perception of a place as being risky, than of it being safe (40% versus 17%); and social factors have a significant effect on perception of both safety and risk (50% and 59%, respectively) (Mason et al. 2009). As noted previously, "risky" was defined as a location where the youth are more likely to cause trouble or engage in illegal activities (Mason et al. 2009). As environmental setting plays a substantial role in determining whether youth interpret a place as risky or not, environmental designers have the opportunity to influence whether or not youth are likely to commit crimes in a place.

FACTORS THAT MAY LEAD TO OR PREVENT CRIME

A Focus on Lighting

Proper lighting is one of the first aspects of the environment that may come to mind when considering crime and crime prevention. However, achieving appropriate lighting is not as straightforward as might be expected. Too much lighting can be just as problematic as not enough. For example, overusing park lighting after the park has closed can send the signal that the park is still open for use (McKay 2004). Thomas McKay (2004), police officer and Crime Prevention Through Environmental Design Specialist in Ontario, Canada, explains:

Constant light sends the signal that the park is still open. This is a conditioned response that results from our daily experiences where the presence of light signifies the park is open, and the dimming or absence of light signifies that it is closed. ...Late night users of the park use this frame of reference when deciding whether to enter, exit, or stay in the park (p. 65).

A reduction in lighting communicates to park users that the park is closing; this lets users know it is time to leave, and eliminates excuses for any who stay behind after closure (McKay2004). Timers and a "high/low" lighting system can be strategically utilized, and can also result in savings in maintenance and electricity costs (McKay 2004).

Additionally, areas that are well-lit at night, but isolated, may actually lead to increased victimization (McKay 2004). The lights lead the potential victim along the path, but the glare prevents them from being able to see into the dark areas beyond (McKay 2004). The criminal can wait in the shadows, selecting their target and watching out for potential witnesses and interveners (McKay 2004). McKay (2004) proposes removing lights from walkways that do not have safe levels of activity at night. With the lights removed, people will naturally select other routes, which are well-lit and more populated (McKay 2004). Those who do continue to use the unlit pathway will be more likely to travel in groups, pairs, or with dogs (McKay 2004). Criminals will be less attracted to the route, as it will have fewer and less desirable potential victims using it (McKay 2004).

On the other hand, unlit areas – in particular playgrounds – can become a magnet for unintended and potentially destructive or dangerous behavior at night (McKay 2004). Playgrounds should be located where they can be observed by surrounding residents and passersby (McKay 2004). Ensuring the playground structure is well-lit will enable witnesses to see it, and discourage inappropriate behavior there (McKay 2004). According to McKay (2004), "the installation of light adjacent to three problem playgrounds in the ... city of Mississauga, Ontario, in Canada has completely resolved a series of problems that were previously reported" (p. 65).

A study of the change in crime rates after lighting improvements in two residential neighborhoods in the United Kingdom provides evidence that increased street lighting can result in crime reductions (Painter and Farrington 2001). In both neighborhoods, the old lights (mercury lamps in one neighborhood, tungsten lamps in the other) were replaced with brighter high pressure sodium lights (Painter and Farrington 2001). Additionally, in one of the neighborhoods, previously unlit detached footpaths between houses were provided illumination (Painter and Farrington 2001). In the first neighborhood, the amount of useful light was doubled; in the second it was increased by a factor of five (Painter and Farrington 2001). The study, which compared crime rates before and after the lighting improvements, found that not only did crime rates decrease in the neighborhoods with improvements, but there was also a diffusion of benefits to adjacent areas (Painter and Farrington 2001). Furthermore, a comparison of costs associated with crime and the costs of the lighting improvements revealed that savings from the reduced crime rate more than paid for the cost of the lighting project (Painter and Farrington 2001).

While lighting is certainly an element that affects the level of a place's safety, it ultimately takes a variety of factors working together. "People ... tend to unconditionally equate lighting with improved safety, and believe that the presence of lighting alone is enough to improve safety. ...A safe environment only occurs when lighting and witnesses are combined. A populated walkway,

over the isolated one, has all the elements to make it safe" (McKay 2004, p. 63).

Social Factors

Environmental design takes into account the social aspects of a place, which are often not as tangible as the physical aspects; who the users are, how they use the space, how their activities and behaviors interact with the built environment should all be considered. Even less tangible though is how people's attitudes and behaviors, beyond the limits of the designed site, may impact the success of the design. Are there social conditions that may predict levels of crime? A study by Brown, Perkins, and Brown (2004) seeks to answer this question by examining the incivilities thesis (incivilities are physical signs of decay or disorder). Their hypothesis is "that weaker place attachments, more observed incivilities, more perceived incivilities, and weaker social ties ... predict crime" (Brown, Perkins and Brown 2004, p. 362). The study found that neighborhood blocks with more incivilities than other blocks in the neighborhood posed increased risk of crime to individual households, regardless of whether or not the individual property exhibited incivilities (Brown et al. 2004). The results of their study suggest that reducing observable incivilities and increasing residents' place attachment should reduce crime (Brown et al. 2004). Therefore, neighborhood improvements should focus on these two objectives (Brown et al. 2004).

There have also been studies to examine the relationship between recreation programs for youth and crime. Jamieson and Ross (2007) suggest the benefits of recreation programs for youth may prevent them from committing crimes; their results "suggested that participation in recreation activities can provide an antidote to antisocial behavior in youth through the development of social skills, linkage with positive adult role models, development of cognitive skills, and increasing self-confidence and self-esteem" (p. 28). Indeed, a study by Schinke, Orlandi and Cole (1992, in Welsh and Hoshi 2002) that examined the impact of Boys and Girls Clubs in public housing sites in the United States found that housing sites that had the programs available for youth "had fewer damaged units and less criminal activity than housing projects without clubs. There was also an overall reduction in substance abuse, drug trafficking and other drug-related criminal activity" (Welsh and Hoshi 2002, p. 186). In their review of research concerning crime and youth recreation programs, Welsh and Hoshi (2002) conclude that afterschool recreation opportunities in the community are likely to prevent juvenile crime, however the results are typically restricted to the immediate area of the recreation center. Ensuring there are opportunities for youth recreation programs in a community is, therefore, another way environmental designers can combine interventions in the physical environment with social programs.

STRATEGIES FOR PREVENTING CRIME

The most effective strategies for preventing crime through environmental design will combine tactics involving the physical built environment and the social environment of the community. Physical tactics work when they positively affect the behavior of the space's users. For example, crime reduction may be achieved by distributing or redistributing activities throughout a park in order to maintain "a safe critical intensity of people" through all areas of the park (McKay 2004, p. 64). Social strategies are more typically policy or guidelines that will enable communities to change their behavior in ways that help reduce crime. In Western Australia, for example, policy on designing out crime includes actions such as:

> Ensure the community is consulted and actively involved with government agencies and industry on crime prevention and community safety initiatives; continue the 'Eyes on the Street' program to train and encourage local government and targeted commercial agencies, outdoor workers, parks and garden officers, rangers and security officers to record and report suspicious persons or events..." (Cozens, Thorn and Hiller 2008, pp. 301-302).

Despite the best physical design intentions, without community awareness and involvement crime reduction measures will not be nearly as effective.

EVALUATION OF THE EFFECTIVENESS OF CPTED

Analyzing projects that have implemented CPTED principles and evaluating the effectiveness of the methods is instrumental for knowing what CPTED strategies to employ in the future. Numerous studies have been conducted to test for the effects of projects on crime reduction, and results are mixed.

One of the biggest obstacles to understanding the success of CPTED projects is having the resources to conduct rigorous, meaningful studies before and after the project's implementation (Welsh and Hoshi 2002). Although stated over two decades ago, the words of Dennis Rosenbaum (1988) still ring true: "The primary reason why we do not know 'what works' in community crime prevention is the quality of the evaluation research" (p. 381, quoted in Welsh and Hoshi 2002, p. 191). There continues to exist a real need for academic research evaluating the effectiveness of crime prevention projects (Welsh and Hoshi 2002).

