



## Sustainable Neighborhood Assessment

Through the Sustainable Neighborhood Assessment Tool developed by Global Green USA, public officials and local government staff are using the LEED for Neighborhood Development (LEED-ND) rating system to determine ways for future development in their communities to achieve high levels of environmental, economic, and social sustainability. LEED-ND integrates the principles of smart growth, walkable urbanism and green building into the first national rating system for neighborhood design. In Phoenix, Global Green used the tool as a means to evaluate existing conditions and plans for the Eastlake-Garfield District, in order to identify opportunities to augment current revitalization efforts and develop recommendations to increase the neighborhood's overall level of sustainability.

## Assessment Team + Funding

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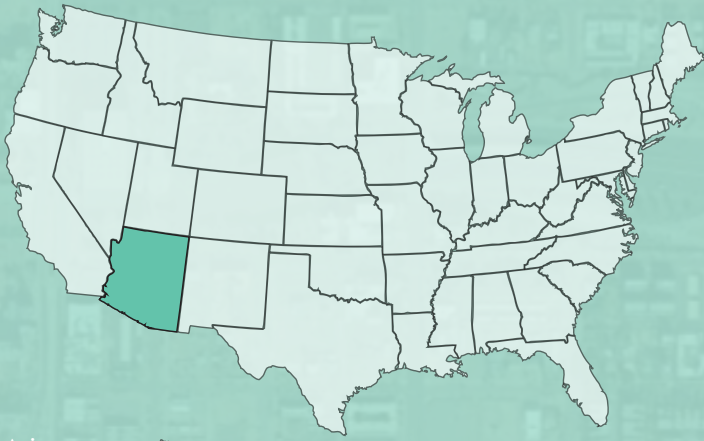
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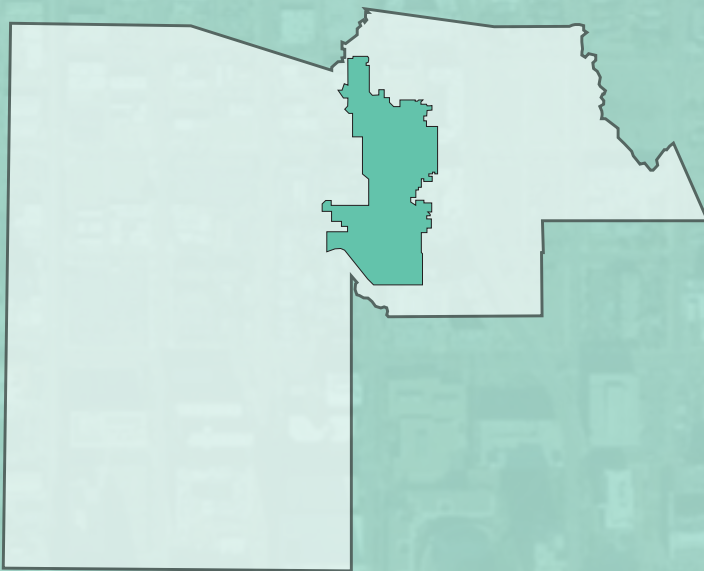
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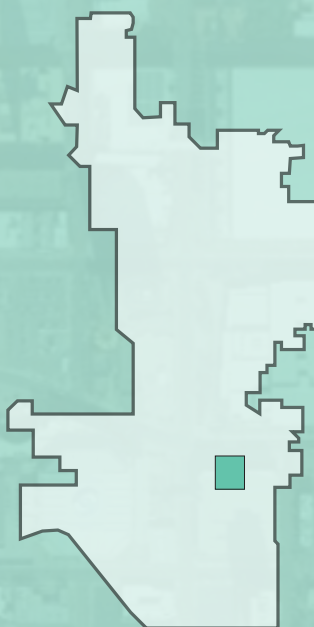