Methods for Evaluations

When resources are available to conduct these kinds of studies, a clear understanding of what is being measured and the most appropriate way to collect the data is necessary. For example, in the incivilities study by Brown et al. (2004), they noted that observed physical incivilities and reports of residents' perceptions of incivilities do not provide the same measurement. They collected data through both trained observer reports and resident reports, and found that observed physical incivilities more closely relate to police reports of crime than do the residents' perceptions (Brown et al. 2004).

Decisions must also be made concerning

how to collect information on crime. Brown et al. (2004) differentiate between initial calls for police service, and final police reports. Final police reports will provide a more indicative measure of actual crime, as they are only made if police agree there is evidence of a crime (Brown et al. 2004). Initial calls may provide more information on resident perceptions of crime (Brown et al. 2004). Additionally, the evaluation may focus on particular types of crime – for instance vandalism or burglary – or cover a range of property and personal crimes (Painter and Farrington 2001).

Due to the complexity of crime patterns, it may be beneficial to have a control area with which to compare the project area. In Painter and Farrington's (2001) research, control areas were selected that shared as many characteristics with the study areas as possible (houses built at about the same time, similar architectural styles, similar demographics, similar densities, etc.) Surveys were carried out in the experimental areas where lighting was improved and in the control areas without lighting improvements, to assess the incidence of crimes 12 months before the improvements and 12 months after (Painter and Farrington 2001). A control area will help determine whether changes in crime were the result of the improvements, or if some other factor may be at work.

Variations in scale will reveal different patterns. Most crime studies focus on the neighborhood scale, and the differences in crime rates between neighborhoods (Brown et al. 2004). However, studies that examine blocks also reveal variations in crime patterns within a neighborhood (Brown et al. 2004). "Indeed, blocks vary in cohesion and attachment, depending on block stability, norms, design, land use, traffic, and other qualities. Residential blocks are then an appropriate unit of analysis for studying crime" (Brown et al. 2004, p. 361). This level of analysis is also particularly appropriate in declining neighborhoods, as decline does not occur evenly across all blocks simultaneously (Brown et al. 2004).

Painter and Farrington (2001) chose to measure the effectiveness of lighting improvements through an economic analysis of crime reduction. Crimes result in both tangible and intangible costs to the victims and community (Painter and Farrington 2001). Tangible costs include, among others, the cost of the stolen or damaged property and medical and police services; an example of an intangible cost is the cost of the victim's pain or suffering (Painter and Farrington 2001). This study considered only tangible costs (Painter and Farrington 2001). They examined government estimates of the financial costs of different types of crimes to calculate the approximate cost of the crimes occurring in the study neighborhoods (Painter and Farrington 2001). They used these crime cost estimates to determine the savings from costs not incurred as a result of the crime reductions after the lighting improvements (Painter and Farrington 2001). The crime cost savings were then compared with the financial costs of the improved lighting project (converted to a yearly cost) to determine whether or not there had been a net savings from the reduction in crime (Painter and Farrington 2001). In both of the experimental areas "the financial savings from reduced crimes in one year more than outweighed the full capital costs of the improved lighting" (Painter and Farrington 2001, p. 3.)

There are numerous other factors to consider when designing an evaluation of a crime prevention project. A review of studies conducted on other similar projects will provide more specific information relevant to the project to be evaluated. Perhaps most importantly, start planning the evaluation as soon as possible in order to most effectively be equipped to evaluate existing, "before" conditions.

Outcomes

Painter and Farrington's (2001) "results showed that the incidence of crimes (average crimes per 100 households) decreased by 41% in the experimental area after the improved lighting, compared with a decrease of 15% in the control area" (p. 4). Reductions in vehicle crimes (49% experimental area, 16% control area) and personal crimes (41% experimental area, 5% control area) were the greatest (Painter and Farrington 2001). Decreases in crime for all categories in the experimental area were statistically significant, while none of the decreases in the control area were statistically significant (Painter and Farrington 2001). The conclusion based on these results is that the improved street lighting contributed to a substantial decrease in crime in this study (Painter and Farrington 2001). Additional lighting studies in the UK also found decreases in crime and disorder (Painter 1991a and 1991b in Cozens et al. 2005), yet others reported a potential for reducing the fear of crime without any real effect on crime rates (Atkins et al. 1991 and Ramsay 1991 in Cozens et al. 2005). A recent systematic review of lighting and crime research by Farrington and Welsh (2002, in Cozens et al. 2005) found that improved lighting did reduce crime rates, and that crime reductions were also occurring during the day. This study suggested that "street lighting is likely to have an effect by increasing community pride and informal social control rather than by simply improving surveillance opportunities" (Cozens et al. 2005, p. 335).

However, when referencing the effectiveness of crime prevention projects, we should consider factors that may cause different outcomes—differences in conditions before the improvement, differences in what improvements are made, cultural differences, alley versus street dynamics, etc. A similar lighting improvement project carried out in a different environmental and cultural setting may produce different results.

RELEVANCE TO ALLEY REVITALIZATION PROJECTS

The literature reviewed in this paper supports the topic of crime prevention and environmental design, and, more specifically, 1) how spaces can be designed and managed to reduce illegal behaviors, 2) how social development and community cohesion relate

to opportunities for crime, and 3) considerations for evaluating CPTED effectiveness. These three points are relevant to a wide variety of community design projects, including alley revitalizations.

Crime Prevention Through Environmental Design has been studied and implemented since the 1970s. After forty years of development, it has much to offer to alley revitalization projects, which are currently gaining momentum in cities across the United States. These projects range in scope and focus, from extensive citywide networks to isolated neighborhood projects, from infrastructure updates and environmental "greening" to embedding social functions in these underutilized spaces.

The South Los Angeles Green Alley Master Plan intends to address a range of issues through analysis and design guidelines for the alleys within 18 square miles of South Los Angeles. Some of the key objectives of this project are to improve watershed health, reduce greenhouse gas emissions, mitigate the urban heat island effect, reduce illegal behaviors and improve safety, enhance community connections, and increase the area of public open space for recreation. Many of the alleys within the study area have a history of crime – burglary, assault, dumping, graffiti – and many of the residents who live alongside them are afraid to go into the alleys (Seymour, Bradbury, Wolch, and Reynolds 2008). An understanding of the relationship between crime and the physical and social environment of the alleys is crucial to the master plan achieving its goals of reducing crime, improving safety, and providing space for active recreation. The resources reviewed in this article can help contribute to understanding that relationship, and to developing appropriate environmental design solutions. Improving alley lighting, integrating recreation opportunities for youth, encouraging increased care of private property, and fostering community involvement throughout the project's phases may all be feasible approaches for reducing crime in the alley networks.

Conclusion

In summary, the relationship between the built environment and crime is a complex one. This topic began to take hold in research during the mid to late twentieth century, and has continued to be explored and expanded upon since that time. To gain an understanding of the origins of this research, the writings of Lynch, Jacobs, Angel, Jeffery, Newman, Gardiner, Clark and Mayhew, Poyner, and Coleman will provide a solid background (Cozens et al. 2005). From here, there are many directions to pursue.

This paper sought to explore both social and physical elements that relate to designing against crime. The perceptions of risk and safety of the users of a space will affect the way they behave in and use the space (Mason et al. 2009). For youth, the physical environment affects whether or not they perceive a place as risky, while social factors play a role in their sense of safety (Mason et al. 2009).

As the background on CPTED suggested, there are many physical design aspects that can make a place safer by discouraging crime. This paper focused on the role of lighting, noting that too much lighting can cause problems, just as not enough lighting can (McKay 2004, Painter and Farrington 2001). However, the social environment of a place can affect crime, toK. Reducing incivilities in a neighborhood can protect the homes there from crime (Brown et al. 2004), and providing recreational opportunities for youth has also demonstrated a reduction in neighborhood crime (Jamieson and Ross 2007, Welsh and Hoshi 2002). The best crime prevention strategies will combine physical design tactics with social involvement (Cozens et al. 2008, McKay 2004). Unfortunately, the effectiveness of CPTED strategies has been difficult to gauge due to the shortage of rigorous studies (Welsh and Hoshi 2002). While there are numerous studies with results supporting the success of CPTED-related projects, there are just as many (if not more) that show no positive effect or inconclusive evidence (Cozens et al. 2005, Eck 2002). Additionally, many other efforts have been implemented without any evaluation. As crime prevention and environmental design projects become more prevalent, there will likely be more studies to determine their effectiveness. This topic gains relevance with alley revitalization projects underway in multiple cities across the United States. Increased knowledge of the design strategies that may improve public safety in these historically crime-ridden places will increase the potential for the success of these efforts.

GREENWAYS GREAT AND SMALL

Paul Dillingham

> *The dream is to spiderweb this entire nation with so many green threads, principally along streams and ridges, that every citizen would be only minutes away from one.*
>
> — Noel Grove, "Greenways: those long, skinny, green parks" (1994)

When the idea was raised a few years ago that the 388 acres of the West Los Angeles Medical Center, on federal Veterans Affairs property, could potentially be put to better use, the Los Angeles Times ran an editorial advocating for its reclamation as park space for a city with a chronic open space deficit (Los Angeles Times 2007). The editorial implied that the need for park space need not have been so acute, if only we had read and heeded the Olmsted-Bartholomew Plan (Olmsted and Bartholomew 1930) formulated eighty years ago, before much of the current Los Angeles metropolitan region was developed. That plan included dozens of open space corridors, connecting cities along rivers, ridges, and parkway routes, which would have provided open space access to millions of Angelenos as well as a sense of connection among neighboring communities.

Looking at the open space corridors on the Olmsted and Bartholomew plan today, we would likely refer to them as greenways. What are greenways? One definition is "networks of land containing linear elements that are planned, designed and managed for multiple purposes including ecological, recreational, cultural, aesthetic, or other purposes compatible with the concept of sustainable land use" (Ahern 1995, p. 134).

Although the current motivations behind the development of greenways remain largely the same as they were when first discussed forty years ago, the planning and design processes have developed during this time to respond to various and complex conditions. This paper aims to look at the history and multiple conceptions of urban greenways in North America, as well as some design and planning principles that have determined the success of individual projects.

Definition

Ahern's (1995) above definition clearly incorporates the common intents of greenway planners and academics. The intent of Ahern's (1995) article in which he proposed this definition was to clarify disparate usage. He may have succeeded partially within academia, but practitioners are not as careful with their choice of words. Little's (1990) multiple definitions on the first page of his earlier book Greenways for America (1990) is evidence of the many ways the term has been used. Erickson is clearer, if not as succinct as Ahern (1995):

> Greenways are linear open spaces along natural or human-made features such as rivers, ridgelines, railroads, canals, or roads. They are planned, designed, and managed to connect and protect ecological, scenic, recreational, and cultural resources. A greenway may include trails, or it may be a conservation corridor without recreational access ... They are sometimes referred to by other names... (Erickson 2006, p. 34)

Erickson's (2006) definition is preferable because it includes corridors which are not currently part of a larger network, but which still serve multiple purposes, and which connect local landmarks. Both of these definitions note that these corridors and networks are planned developments, but neither clarify that multiple portions of a network may not be planned together, and may even be planned decades apart. The other thing to add to these definitions is that the most important cultural resources that greenways connect are the people who use them, and that in so doing, these greenways create a sense of place and community.

Ahern (1995) points to five ideas which compose his definition. First, greenways are linear, and thus much of their planning discusses the potential movement of people, species, and ecological resources. Second, greenways create linkages, which in turn form a system with unique properties that cities without linkages lack. Third, greenways are planned to be multi-functional, which makes goal-setting, compromise, and compatibility key aspects of the planning process. Fourth, greenway development can be seen as part of the sustainable development movement, balancing current community needs with the presumed needs of future generations, although Lindsey (2003) claims we still lack the metrics to demonstrate how sustainable our comprehensive and incremental greenway planning efforts are. Fifth, greenways are but one strategy to protect and connect key parts of our landscapes, especially linear parts, and thus can only complement comprehensive planning efforts.

The term greenway appears to be a twentieth century invention, a combination of greenbelt and parkway (Little 1990). The first found reference to a greenway is in William Whyte's 1959 monograph, *Securing Open Space for Urban America* (Whyte 1959, p. 23). By 1968, planners and policy-makers had begun to understand the entrenched interests of urban development, how battle lines had been drawn, and where to concentrate their efforts:

> Linkage is the key. Most of the big tracts in our metropolitan areas have already been saved, or they have already been lost. The most pressing need now is to weave together a host of seemingly disparate elements—an experimental farm, a private golf course, a local park, the spaces of a cluster subdivision, the edge of a new freeway right-of-way. (Whyte 1968a, p. 162, quoted in Erickson 2004, p. 199)

It should be highlighted why the term greenway can become a source of confusion. Hellmund and Smith (2006) make a useful clarification by comparing thirty terms related to "greenways and greenwaylike designations" (2006,

p.2), almost all of which arise from the same landscape ecology theories (Ahern 1995). Instead of reprinting the comparison table in its entirety, we can highlight some definitions which may make helpful distinctions, definitions which often have slightly different connotations in each country. The term open space is ambiguous in both the public's mind and within the professional literature. Authors may define the term based upon its context, leading to conflicting definitions when transported to other contexts (Erickson 2006). Greenspace refers to protected lands; greenbelts protect natural lands in order to ring and restrict metropolitan growth; conversely, green hearts protect large open spaces surrounded by development; green fingers purify stormwater through bioswales (not to be confused with green veins, networks of linear elements to protect biodiversity in agricultural settings). Green links connect multiple open spaces, whereas greenstructure connects open space as part of a process of designating land for development. The context of the more common term, green infrastructure, is usually in counterpoint and reference to grey infrastructure, implying the complex system of multiple benefits which are considered in its planning and design (green infrastructure has also been appropriated for multiple purposes, from porous paving to regional frameworks). Finally, wildlife corridors serve wildlife movement, as scenic corridors protect scenery and trail corridors protect recreation, and riparian buffers protect water quality.

Ahern (1995) also compares ten partially overlapping terms, and their different usages in Europe and North America (1995, p.133). A key term in use in Europe but largely absent from our vocabulary is ecological networks, defined as any system which serves an ecological purpose. Ahern notes that among many similar terms, the usage of greenways stands apart for implying corridors which serve multiple purposes.

Greenways literature

The author found no text to be exhaustive in its coverage of all aspects of greenways, including its range of planning scales reviewed, scope of built works described, balance of ecological and human factors discussed, and lessons for designers and planners. The three most useful books found for understanding the concepts and practicalities of greenway planning in North America were those by Hellmund and Smith (2006), Erickson (2006), and Flink's and Searns' (1993).

Hellmund and Smith (2006) are the principal authors of *Designing Greenways: Sustainable Landscapes for Nature and People*. They also edit chapters on wildlife, water, and urban greenway planning, which are bookended with overviews of related planning concepts and of design and planning principles. The book often provides enough detail to act as a primer for professionals unfamiliar with ecological factors of greenway design and planning. But the authors' suggested methodology is not comprehensive enough to convince other planners (Laurian 2008, Ndubisi 1995), especially because it lacks sufficient case studies to back up its recommendations (probably because the original edition was written in 1993 and has not been sufficiently updated).