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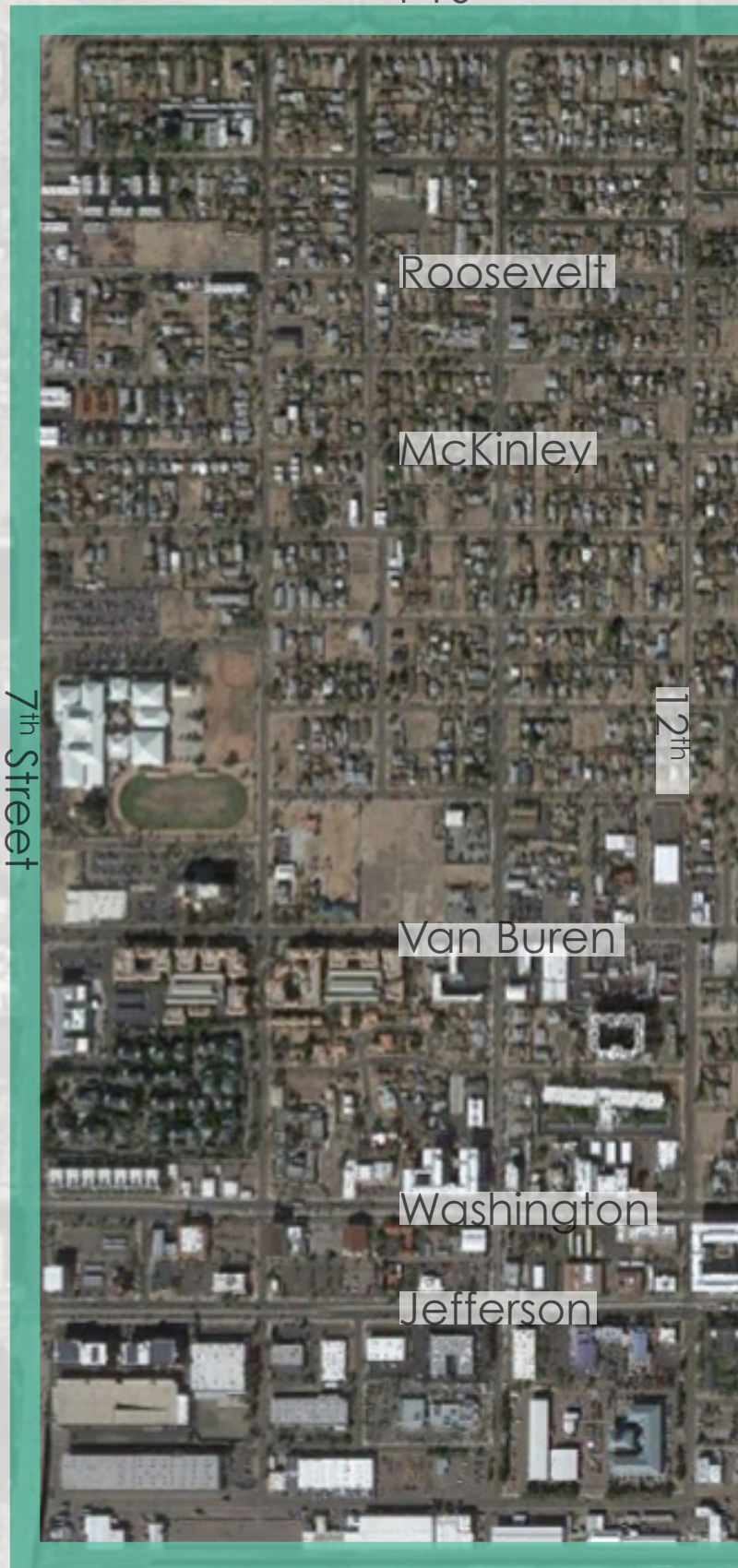


Maricopa County, City of Phoenix



Eastlake-Garfield District

I-10



7th Street

12th

Roosevelt

McKinley

Van Buren

Washington

Jefferson



# Eastlake-Garfield TOD District Study Area



I-10





# Sustainable Neighborhood Assessment Process

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The goal of the Sustainable Neighborhood Assessment process is to identify topical and physical focus areas where policy or planning changes can promote sustainable urban neighborhoods over the short and long term. These interventions can improve the neighborhood's day-to-day sustainability as well as increase its resilience during future weather events and conditions. Some of the defining characteristics of a sustainable neighborhood include focusing development in previously developed areas with high transit connectivity, avoiding building on habitat, agricultural land or wetlands, an urban form that encourages walking and cycling, access to nearby food and services, and energy and water efficiency in both buildings and infrastructure. To define these focus areas, Global Green USA and its team members utilize the Sustainable Neighborhood Assessment Tool, which is based on the LEED for Neighborhood Development (LEED-ND) criteria and checklist.

Prior to visiting the assessment area, the team conducted a review of existing planning documents, code requirements, maps, and stakeholder priorities. An initial assessment was then completed, with the credits in each of the three LEED-ND categories (Smart Location & Linkages, Neighborhood Pattern & Design, and Green Infrastructure & Building) marked as "achieved," "not achieved," "unknown," or "not applicable." Each credit is further ranked for the degree that it correlates to regional or local policy priorities, regulatory support, technical feasibility, market support, and stakeholder input. This analysis is described in more detail beginning on page 18.

This initial assessment serves as the point of departure for the Global Green team's three-day site visit and evaluation. During the visit, the team walks each block of the target neighborhood, photographs examples of positive qualities and areas for improvement, and conducts a series of meetings with targeted stakeholders, City staff, and representatives of relevant public agencies. Throughout the process, the preliminary checklist is edited and refined to incorporate the team's visual observations and contextual issues raised by stakeholders. The initial findings of the evaluation are grouped into broad categories noted on the following pages. The final augmented checklist for the Eastlake-Garfield TOD District (District) can be found on pages 18-21.

The assessment process then enables the team to identify a series of recommendations based on LEED-ND credits to augment and increase the neighborhood's long-term sustainability. Recommendations cover policy, planning, and land use and infrastructure changes which aim to realize a more resilient and sustainable future for the neighborhood. Some recommendations can be implemented fairly quickly, while others will require long-term collaboration among public agencies, local institutions, and private sector partners, as well as multiple sources of funding.