Erickson's (2006) book *MetroGreen: Connecting Open Space in North American Cities*, however, has another decade of hindsight from which to learn. Interviews, site visits, and her own spatial analysis inform ten principal case studies in the United States and Canada. By organizing her case studies by the main goals accomplished through their planning efforts (ecology, recreation, transportation, community, and green infrastructure), she juxtaposes and compares sites which share a goal. Her thorough research allows her to simultaneously see the multiple roles our open spaces play, and to see how landscape ecology can act as both an evaluative tool and a form-generating tool available, as Kara A. Whittaker (2008) emphasizes.

The book that designers and planners are mostly likely to use as a reference during project management is probably still Flink's and Searns' (1993) Greenways: a *Guide to Planning, Design, and Development*, written in 1993. Full of references to case studies, the authors cover planning processes, laws, funding sources, and types of managing agencies.

In 1995, the journal *Landscape and Urban Planning* asked Julius Fábos and Jack Ahern of the University of Massachusetts, Amherst, to compile a special issue to address the nascent greenway movement and literature[1]. This issue both reviewed the existing literature and expanded it greatly. The three sections covered an introduction to the greenway movement; planning aspects; and perception and implementation. Most authors were from the United States, but it also included several European contributors. As could be expected with so many contributors, there is some inconsistency in style and quality, but overall this compilation provides diverse expertise and opinion, from several nations, on a wide range of topics from ecological research to politics. Many of the articles are still relevant today.

Nine years later, Fábos (2004) provided an updated succinct overview of the academic literature on greenways. The main conclusion was that despite an explosion of greenway projects during this time period, few useful pieces had significant influence on greenway development on a national or international scope. Fábos (2004) found that one impediment to academic publication of these case studies was the literature's shortcomings of academic elements, including literature reviews and descriptions of study methodologies, while those practical lessons and analyses which were published with a wide geographical distribution were placed in journals too academic to reach those practitioners who would benefit most from their publication.

1 The issue has been compiled into book format; see Fábos, Julius Gy, and Jack Ahern 1996.

Among others, Fábos (2004) credits Little's (1990) popular press book, *Greenways for America* as doing more than any other publication for popularizing the citizen-led planning efforts and multiple benefits of greenways. Little traveled widely and interviewed dozens of planners and activists to write this readable book. But although he includes a bibliography, he rarely cites any of them, and few references are refereed works.

Fábos (2004) was writing before publication of Erickson's 2006 *MetroGreen*, Hellmund and Smith's (2006) *Designing Greenways: Sustainable Landscapes for Nature and People*, or Girling and Kellett's (2005) *Skinny Streets and Green Neighborhoods: Design for Environment and Community*, all books full of case studies and practical advice.

Menze (2005) differentiates between literature on greenway planning, greenway implementation, and land use ethics. She then further dissects planning literature into that of the 1990's, which she calls "optimistic" (p.9) and literature after 2000, which she found to be more "critically questioning" of the assumption that greenways can serve multiple purposes equally well. For example, Ahern (2004) casts his critical eye upon habitat planning, reminding us that "few species' spatial and habitat requirements are sufficiently well understood to be represented and modeled in a spatially explicit manner in greenway planning" (Ahern 2004, p.46). Von Haaren and Reich (2006) note that "objectives of species conservation often cannot be optimized when other interests...require too many compromises" (2004, p.11), which is perhaps an understatement.

Within the implementation literature, one theme which Menze (2005) identifies is debate about the most effective scale of greenway planning. The landscape ecology work which has inspired the greenway movement consistently analyzes sites at a coarse scale in order to gain systemic understandings not available at any other scale (Forman 1995). Yet much of the motivation for implementation derives from grassroots, participatory planning efforts which can often act quicker and more efficiently than can larger agencies and can form the antithesis to top-down regional planning (Erickson 2004a; Menze 2005). Even when experts weigh in, a cultural difference of opinion remains. Perhaps due to her European background, von Haaren (2004) places priority upon the quality of the long-term habitat created. Erickson (2004), however, observes that local governments in North America can often make incremental progress where regional governments can not: "Although some problems are best served by large metropolitan governments, most problems are best scaled at more local levels" (2004a, p.201)

The final lesson Menze (2005) draws from the literature may seem obvious in hindsight, but is often helpful to highlight: poor public participation processes result in poor public participation (2005, p.26).

Girling and Kellettt's *Skinny Streets and Green Neighborhoods: Design for Environment and Community* (2005) shows what works at the neighborhood scale. Several comparisons are made between "grey" and "green" city infrastructures, at multiple scales. But the book does not differentiate the proven effective roles of citizens and policy-makers in effecting change. Descriptions of case studies are grouped together, rather than showing how practical lessons gleaned from these histories apply to theoretical concepts. The case studies fall into a narrow socioeconomic range, limiting the book's applicability.

History

Searns (1995) identifies three generations of greenways, from pre 1700's efforts to those of 1995. Early greenway planning, in Searns' (1995) scheme, includes everything up to 1960, when modern planning principles underwent large shifts. Olmsted's Emerald Necklace in Boston would make a classic example of early greenway planning. The second generation covers the period between 1960 and 1985, during which the popularity of greenways resulted both as a backlash against rapid post-war expansion and in support of a nascent movement encouraging outdoor recreation. During this era, Wisconsin led by example with a one percent gas tax to pay for large planning and preservation efforts advocated for by landscape architect Phil Lewis (Grove 1990). Fábos (2004) also divides our history of greenway planning into four phases, ending the first phase with the work of Frederick Law Olmsted and Charles Eliot, and the second with that of Olmsted's sons and Eliot's nephew, the early to mid-twentieth century. Fábos' (2004) third phase matches Searns' (1995) second phase. Fábos (2004) identifies these first three phases as the evolution of greenway planning, whereas the fourth "phase," analyzed later in his article, was formed by the more recent practices of the 1980's and 1990's. In his analysis, Fábos (2004) points out that the first three phases of greenway planning were practiced and implemented mostly by landscape architects, whereas the adoption of greenway planning has expanded to planning disciplines, among others, and to active grassroots citizens' groups. Landscape architects should take heart that good ideas and a well-grounded design process have given rise to their inter-disciplinary popularity.

The popularity of planning greenways in Canada and the United States rose after the great suburban building booms of the 1950's and 1960's (Little 1990). This timeline suggests that a majority of the most popular and beneficial greenway projects are efforts at reclaiming access to developed sites. Compared to planning efforts which set aside greenway corridors as part of planned developments, these reclamation efforts—even when successful—are exponentially more complex, involving many factors that substantially increase costs, require longer planning periods, involve more stakeholders, and cause more political conflicts (Erickson 2006, Menze 2005). Nearly all significant greenway construction in North America

today can be considered reclamation of one sort or another (Erickson 2006, Girling and Kellett 2005). Thus, this complicated process becomes more important than those of planned developments in our understanding of greenway planning efforts, and should be the subject of our attention.

Even greenway planning that does not involve reclamation is a more involved effort today than it would have been fifty years ago due to the combination of our current set of land use ethics (Menze 2005), our understanding of landscape ecology, and our advanced capabilities to perform comprehensive analysis. Modern project planning normally involves multiple broad infrastructure objectives, such as the provision of flood control, the protection of wildlife habitat, and the improvement of ground water quality. Additionally, planning today encounters environmental regulations at several levels of government.

The 1985 President's Commission on Americans Outdoors noted that "greenways...have the potential to be this country's most important land-based effort for conservation and recreation in the next several decades" (1987, cited in Erickson 2006 n.p.). Yet little mention is made in the existing literature of the federal role in promoting and funding regional and inter-state greenway networks. An overview of New York City's greenway plans notes instances in which the federal government has promoted their use nationwide:

> The Intermodal Surface Transportation and Efficiency Act (ISTEA) of 1991 established a federal transportation policy that promoted non-motorized modes of transportation such as walking and cycling. This policy was re-emphasized in the 1998 Transportation Equity Act for the 21st Century (TEA–21) and in the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETA–LU) authorized in August 2005." (New York City Department of Parks and Recreation 2011., n.p.)

The federal government has funded, or partially funded, many greenway projects, but it is not clear if one federal department or program is coordinating federal efforts, or is even aware of how federal dollars are being used in this regard. Just as the federal government has shaped grand visions of an interstate railroad system, an interstate canal system, and an interstate highway system, it has the opportunity to make a similar impact for the future of the nation's ecological systems and public health (Grove 1990).

The greenway concept's resurgence since the mid 1990's has come simultaneously from several sources: academia; grassroots community efforts; and governments of all levels, from city councils to the President's Commission on Americans Outdoors (1987). Just as greenways provide benefits of all scales to multiple user groups, their implementation can come from parties of all sizes.

Planning considerations

Half of the world and 82% of Americans now live in cities and suburbs, according to the CIA World Factbook, and the numbers for each are rising (US CIA 2010; US DOT 2011). As more people live in cities, and as those cities grow in population and acreage, the design of greenways become more important for multiple reasons. The design of cities will have an increasing effect on our social health and our surrounding ecological health; the need and demand for open space will increase; and the cost and value of both existing and potential urban open space will increase.

The gradual adoption of principles of *new urbanism* and *smart growth* show that the concept of greenway development will likely have an increasingly receptive audience in North America, where compact development has risen dramatically (Girling and Kellett 2005). One estimate from 2005 claimed an annual increase in new urbanist projects of between 28 and 37 percent (Steuteville 2004, cited in Girling and Kellett 2005). One planner claims that "Portland is winning the war on urban sprawl at the neighborhood scale, or at least appears to have won some important battles, but progress remains elusive at the regional scale" (Girling and Kellett 2005, p.137).

Erickson (2006) identifies four types of context to consider for any potential project. The political context includes the multiple involved agencies, and their levels of government, relative power, and overlapping responsibilities. It also might include environmental regulation and precedents for such a project. The cultural context involves the age, density, ethnicity, and diversity of a region. The natural context includes site topography, hydrology, vegetation, wildlife, and regulations. And the economic context involves land use, zoning, density, key industries, tax revenue, and socioeconomic class.

Little (1990) identifies four roles which one or more agencies must play, be they public or private agencies: site planning; corridor acquisition and development; funding; and operation and maintenance. Note that such roles may be played all by one entity, or with separate entities—or multiple entities—in charge of each role. Also note that these are not necessarily chronological phases, and that they can represent activities which happen simultaneously.

Much of the debate in the literature contrasts local governments and regional governments in their abilities and success at greenways planning, development and operation. As mentioned earlier, Europe may have seen more implementation success from a top-down planning approach than North America has (von Haaren and Reich 2006; Erickson 2006). But there are also precedents (Little 1990) for two other types of agencies managing greenway creation: non-profit organizations; and public-private partnerships formed specifically to manage greenway projects, especially foundations.

Discussions of the relative merits, advantages, and potential success of agencies should focus on which agency or type of agency might be the most appropriate for each role (Little 1990). For example, at a regional scale, private groups can not handle ownership and project management, though they can participate in planning, fund-raising, and maintenance. Private entities face fewer regulations in matters such as acquiring parcels and drafting legal agreements with landowners, and thus are able to operate on shorter timelines. Management structures of private entities may also allow for rapid, unilateral decision-making (Little 1990).

Little (1990) claims that evidence suggest semi-independent public agencies and foundations may not have the conflicts of interest that public works, transportation, or parks departments might have in balancing the multiple objectives of greenways, objectives including access, recreation, safety, water quality, and habitat creation (p.181). Foundations may have full authority over a given project, unlike private entities, and full jurisdiction, unlike local governments. If set up carefully, a foundation can also ride out political eras unharmed by changes in leadership (Little 1990).

Although the acreage of any given project may not be very large, linear projects can traverse many land use zones and socioeconomic neighborhoods. While this diversity ultimately may create a corridor which serves many types of user groups, this diversity can also complicate the political aspect of the planning process. Due to their linear nature, greenways with public access usually must dedicate a greater percentage of their acreage to human use areas than do non-linear ecological areas (Mertes and Hall 1995).

Four of the most common ecological aspects of greenways are their potential benefits on air pollution, water quality, flood control, and wildlife. While the collective knowledge and experience of planners regarding habitat creation is still not very well developed, we are starting to understand key considerations, such as the minimum acreage of habitat necessary for survival of each species, and the threat of genetic isolation to wildlife diversity and population strength. Wildlife benefit from both having a large sanctuary acreage, and from having landscape linkages (Forman 1995). It is often impossible to place a relative value on the potential importance of each landscape to an individual species. Corridor creation has come to be seen as a potentially less expensive boon to local wildlife populations, and an accomplishment that can be achieved in developed areas within less than a generation (Grove 1990).

Design Considerations

Due to the urban nature of most projects today, key factors in the identification of potential sites are the availability of land, the location of existing and planned parks and open spaces, and the density of residential neighborhoods (Mertes and Hall 1995). Corridors along natural features are much more preferable not only for ecosystematic benefits, but also for recreational purposes (Hellmund and Smith 2006, Ahern 1995, Mertes and Hall 1995). Planners identify opportunities for developing greenways along natural features by examining the waterways, ridges, ravines, and valleys of a region. When these sites are not feasible, planners may look to develop along man-made corridors, such as canals, railroad rights-of-way, pipeline rights-of-way, power line rights-of-way, and parkways (Mertes and Hall 1995, Little 1990). Another common scenario is to integrate greenways into the planning of subdivisions and the redevelopment of former industrial sites.

Familiarity with the site from ground-truthing experience is just as important for regional planning as it is for site-scale design (Little 1990, p. 180). Experience on site can aid greenway designers and planners to have an updated, granular, and vivid understanding of issues including but not limited to sightlines, noise, air quality, drainage, invasive vegetation, maintenance, micro-climate, scale, and population density.

In identifying the types of users who are advocating for open space, the designer should also consider potential user groups that might be created or organized by any new space. Key users of greenways include walkers, dog-walkers, joggers, cyclists, skaters, skiers, equestrians, swimmers, canoe/kayak, picnickers (Mertes and Hall 1995). At the planning scale, the function of a greenway may be as straightforward as to link components of multiple parks into one park system. For a designer, the implied program of such a function usually means recreation, and the permitting of uninterrupted safe pedestrian movement between neighborhoods. This is to be done while integrating with the natural context as much as possible.

Adjacent homeowners of newly developed greenways have not noticed a noticeable increase in crime (Grove 1990). Conversely, anecdotal evidence from park managers suggests that crime and nuisances tend to be related to areas with vehicular access (Grove 1990).

Conclusion

Successful greenway planning efforts allow greenways to connect not only non-linear open spaces, but also locally significant sites of ecological or cultural value. Linear open spaces of all scales have been considered greenways, from a daylighted urban creek that connects neighborhoods to interstate trails along former railroad right-of-ways. Recreational and ecological values are both increased exponentially when they are planned and built as part of a regional system or network (Hellmund and Smith 2006, Erickson 2006).

While a particular greenway may seem to be a logical and natural part of its surrounding context, their creation is never by accident, and often results only from the continued dedication and collaboration of citizens, policy-makers, and several regional agencies. Potential recreational value has made the concept popular with citizens' groups since the early 1970's. The planning field

has supported the effort due to their recreational and ecological values as well as for their non-vehicular connectivity and the sense of social and political connection they provide to citizens, particularly the young and elderly and others without vehicular access.