# Neighborhood Assets



1. Strong faith-based community and resources 2. Nearby Valley Metro light rail station 3. Well-established arts programming 4. Active recreation opportunities 5. Public investment in new affordable housing



# Neighborhood Background

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The District, located just east of Downtown Phoenix, is a historically disadvantaged area of the city, hampered by high levels of poverty, acres of potential brownfields, aging infrastructure, and a declining retail and commercial environment. The District is comprised of three neighborhoods: 1) Eastlake Park; 2) Garfield and 3) Edison. The District is home to a diverse community of residents with a demonstrated history of civic engagement, that have been instrumental to recent planning efforts. The District has a high concentration of city-owned public housing, some dating back to the 1940's and 60's. The study area, bound to the north and east by Interstate 10, 7th street to the west, and the Union Pacific Railroad to the south, is entering a new era of investment and revitalization as significant local planning efforts, federal funds, and the introduction of the Valley Metro light rail system coalesce with the potential for meaningful and impactful change.

The housing stock of the District is characterized by a mixture of modest single-family homes, small apartment buildings, and publicly owned multi-family housing structures. Defunct industrial and commercial lots are woven throughout the District, though primarily concentrated along its southern boundary and arterials. With over 80 acres of potential brownfields, large parcels of land held in speculation, and shuttered businesses, an atmosphere of underinvestment permeates throughout the District. Despite these challenges, the City of Phoenix has made significant strides in recent years to improve economic, environmental, and equitable conditions in the District. Some of the major objectives of these efforts are to improve living conditions, housing stock, business, and recreational opportunities throughout. New investments include the construction of the 250-unit mixed income Aeroterra (a HUD HOPE VI revitalization project), a comprehensive planning vision titled Reinvent PHX, upcoming streetscape improvements along Van Buren Street, a planning study for a new Valley Metro light rail station on 16th street, the recently adopted Walkable Urban Code (which seeks to increase density and improve walkability along transit corridors), and the recently awarded Choice Neighborhoods Planning and Action Grant from the US Department of Housing and Urban Development.

This investment of funds and attention from local and federal sources signals a catalytic moment for the District, as it is poised to grow into a more walkable, transit accessible, and economically prosperous portion of the city. As these investments are made, it is critical to maintain and expand the District's affordable housing stock, while making targeted efforts to improve livability concerns such as providing more shading opportunities and encouraging needed retail amenities like grocery stores to establish a presence in the area.



# Neighborhood Challenges



# Recommendation Approach and Strategy

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Recent planning efforts and investments by City agencies have signaled a new era of focused community improvements in the District. Historically undervalued and underserved, the District has faced decades of challenging market conditions, crime, and countless closures of retail and commercial establishments, underscoring the critical need to shift from planning to the implementation of these visionary plans. While many of the recommendations found in this document as well as other planning exercises will require many years to be fully realized, other more immediate actions can take place in the interim. When considering more immediate interventions, the City should seek to implement as many overlapping and mutually supportive strategies found in the Eastlake-Garfield District section of the ReinventPHX policy plan, environmental goals in Sustain PHX, and planning documents resulting from US Department of Housing and Urban Development grants in the area. This will ensure that any resulting Choice Neighborhoods planning efforts builds upon and benefits from the strong work already completed, while building trust and good faith with the community and demonstrating progress towards the implementation of more long-term goals. Suggested efforts include basic capital improvements such as water fountains in parks, better and more connected pedestrian linkages (sidewalks, crosswalks, safe routes to schools, etc.) frequent litter / debris pick-up, and circulator connections to light-rail (particularly for the elderly and disabled).

The recommendations presented over the following pages were developed through careful study of regional and local planning documents, City staff and stakeholder interviews, and a thorough on-the-ground analysis of community characteristics. Each of the resulting recommendations has been informed by best practices as identified by LEED-ND and has been produced with specific attention given to long-term sustainability and resilience. Four key overarching themes guide the specific recommendations found within this document: 1) Affordable Housing, 2) Complete Community, 3) Infill Development, and 4) Neighborhood Fabric. Affordable Housing aims to protect existing affordable housing in the District while seeking opportunities to introduce new units. Primary objectives include building new affordable units tied to the Area Median Income, and striving to develop a diversity of housing types so that residents may continue to live in the community as economic and household conditions change. Complete Community addresses calls by residents to attract and retain desired retail, commercial, and recreational uses to the District. Infill Development focuses on solutions to the abundance of large and small parcels dotting the neighborhood. Neighborhood Fabric highlights the many opportunities to articulate the built environment such that it prioritizes the needs of people as new projects occur. Architectural, landscape, and urban design interventions such as consistent delineation of building facades with ample set-backs to accommodate outdoor uses, street trees, and lighting can work in concert to create a welcoming environment for residents to interact with one another and their surroundings.



## Recommendations

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## Affordable Housing

With a median household income of \$17,991 and an unemployment rate of 11%, the District is a historically disadvantaged community in need of permanent, stable, affordable housing. District residents spend more than 20% of their income on transportation and 6% - 9% on energy, which is likely due to the prevalence of driving commutes and lack of weatherization in homes. Indeed, many public housing units are concentrated in the newly-defined Edison-Eastlake Choice Neighborhoods Community (EEC), but the demand outstrips the supply, and much of this housing stock is outdated and in disrepair. In recent years, the City's Housing Department has made major inroads towards addressing this deficit, namely with the Aeroterra revitalization project, but challenges remain. The City received a Choice Neighborhoods Planning and Action Grant for the EEC from the US Department of Housing and Urban Development, which has the potential to yield further affordable housing gains in the District.

Throughout the Sustainable Neighborhood Assessment- in stakeholder interviews, discussions on the street, and at the community workshop- the evaluation team regularly heard calls for increasing affordable housing options within the District. Building upon the success of the Housing Department, other housing opportunities present themselves that can help alleviate this need such as encouraging the creation of a diverse array of housing types- from granny flats to 3 bedroom apartments- and working with the faith-based institutions that own land in the District to develop these lots into affordable housing. LEED-ND provides additional guidance with Pattern and Design (NPD) credit 4, Mixed-Income Diverse Communities, which promotes equitable neighborhoods by encouraging a spectrum of housing types and affordable units.



Existing public housing in the District



## Action Items

- 1. Public Housing and Affordable Units:** Preserve and increase affordable housing options in the District to help combat gentrification and maintain community cohesion and diversity. The City should explore opportunities to incentivize developers to provide units priced up to 60% and 80% of the Area Median Income in exchange for development bonuses. Continued reinvestment in existing public housing structures should pursue energy and water efficiency standards.
- 2. Diversity of Housing Types:** In order to promote a socially equitable District, provide a wide spectrum of housing types, including single-family homes, 1, 2, and 3 bedroom apartments, and granny flats. This diversity will accommodate residents at different stages of life, income levels, and family sizes ensuring that residents can stay within the District as circumstances change.
- 3. Faith-Based Property Owners:** Encourage local churches to develop and maintain affordable housing on their property and parking lots. There is a particular opportunity for this near the 12th street light rail station, which could serve future residents of affordable housing.



Aeroterra will add 250 mixed-income units to the District

## Complete Community

Completing daily errands such as grocery shopping, dropping kids off at daycare, going to the bank, and buying clothing is a challenging and sometimes impossible task as the District's retail areas are largely characterized by shuttered storefronts, fast food restaurants, and liquor stores. As the SNA team spoke with community members, many raised the issue that they lacked walkable access to basic services, and were unable to complete these tasks within their own neighborhood. In addition to basic services like those described above, the community outreach meeting also revealed a desire for more active and civic space in the neighborhood.

While the district is indeed characterized by vacant storefronts and undeveloped lots, the energy created by the Housing Department's efforts in the District, along with the new light rail and planned improvements to Van Buren Street have set the stage for new opportunities to work with local businesses and developers within the District. Focused efforts to attract retail uses to the District will also help spur local job creation, a critical element to the District's long-term economic sustainability. Neighborhood Pattern and Design (NPD) credit 3, Mixed-Use Neighborhood Centers, encourages the clustering of uses within a quarter-mile walk distance of area residents. Smart Location and Linkage (SLL) credit 5, Housing and Jobs Proximity encourages a balanced community through the generation of jobs within a half-mile of housing units. Green Infrastructure and Building (GIB) credit 5, Existing Building Reuse recognizes the value and embodied energy found in existing buildings and seeks to encourage their reuse through retrofitting structures to meet the needs of new uses.



Many businesses in the District are successful and beloved, though more are needed



## Action Items

- 1. Community Benefits:** Create a clear list of desired community benefits - such as affordable housing, parks, pedestrian improvements, additional shade structures and street trees, and grocery stores or other retail - that can be included as part of future development projects. Encourage Transit Oriented Development along Washington and Jefferson streets, as identified in ReinventPHX.
- 2. Retail Corridors:** Seek to establish new successful retail uses along key corridors in coordination with current street and transit improvements - such as along Van Buren with the upcoming street re-design and beautification, and along Washington and Jefferson streets with the establishment of light rail and associated TOD uses. Job centers outside of downtown could also be a strong and reliable driver of reverse-commute ridership for the Valley Metro light rail system.
- 3. Adaptive Reuse and Historic Preservation:** Successful examples of adaptive reuse throughout the District demonstrate the marketability of this approach, which can yield community retail and housing needs in shorter time-scales than new construction. The introduction of a Historic Preservation Overlay Zone in the Garfield Neighborhood encouraged renovation rather than demolition, and in turn helped preserve the neighborhood's charm and character. A similar strategy could be explored in remaining areas of the District to deliver a similar boost.