Due to the nascent state of greenway planning as a practice and academic discipline, planners and designers today must consult the rapidly expanding academic literature while simultaneously making efforts to gain access to first-hand knowledge of related projects, be they local or international. As we develop our understandings both of complex regional ecologies and of effective short-term and long-term implementation practices, we can learn from both local and international examples of how to set and balance goals, when to attempt to balance those goals, and how to balance top-down and bottom-up efforts.

CAPILLARY ACTION: HUMAN RECREATION IN URBAN-RESIDENTIAL ALLEYS

Meagan Yellott

INTRODUCTION

The Los Angeles landscape suffers from park poverty and access to open spaces, leaving small urban spaces as increasingly important resources for urban communities. Pocket parks, parklets, green streets and alleys are incorporated in city planning efforts focused on improving green infrastructures and open space distribution. As our understanding of the urban environment continues to expand within an ecosystematic framework, we also expand our understanding of the complex interactions between urban systems, environmental health and human well-being (Akers, Muhammad, Corbie-Smith 2011; Wolch 2011; Dahmann, Wolch, Joassart-Marcelli, Reynolds & Jarrett 2010; Alberti, Marzluff, Schulenberger, Bradley, Ryan & Zumbrunnen 2003).

Urban-residential alleys are typically found in older neighborhoods in American cities and were designed as service routes for home and municipal maintenance (Martin 2002). Now, though many have fallen into disrepair since their original development, urban alleys are "being reconceptualized as sites with the potential to support alternative modes of transportation, increase physical activity levels, facilitate neighborhood social life, manage urban runoff, and recharge groundwater" (Seymour, Wolch, Reynolds & Bradbury 2010, p. 380). The City of Los Angeles boasts more than 12,000 alley segments that add up to over 900 linear miles (Bureau of Sanitation 2009). The following essay is a review of existing literature that explores how these "dorsal landscapes" (Martin 1996) may be designed to provide multiple benefits for the community and environment. The discussion begins with background on the existing conditions as well as perceptions of the built environment and public health in the urban context, followed by an inventory of current knowledge on recreational activities and influences. The essay concludes with an examination of opportunities for infrastructure changes that support multiple benefits, from urban runoff mitigation to safe recreation opportunities, as well as discussion of the obstacles to this rehabilitation.

BACKGROUND

Urban Context

Built Environment

If cities are human-dominated ecosystems then human behaviors, activities and impacts are natural processes within the system. We have come to understand that a city's resilience depends on its ability to maintain both human and ecosystem functions (Alberti Et al 2003). Los Angeles has approximately 6,500 miles of paved streets, 10,000 miles of sidewalk, 900 linear miles of alleys, and 34,000 catch basins (Bureau of Sanitation 2009). This infrastructure is riddled with complexities of distribution with far-reaching implications and influences. The relationships between infrastructure and both environmental and public health are continuously under investigation.

To understand the ecosystematic role of small urban spaces like alleys, the concepts of function, waste and emptiness are especially informative. Martin (1996) explains "the literal and figurative foundation, the sine qua non of the alley is its service access function" (Martin 1996, p. 138). Alley function is intrinsically related to waste. Engler (1997) identifies eight distinct periods of American history that frame the kitchen and bathroom as main sites of waste production with the yard, street and alley serving as storage, processing and transaction places for this waste. As early as the 1700s, alley function for residents of American cities has been related to household maintenance, "waste is put at the boundary, the marginal space, for further removal or transaction" (Engler 1997, p.61). However, many alleys in Los Angeles today are poorly drained, poorly lit, overgrown, and covered in degraded and uneven paving which renders their functionality mute and even makes them a target for illegal dumping (Seymour, Wolch, Reynolds & Bradbury 2010). As a result, many have been abandoned and vacated, no longer perceived as useable places. They are often fenced off to useful destinations and exist as backwater zones used by potential trespassers or 'strangers', rather than by residents seeking active transportation and recreation.

Corbin (2003) illustrates several reasons why emptiness or vacancy in the urban landscape is compelling. First, the ordinary and familiarity of these abandoned places renders them, to an extent, invisible (Corbin 2003). That is to say that empty places occur with great regularity in the urban landscape and residents encounter them with such frequency that they are overlooked (Corbin 2003). However, this dynamic also engenders a kind of revelatory nature to these spaces as they may contain clues to cultural tendencies or habits we engage in when, or where, we think no one is looking. Also, in light of our current discourse on infill and sustainable development, vacancy is coming to be viewed in contemporary planning and design as a potential resource and that abandoned or unused spaces raise issues of perception, use and design (Corbin 2003).

Public Health

In terms of public health indicators, research is focused on sedentary lifestyles and physical activity levels which contribute to rates of obesity, diabetes and heart disease (King, Sallis, Frank, Saelens, Cain, Conway, Chapman, Ahn & Kerr 2011; De Jesus, Puleo, Shelton & Emmons 2010; Hillier 2008). Additionally, park poverty and income poverty are frequently listed as demographic influences on health (Dahman, Wolch, Joassart-Marcelli, Reynolds & Jarrett 2010). Indeed, the multitude of factors that influence public health and physical activity in the urban landscape is still expanding and further discussion of these intricacies will follow. "Ultimately, we must view the geography of outdoor recreation in an urban area as being a reflection of the local resource base" (Williams 1995, p.25). Recreation

opportunities should be kept in mutual conversation with form and function (like runoff and stormwater capture) if we are to continue working towards an ecosystematic understanding of the urban condition.

INVENTORY

Research shows that alleys and other small urban spaces must be analyzed for both physical and social characteristics. Physically, these spaces must maintain or improve utility and function for municipal purposes as well as improve conditions for recreational or leisure use. Socially, these places must support and serve the needs of the community with sensitivity towards the specific demographic contours of the residents both now and in the future.

Physical Activity

Van Loon & Frank (2011) characterize physical activity behavior and draw distinctions between routine activity and active transportation, like walking to school each day or playing organized sports, and independent or unstructured play that occurs spontaneously throughout the day in different settings. These types of activity are further characterized by volume, intensity and duration and there are marked benefits to both. Additionally, social recreation can take place in the urban setting and brings multiple benefits to public health and neighborhood safety.

Reputation or previous experience, gender, age, race/ethnicity, sexual orientation, physical or mental disabilities, and socioeconomic status all contribute and shape user experience and perception of the urban outdoors (Loukaitou-Sideris 2006). These variables, along with urban form, affect user's feelings of fear and safety. Different sources of fear result in different safety concerns, which, in turn, impact outdoor activities differently. Loukaitou-Sideris (2006) makes a distinction between the perceived risks of human and non-human or environmental factors. For example, the presence of strangers may lead to a perceived fear of crime or violence while poorly maintained or damaged sidewalks may solicit a fear of injury from tripping or falling (Loukaitou-Sideris 2006). Sociopsychological, sociodemographic and environmental factors further qualify and describe these perceived risks and fears of the urban environment.

Routine Activities

A study designed to observe the relationships between income levels, walkability of neighborhoods and physical activity levels and body mass index (BMI) in older adults was conducted in Seattle-King County, WA and Baltimore-Washington, DC neighborhoods (King, Sallis, Frank, Saelens, Cain, Conway, Chapman, Ahn, & Kerr 2011). A survey measured reported physical activity, accelerometer measured physical activity, body mass index (BMI), and demographic covariates[1]. The focus of the walkability index used in this study was destination based and concentrated on utilitarian trips versus recreational or leisure trips (King et al 2011).

Residents in walkable neighborhoods reported more walking to nearby destinations than residents in less walkable neighborhoods. This finding remained true regardless of neighborhood income levels and suggests that improved pedestrian infrastructure can benefit residents across the income spectrum. Increased activity is linked to lower BMI which has significant health implications for older adults. Walkable neighborhoods that support active transport to varied destinations, particularly healthful food outlets, are demonstrated to have a positive effect on BMI in older adults (King et al 2011).