Undeveloped lots in the District are poised for redevelopment

## Infill Development

The District is characterized by about 84 acres of vacant land. Many of these lots are relatively small, while St. Luke's Medical Center owns much of the larger parcels for possible future expansions. Complicating development efforts, as the result of industrial dumping in the 1960's and 70's by a Motorola semiconductor plant, the majority of these vacant lots are potential brownfields. Despite these circumstances, however, great infill development potential exists within the District that the City and private development community can focus on prioritizing.

Infill development within the District should be focused on ensuring that new uses contribute positively to the character of the District, including compatibility with low- and middle-density historic fabric in the Garfield neighborhood. Consider reviewing infill standards in the Garfield neighborhood to ensure that future infill is of a scale and character that will cultivate and improve the neighborhood's historic qualities. Within the Edison neighborhood, given the uncertainty surrounding St. Luke's Medical Center's possible campus expansion plans, the City should prepare for a variety of potential development scenarios while moving forward with positive community development in the Choice Neighborhoods area around the hospital and recognizing the impact any expansions may have on employment for nearby residents.

The area around the railyard can be a great opportunity for a healthfield or food production area. Investigating possibilities of food manufacturing, farming, or installing some kind of job center would serve as a community win-win. Despite the desire of community members for housing at these locations- unlikely due to FAA restrictions- having a land use that is a community benefit may still be well-received as long as affordable housing needs are addressed elsewhere and is in a format that serves the community.

Smart Location and Linkage (SLL) credit 1, Preferred Locations, credit 2, Brownfield Redevelopment, and credit 5, Housing and Jobs Proximity all encourage infill development, recognizing its potential to deliver meaningful neighborhood change.



New infill development along the light rail corridor should be prioritized



## Action Items

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- 1. Large Parcels:** The development of several large vacant parcels in the District stands to set the tone and vision for future developments throughout the area. Consider potential land swaps or sales between St. Luke's Medical Center and the City or other nearby property owners to assemble viable development parcels and/or fund affordable housing development citywide. As the City's Housing Department completes the Aeroterra development and focuses on other city-owned parcels in the District, redevelopment and retrofit efforts can also improve streetscape and walkability conditions through the implementation of the Walkable Urban Code and the policies of the ReinventPHX TOD policy plans.
- 2. Special Uses:** The District is home to many undeveloped small lots, which can be leveraged for their potential to temporarily host innovative ideas that promote visions for the district put forth by residents such as urban farms, pop-up marts, medical clinics, and recreational spaces. The City's Brownfields to Healthfields initiative is a great example of how these lots can be activated with publicly beneficial interim uses that help demonstrate the District's potential while a site makes its way through the entitlement process for a more permanent use.

Explore the concept of a "Health District" that increases interaction between local hospitals and the neighborhood to promote healthy lifestyles and services. In a related strategy, seek to leverage and integrate with the Community Health Needs Assessment process now required by the federal Affordable Care Act, which requires hospitals receiving federal funding and tax breaks to study and provide community benefits for local disadvantaged communities. These efforts could include St. Luke's as well as Banner Good Samaritan Medical Center, the cluster of university medical uses and teaching facilities at 7th and Van Buren streets, or other local hospitals with an interest in investing in low-income communities.

Encourage new job uses, research and development, or other creative non-residential uses south of Washington and Jefferson streets near the railyard. Jobs centers outside of downtown are also a strong and reliable driver of reverse-commute ridership for the light rail system.

- 3. FAA Lots:** The City's Aviation Department acquired land through its buy-back program, and is now seeking to re-introduce positive new uses for these vacant parcels that are mutually compatible with the City's, FAA's, and neighborhood's goals, such as parks and gardens, food production, and other community spaces. This strategy will help address the "missing teeth" condition these lots contribute to near the railyard while dealing with the realities of the FAA development restrictions.

## Neighborhood Fabric

The District is in need of human-scaled urban design improvements to facilitate walking and cycling, and improve the area's aesthetic. Through the steady accumulation of improvements to the neighborhood fabric such as street trees, sidewalk improvements, and bicycle lanes or cycle tracks, the City can transform the District into a more comfortable and welcoming area for people to live and work that supports transportation across a variety of platforms. The City can work to ensure implementation of existing walkability requirements and guidelines from the Walkable Urban Code, and the ReinventPHX TOD policy plans to give more focused attention and respect to walking and cycling as viable forms of transportation, which is of particular importance in disadvantaged communities with residents that may lack access to private vehicles.

LEED-ND credits in the Neighborhood Pattern and Design (NPD) category focus heavily on the creation of communities that facilitate and encourage walking, cycling, and transit use- the core elements of Human Scale Design. NPD prerequisite 1 and credit 1, both named Walkable Streets, promote the creation of a walkable environment through a 1:3 building height to street width ratio, requiring building frontages to face public spaces, minimizing curb cuts in sidewalks, and street designs that are safe for pedestrians and cyclists. NPD prerequisite 2, Compact Development, contributes to this vision by providing the requisite number of people to activate a public space by requiring a minimum of 12 dwelling units an acre or a .8 floor area ratio. Again, prioritizing pedestrian experience over vehicles, NPD credit 5, Reduced Parking Footprint, places parking lots at the rear or side of new non-residential buildings and multi-unit residential or mixed-use buildings. NPD credit 14, Tree-Lined and Shaded Streets further contributes to a welcoming urban realm through the introduction of street trees at an average interval of 40 feet or less.