Wesely & Gaarder (2004) specifically detail women's experiences and reactions to the urban outdoors. Traditionally discouraged from participating in sport in the public realm, women typically encounter many contradictions as they engage in outdoor recreational activities (Wesely & Gaarder 2004). Their study utilized a survey that combined both single-item measures and open-ended questions in addition to in-depth interviews with female users of South Mountain Park in Phoenix, AZ. The survey was designed to capture descriptions of women's recreational experiences and strategies they use to cope with feelings of vulnerability and fear while the interviews allowed for more detail about the ongoing negotiations women face about their behavioral choices in the outdoor environment (Wesely & Gaarder 2004). The findings were somewhat discouraging as the authors concluded that it is impossible to completely eliminate the threat of violence in the urban outdoors (Wesely & Gaarder 2004). Additionally, they discovered that women tend to self-police which further limits their opportunities for recreation. However, respondents noted that emergency phones or call boxes, better lighting, clearly marked trails, and regular patrols would improve their feelings of safety (Wesely & Gaarder 2004). These design suggestions may also apply to small urban spaces. On the social level, the study showed that organized women's groups for running, walking, and biking may help to foster a sense of legitimacy, camaraderie and ownership for women that may increase frequency, diversity and safety of users (Wesely & Gaarder 2004).

Using an established typology[2] for

1 Here, demographic covariates include: age, gender, educational attainment, race/ethnicity, number of motor vehicles/adults in household, marital status, number of people in household, and years at current address.

2 The authors suggest, based on Madriz (1997), that women tend to follow gendered rules of behavior as they may be held socially responsible for their own victimization for not knowing better (Wesely & Gaarder 2004, p.657).

Andrews & Gatersleben borrow and build from Fisher & Nasar's typology in which prospect is understood to be visual and physical access (or escape) within a space while refuge is understood as the sheltered or hidden areas.

Perceived danger is described as "a cognitive appraisal danger," (Andrews & Gatersleben 2010 p.474) which is distinctly different to fear or "an emotional reaction towards a stimulus or event" (Andrews & Gatersleben 2010 p.474). This distinction is important because perceived danger does not always engender fear. For example, the perceived danger involved with the physical and psychological challenge of cliff diving may also

levels of prospect and refuge, Andrews and Gatersleben (2010) simulated three different walks with either low, medium, or high levels of prospect-refuge (Andrews & Gatersleben 2010). The study was designed to measure perceived danger and fear in a wilderness landscape. The sample population consisted of students and alumni of a British University solicited through a broadcast email containing a link to the survey on the school's social networking intranet website. Each respondent was randomly assigned to one of the three simulated walks communicated online through a series of photographs accompanied by a questionnaire (Andrews & Gatersleben 2010). Perceived danger was measured by response to three queries: likelihood of coming to harm, severity of perceived threat, and anticipated level of control over perceived dangers (Andrews & Gatersleben 2010). Specificity was further delineated in terms of social danger, physical danger, lost danger, fear, and preference (Andrews & Gatersleben 2010).

Significant differences were found between the three levels of prospect-refuge conditions in relation to both perceived danger and fear (Andrews & Gatersleben 2010). As prospect increased and refuge decreased, levels of preference increased while perceived danger and fear decreased. However, levels of perceived social danger did not differ significantly between the three levels.

result in an emotional reaction of excitement, accomplishment and ultimately self-satisfaction or self-esteem.

This study made important distinctions between types of perceived danger and fear that can inform strategies to improve recreation opportunities. Additionally, although this study was focused on the wild park setting, the findings can be used to influence the design of urban spaces in ways that elevate feelings of safety. For example, well-lit, clear view corridors provide users with sightlines toward future escape in the event that they feel threatened or vulnerable.

In a specific exploration of low-income areas in Los Angeles, Seymour, Wolch, Reynolds & Bradbury (2010) studied residents' perceptions of residential urban alleys in terms of danger and desires for future greening efforts. The sample population for this 2007 study consisted of five focus groups containing both men and women located in Hollywood, Pacoima, South Los Angeles, Sun Valley, and Wilmington. The critical issues considered in determining focus group locations included high concentrations of alleys, park poverty, flooding problems, safety concerns and trouble with trash pollution (Seymour et al, 2010). Each discussion was translated and/or transcribed and a brief survey was given at the conclusion of each focus group. The data was then coded and analyzed several times to determine relevant and specific recurring themes (Seymour et al, 2010).

Overwhelmingly, fear of danger or perceived danger was found to have a large impact on attitudes and reported behaviors in each neighborhood (Seymour et al, 2010). Residents related they would actively avoid alleys, especially when alone or at night, and forbid their children from playing in the alleys (Seymour et al 2010, p.385). Participants also expressed a fear of violence or retaliation that prevented them from reporting suspicious or criminal activities (Seymour et al 2010, p.386). Despite these apprehensions, residents described taking action in other ways like calling the Fire Department or Bureau of Sanitation and even organizing their own neighborhood efforts to address trash and graffiti (Seymour et al 2010, p.386) which demonstrates an established and practiced willingness to participate in physical maintenance of the alleys.

Active transportation or routine activity can increase the frequency of active behavior for the individual, which can have health benefits that extend into the community (van Loon & Frank 2011). But, citing a 2003 study by the National Highway Traffic Safety Administration, Loukaitou-Sideris (2006) suggests that major changes in modes of transportation will not happen by encouraging walking and bicycling within the neighborhood scale. Circulation networks for non-auto users must also connect with popular destinations within the larger city. Applying those findings to the current discussion, if alleys are to be repurposed and repopulated by pedestrians and other users, they should be conjoined in ways that lead to destinations that neighbors want to visit. Users should be able to access schools, churches, shops or other everyday destinations freely from these pathways without gates or fences blocking them, otherwise alleys are not likely to be alternatives to auto transportation.

Coordinated Or Social Recreation

De Jesus, Puleo, Shelton, & Emmons (2010) have examined the relationships between perceived neighborhood safety, social networks, social support, and social cohesion in Boston, MA. Their study sought to investigate associated health impacts associated with the social environment. The interviewer-administered survey was offered in either English or Spanish with a twenty-five dollar compensation for participating (De Jesus et al 2010) with a sample population in 12 public housing communities in low-income Boston. *Social networks* were measured in terms of: marital status, sociability, church group membership, and membership in other community organizations (Berkman and Syme, 1979 in De Jesus et al. 2010). *Social support* was measured in terms of emotional, instrumental and financial support behaviors (Barrera et al. 1981 in De Jesus et al. 2010). *Social cohesion* was measured by perceptions of trust and shared values within the neighborhood (Sampson et al. 1997 in De Jesus et al. 2010). To measure "perceived neighborhood safety," participants were asked to describe, for both daytime and night-time, how safe they feel walking alone in their neighborhood (De Jesus et al. 2010, p.1009).

Residents reporting higher levels of social cohesion were found to have elevated levels in perceived neighborhood safety which has potential positive implications for health and well-being (De Jesus et al. 2010). Additionally, men who described smaller social networks were more likely

to feel safe than those with larger social networks, which the authors contribute to a potential connection between larger social networks and negative influences or interpersonal interactions (De Jesus et al. 2010, p. 1011). Women with lower levels of income, education, and employment showed the lowest levels of perceived safety and the authors suggest that future public policy and health initiatives "need to first address female residents who are less well-educated, not born in the US, and whose first language is not English" (De Jesus et al. 2010, p.1011).

This study suggests that efforts to understand, address and improve social cohesion in low-income neighborhoods will aid in elevating levels of perceived safety among residents and therefore create a more neutral environment for outdoor recreation. It is also informative in terms of the potential efficacy of implementing different outreach and policy strategies for different genders and that a larger social network does not always contribute positively to social cohesion.