Fixed shade structures are an effective strategy where trees are not appropriate



## Action Items

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- 1. Shade:** Incorporate context-sensitive tree planting guidance as stipulated in the landscape standards chapter of the Walkable Urban Code (Section 1309) into any short-term neighborhood improvements resulting from a Choice Neighborhoods Planning Grant, and other public realm improvements throughout the District.

Where trees are impractical or unsuitable, consider the installation of permanent fixed structures, especially along pedestrian corridors and at transit stops to provide relief from the sun. When utilizing fixed shade structures, follow Crime Prevention Through Environmental Design (CPTED) principles to address community safety concerns.

- 2. Walking and Biking:** The recently adopted Walkable Urban code provides urban design standards in line with LEED-ND, and should serve as a foundational document for any development discussions within the District.

Several north-south streets (12th and 16th) and east-west streets (Van Buren and Fillmore) have potential to be retrofitted to accommodate pedestrians and cyclists in a safe, comfortable manner, yielding a more equitable distribution of travel options. Consider the incorporation of covered bicycle storage lockers at Valley Metro light rail stops to facilitate and encourage multi-modal transportation and support transit enhancements through the District as the Transportation 2050 plan is implemented.

- 3. Streetscape Improvements:** Ensure that a physical form that promotes walkability is prioritized in future planning documents, development plans, development agreements and engineering improvements throughout the District. Given the neighborhood's challenges with heat, consistent application of street trees in accordance with the Walkable Urban Code can help address walkability issues while simultaneously improving the overall aesthetics of the District.

Continue and expand the City's existing practice of encouraging and requiring aggressive stormwater management best practices such as infiltration, on-street swales, and retention of stormwater on private development parcels. This reduces the downstream impacts of erosion and water pollution while contributing to Phoenix's long-term water supply and aquifer re-charge goals. Seek to integrate these "green streets" strategies into future streetscape improvements such as upcoming re-design of Van Buren Street as well as throughout the EEC in creating its Neighborhood Transformation Plan.

Consider encouraging or requiring surface parking lots to be located behind any new structures in order to provide continuous facades and minimize sidewalk intrusions along the curb, yielding a more consistent urban realm oriented towards pedestrians rather than vehicles.

# Sustainability Assessment

The Sustainable Neighborhood Assessment tool includes an annotated LEED-ND checklist created by Global Green. It is a key component of the process used to document and compare the assessment area against the LEED-ND prerequisites and credits. Each credit within the three credit categories (Smart Location & Linkage, Neighborhood Pattern & Design, and Green Infrastructure & Building) is marked as “achieved,” “not achieved,” “unknown,” or “not applicable” under baseline conditions. Additional analysis has been done based on local planning policy, regulatory support, technical feasibility, market support and stakeholder input. The preliminary checklist analysis was edited after site visits, stakeholder meetings, and conversations with city staff. This information was then translated into an overall assessment of sustainable neighborhood performance.

Based on the in-field assessment, planning document review, various stakeholder meetings, the Global Green team estimated which LEED-ND credits were “Likely,” “Possible with Effort,” “Unlikely” to be achieved, or “Not Applicable,” considering existing conditions, technical feasibility, policy readiness, financial burden, and applicability to neighborhood conditions. The bar graph summary identifies the overall level of sustainable neighborhood performance for the District. Many credits fall into the “Likely” category, and of the remaining credits, a significant percentage fall within the “Possible with Effort” category, which shows the large potential for improving the sustainability of the neighborhood, specifically by pursuing the high-priority recommendations described in this report.

The summary table below shows the numeric values extrapolated from the percentage of credits identified as “Achievable” below. The recommendations listed in the previous pages are largely a response to LEED-ND criteria which achieving was identified as “Possible with Effort” by the assessment team. While these values do not correlate exactly to specific LEED-ND points, they provide an estimate of the neighborhood’s potential level of future achievement. It should be noted that this is a rough measure of performance and not an exact representation of the neighborhood’s level of possible certification. It should also be noted that all the prerequisites must be achieved if certification will be pursued. While recognizing these constraints, the categories generated through the assessment serve as a useful metric for estimating formal LEED-ND certification. Given the presumption that all those designated as “Achievable” would be met, providing a baseline point tally of 42 points, yielding a likely rating of silver from the USGBC. If those listed as “Possible with Effort”, are aggressively pursued and achieved, affording an additional 32 points, the District may be able to earn a gold designation.

	Total	Achievable with Current Conditions	Possible with Effort
Smart Location And Linkage	27	10	6
Neighborhood Pattern and Design	44	22	17
Green Building and Infrastructure	29	11	9
	<b>100</b>	<b>42</b>	<b>32</b>
<u>LEED-ND Certification Thresholds:</u>			
	Certified: 40-49	Silver: 50-59	Gold: 60-79
			Platinum: 80+

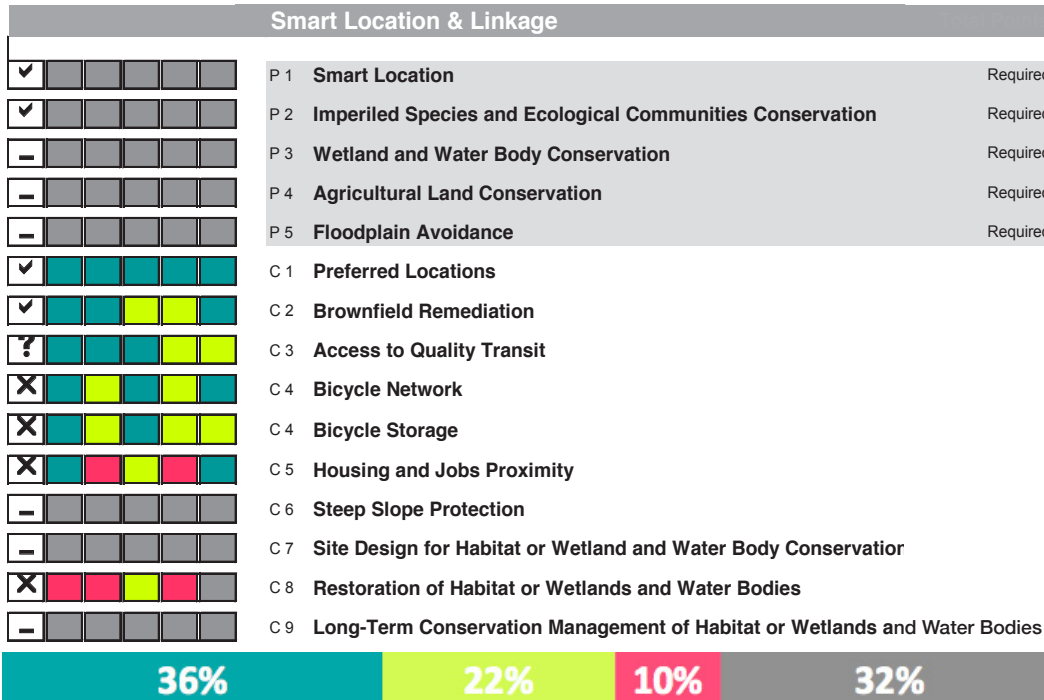


# Sustainability Assessment

Baseline Conditions
Local/Regional Planning Priority
Regulatory Support
Technical Feasibility
Market Support
Neighborhood Need/ Stakeholder Input

## Eastlake-Garfield District, Phoenix, AZ

Legend	
✓	Achieved
?	Unknown
X	Not Achieved
-	Does not exist/ NA
■ (Teal)	Explicit support/ no technical issues
■ (Yellow)	Lack of explicit support/ minor technical issues
■ (Red)	Opposition/ significant technical issues
■ (Grey)	Not Applicable



### Smart Location and Linkage

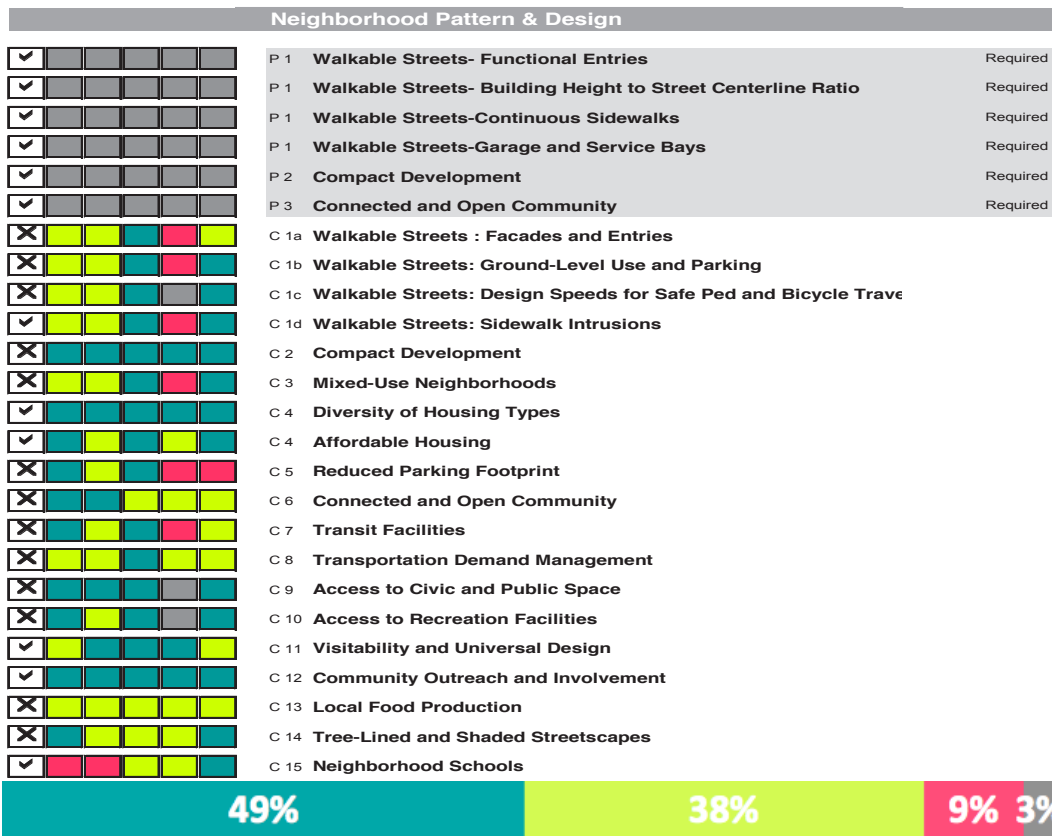
Smart Location and Linkage focuses primarily on existing site conditions to ensure that developments are not located in floodplains, on steep slopes or cause damage to ecological communities or local water bodies.