Adding to the dialogue on social dynamics, Martin (1996) discusses different typologies of residential alleys and illustrates the need for balance between three "aspects of alleyness" through a comparison of three case studies of residential alley types in the United States: Ladd's Addition in Portland, OR; Cameo Place in Laguna West, CA; and Victorian Harbor in Suisun City, CA. Though today alleys serve mostly as visual relief from a neighborhood's unsightly activities (Martin 1996, p.140), Martin argues that alley character is related to the "degree of enclosure" and that a "true alley will include… utility, hiddenness, and revealingness" (Martin 1996, p.138). He further suggests that visual connections between yards and alleys improve the balance in "alleyness" and create opportunities for community members to act as both spectators and participants which enriches the alley as both a social space and an open-space in the neighborhood (Martin 1996, p. 143). Martin's description of recreation types observed at Ladd's Addition offers a glimpse at a residential alley network that supports and serves the needs of the community. Neighborhood adults engage in chatting, strolling and walking; teens play basketball and skateboard and children bicycle and engage in other unstructured forms of play.

Owens (2002) describes the relationship between adolescent development and the built environment. She explains that teenagers and adolescents need public places to interact with their peers, recreational opportunities, escape and solitude (Owens 2002). Although adolescents are legitimate users of the public landscape, policy and design measures are often aimed at limiting or prohibiting teenagers from gathering in public spaces. For example, curfews are often used as a restrictive policy to control teen access to public spaces in favor of protecting private interests. However, these measures are strongly opposed by the American Civil Liberties Union as a violation of individual rights (Owens 2002).

Unstructured Activity And Children's Play

Independent play allows children to experiment, discover and interact with their environment on their own terms, which supports development and individual confidence (van Loon & Frank 2011). Moore (1989) discusses children's needs, provides a summary and description of the state of public playgrounds in the United States in 1989 and outlines directions for future policies that will improve and support playgrounds as viable places for child development (Moore 1989). He offers a description of Beasley's (1974) play setting studies and behavior comparisons between children using *traditional*, *contemporary* and *adventure*[3] playgrounds (Moore 1989). The study revealed that adventure playgrounds, versus traditional or pre-determined play structures, more effectively support a better diversity of developmental needs.

The evidence discussed by Moore (1989) suggests that small urban spaces, with proper safety infrastructure, may be suitable for adventure playground opportunities, that more appropriately meet childhood development objectives.

Moreover, integration of these types of opportunities can work to build community engagement. The need to meander, play and interact with the environment unsupervised conflicts with auto-specific transportation systems because children, pedestrians and bicyclists are at risk of collision with motorists. Alleyways could be a more pedestrian-friendly alternative as they tend to have lower volumes of traffic moving at already slower speeds.

However, television is the most pervasive technology in children's lives. The Internet has also created a sea change in the childhood experience, setting this generation apart from the last (Hillier 2008). Advertising targeting children in many available media largely promotes food products (Hillier 2008). As technology continues to become more portable, children's non-screen time[4] is shortened while their exposure to advertisements for unhealthy foods increases. These dynamics precipitate to lower levels of physical activity and higher levels of childhood overweight (Hillier 2008).

Despite the overwhelming negative influence, Hillier (2008) argues that technology is also helping to improve the health of children in urban environments. GIS and GPS technologies are used regularly as research and planning tools that serve to more accurately represent the environment and the interrelated dynamics effecting activity and behavior.

3 The traditional type is a "typical schoolyard play equipment area with swings, slide, jungle gym, etc;" the contemporary type is "professionally designed, supposedly with children's needs in mind;" and the adventure type is an area with no adult-provided permanent play structures, but instead loose materials and simple tools for children to build their own play settings" (Moore 1989, p.90).

4 Time spent away from a television, computer, cell-phone, or other type of display screen.

DISCUSSION

Rehabilitating Infrastructures

The literature also presents complexity in the discussion of possible changes to the alleys and infrastructures. Wolch (2011) calls for a deeper and more considerate exploration of the ecosystematic connections between urban theory and public health. Urban regimes, with both physical and policy effects, must respond more adequately to the complex living contours of neighborhood demographics and behaviors. The Master Plan needs to update its own infrastructure.

The ambiguous or liminal nature of alleys creates a challenge for designers and planners to make physical improvements that will strike a balance between the rights of the public and the needs of affected residents (Seymour et al 2010, p.390). In terms of urban outdoor recreation, Seymour et al. (2010) illuminate a shared desire for alley amenities throughout Los Angeles. However, there is also a deeper affliction in these communities: a shared fear of using the alleys because they are currently seen as dangerous hiding places for potential crime or violent encounters[5].

Built Infrastructures

As previously discussed, preference and/or fear as reactions to the physical environment, stem from both form itself and individual experience or context. The physical arrangement of the place, cues to the care or maintenance of that place, previous knowledge (including constructed reputations), and personal biases all contribute to an individual's perception of their specific surroundings. The intuitive results of the study show that narrow alleys and alleys with more shadows are linked with elevated perceptions of fear or danger while alleys with obvious setting care (orderliness and evidence of surveillance) were linked with higher rates of preference. Mystery and curvature, however, were found to be context dependent, both potentially attractive and disconcerting. These findings are in contrast with earlier studies that posit that sharply curving alleys would be seen as potential hiding places for predators and incite fear reactions. This study found no clear relationships to physical form and call for further study in this area (Herzog & Smith 2001).

Physical improvements in lighting are often related to a perceived increase in safety (Seymour et al 2010; Loukaitou-Sideris 2006; Wesely & Gaarder 2004; Martin 2002). "Images showing benches and play equipment were extremely popular," signaling residents' desires to have recreational amenities in their neighborhoods (Seymour et al 2010, p.386). Difficulties also manifest as tension over control of the private and public aspects of alleys. Residents immediately adjacent to alleys favor controlling access through elements like gates[6] and other forms of surveillance while non-adjacent residents prefer leaving alleys unblocked to maintain shortcuts through the neighborhood (Seymour et al 2010).

Social Infrastructures

Neighborhood-specific information will illuminate opportunities and limitations associated with incorporated alleys and other small urban spaces. For example, mapping the locations and age ranges of schools can contribute to possible design strategies that are age appropriate for potential users. Additionally, inventory and community outreach approaches should incorporate questions that address perceptions of fear and the specific differences, if any, which present based on gender, age and race. Methods like participant-generated photo documentation serve the double purpose of generating data and stimulating community involvement (Hillier 2008).

CONCLUSION

As we continue to study the city as a web of ecological processes, the implications of our activities and infrastructures are also manifesting themselves as new physical realities. The global ecological footprint of cities is often much larger than the geographical terrain they take up (Alberti et al 2003) and we are searching new ways to mitigate our expanding influence. Rehabilitating aging infrastructures like urban-residential alleys can work at the multi-benefit level as an improvement for the multi-level city structure that supports human and environmental health.

5 The wealthy, it is worth noting, often fight the preservation of access ways open to the public, like beach-access roads in Malibu, which could pose a threat to rehabilitating alleys in wealthier areas like Santa Monica and Venice, CA.

6 It is important to note that alley gating is no longer a legal solution as it once was through the City of Los Angeles' Nuisance Alley Abatement Program. The law was deemed unconstitutional by the Supreme Court in 2004.

And so the alley could once again become a special world, not so much a place for the discards and helpless but for a wider range of city dwellers. It offers one of the few urban ... 'retreats,' an enclave just off the busy street, a step away from the hurly-burly. The interior of thousands of city blocks, redesigned and controlled by their residents, offers land that is serviced by utilities and is close to jobs, schools, churches and such reinforcements that city families need.

Clay, 1978