# Sustainability Assessment

Baseline Conditions
Local/Regional Planning Priority
Regulatory Support
Technical Feasibility
Market Support
Neighborhood Need/ Stakeholder Input

## Eastlake-Garfield District, Phoenix, AZ

Legend	
✓	Achieved
?	Unknown
✗	Not Achieved
-	Does not exist/ NA
■ (Teal)	Explicit support/ no technical issues
■ (Yellow)	Lack of explicit support/ minor technical issues
■ (Red)	Opposition/ significant technical issues
■ (Grey)	Not Applicable



### Neighborhood Pattern and Design

Neighborhood Pattern and Design aims to influence the physical layout and design of the community to yield walkable neighborhoods with a variety of land use types.



# Sustainability Assessment

Baseline Conditions
Local/Regional Planning Priority
Regulatory Support
Technical Feasibility
Market Support
Neighborhood Need/ Stakeholder Input

## Eastlake-Garfield District, Phoenix, AZ

Legend	
✓	Achieved
?	Unknown
X	Not Achieved
-	Does not exist/ NA
Teal	Explicit support/ no technical issues
Yellow	Lack of explicit support/ minor technical issues
Red	Opposition/ significant technical issues
Grey	Not Applicable

Green Infrastructure & Buildings	
X	P 1 Certified Green Building Required
✓	P 2 Minimum Building Energy Performance Required
✓	P 3 Indoor Water Use Reduction Required
✓	P 4 Construction Activity Pollution Prevention Required
X	C 1 Certified Green Buildings
X	C 2 Optimize Building Energy Performance
X	C 3 Indoor Water Use Reduction
X	C 4 Outdoor Water Use Reduction
✓	C 5 Building Reuse
✓	C 6 Historic Resource Preservation and Adaptive Use
-	C 7 Minimized Site Disturbance
✓	C 8 Rainwater Management
X	C 9 Heat Island Reduction
X	C 10 Solar Orientation
X	C 11 Renewable Energy Production
X	C 12 District Heating and Cooling
✓	C 13 Infrastructure Energy Efficiency
X	C 14 Wastewater Management
X	C 15 Recycled and Reused Infrastructure
X	C 16 Solid Waste Management
X	C 17 Light Pollution Reduction



### Green Infrastructure and Buildings

Green Infrastructure and Buildings seeks to optimize individual buildings and surrounding infrastructure systems to reduce their energy and water consumption and associated emissions.

# Appendix

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## A. LEED for Neighborhood Development Credit Categories

### Smart Location and Linkage [SLL]:

SLL focuses on preserving the environmental characteristics inherent to the site such as water body and steep slope protection and influencing development patterns to reduce sprawl and automobile dependence. Credits in this category encourage locating new developments near city centers with robust public transportation options and sites that have been previously developed or are immediately adjacent to existing development.

### Neighborhood Pattern and Design [NPD]:

NPD influences the physical layout and design of the community in question through minimum thresholds for density, internal and external connectivity, and characteristics of a walkable community such as continuous sidewalks or building frontages that face public streets. Credits in this category reward projects that have nearby civic, educational and recreational facilities, limited surface parking and have transportation facilities complete with maps and bicycle racks.

### Green Infrastructure and Buildings [GIB]:

GIB emphasizes the importance of the optimized performance of structural systems and city infrastructure through minimum building energy and water efficiency, water-efficient landscaping and on-site renewable energy production. Credits in this category promote the adaptive reuse of existing buildings, on-site stormwater management, recycled content in infrastructure such as roadbeds and energy efficient traffic lights, street lights and water pumps.

For more information, please visit [www.usgbc.org](http://www.usgbc.org)

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