

## Environmental Systems and Societies: Applications of Environmental Policies to Ensure the Establishment and Conservation of Los Angeles Parks and Green Spaces

Marian Walker  
*University of California Santa Barbara*

Los Angeles is one of the fastest-growing centers of innovation and economic productivity in the world. Although, consideration for parkland and open green spaces is often muddled by ongoing large-scale development projects within the city. This study focuses on an assessment of the extent to which the city of Los Angeles has been effective in forming and utilizing the Sustainability City pLAN to establish and preserve parks and other green spaces. The scope of the investigation takes into account progress made by local nonprofit organizations, university involvement, and municipal legislative action on the basis of their combined abilities to expand upon and maintain existing green space networks. Specifically, the Los Angeles Sustainability City pLAN can be attributed to efforts made in coalition between the Los Angeles Neighborhood Land Trust, TreePeople, the University of California Los Angeles, the Los Angeles Department of Parks and Recreation, and the Los Angeles City Council. The plan's progress and formation are to be analyzed in the context of park conservation and overall sustainability based upon data and accomplishments provided by the aforementioned community, university, and legislative initiatives. Environmental impact is privy to the availability of newly introduced parkland or open green space within the city and local residents' proximity to these areas, especially in marginalized communities. Findings indicate that the Los Angeles municipal government has achieved the expansion of park networks through the use of resources provided through collaborations with community leaders to improve green spaces within the city. This new approach to city planning with regard to open green space in Los Angeles has successfully developed a strategy for funding park maintenance, encouraged urban agriculture in vacant areas, enhanced biodiversity, and expanded LA's growing urban forest. Altogether, this plan has increased urban ecological benefits for overall biodiversity within the city of Los Angeles and has the potential to provide a framework for sustainable land use in metropolitan capitals around the world.

## Background

Urban ecology is described as the study of ecosystems that reside in cities and urbanizing landscapes with an aim of understanding the connection between human societies and ecological processes to support a more sustainable coexistence. The importance of this study stems from the projection that by 2030 populations of global cities will grow by 2 billion (Indiana). According to the Los Angeles Department of Parks and Recreation, from 2000 to 2023, Los Angeles is expected to see a population rise of about one million as shown in Figure 1. The urbanization of our planet has and will continue to have a negative impact on our world's natural systems. However, it is a social responsibility to mitigate these effects in order to maintain air, water, and soil quality for all life on earth. Within cities, green spaces, such as parks or community gardens, aid in filtering air pollution, producing oxygen, mitigating heat absorption, and providing habitats for wildlife. Forming a more cohesive understanding of the interactions between humans and wildlife within urban environments is necessary to sustain the lives of all flora and fauna in years to come (Indiana).

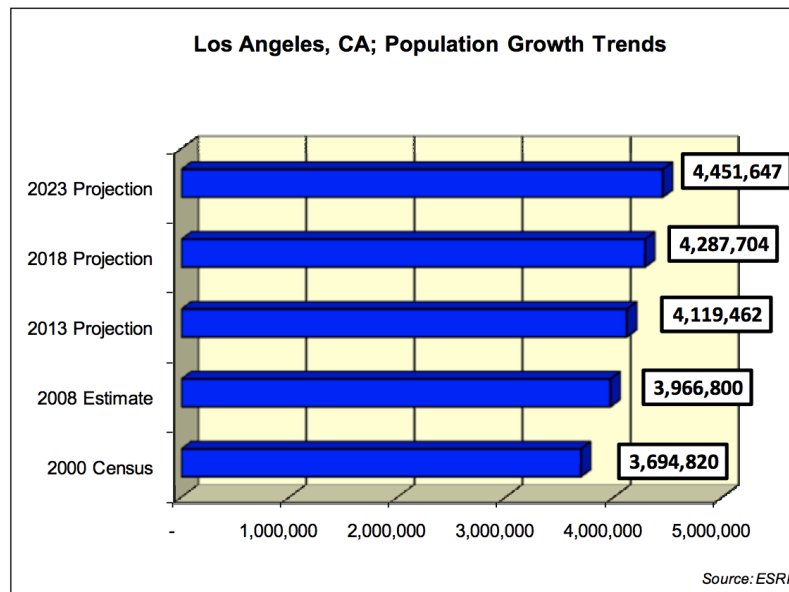


FIGURE 1. Los Angeles population growth predicted trends (LA Parks & Rec., 2009).

## Los Angeles and the Rise of Urban Ecology

In recent years, the city of Los Angeles has become increasingly concerned with sustainable development and managing the coexistence of urban and natural environments within its boundaries. Specifically, the creation of the Los Angeles Sustainability Plan or “pLAn” has been the city’s response to growing public concern for the environment and propositions made by the University of California Los Angeles in

partnership with local government offices. The plan’s intentions encompass park management and the revitalization of natural resources in order to conserve wildlife and promote city park growth, while considering current societal factors and potential changes leading into the next decade (Christensen, 2015). These projected changes have led to the consideration of the extent to which Los Angeles has been effective in not only forming but utilizing the Sustainability City pLAN to establish and sustain parks and green spaces within the city.

**Environmental Impact of Open Green Spaces in Los Angeles**  
 According to the University of California Los Angeles, the increase of parks and open green spaces provides a slew of benefits to offset environmental degradation. The presence of greenery within cities works to decrease the urban heat island effect known to cause heightened air pollution levels and temperatures in developed areas, as shown in Figure 2. Added greenery also allows rainwater to infiltrate permeable ground to prevent toxic urban runoff from reaching local water sources (Gold et al., 2015). Open green spaces also serve to protect and enhance habitats, ecosystems, and biodiversity within cities. The Santa Monica and San Pedro Bays alongside the Topanga mountain range that surrounds the city are all home to both endangered and threatened endemic species that rely on open space corridors for their well-being and survival. Green spaces serve as corridors that allow species to migrate through cities with greater ease which directly combats habitat fragmentation and supports stable populations (Gold et al., 2015).

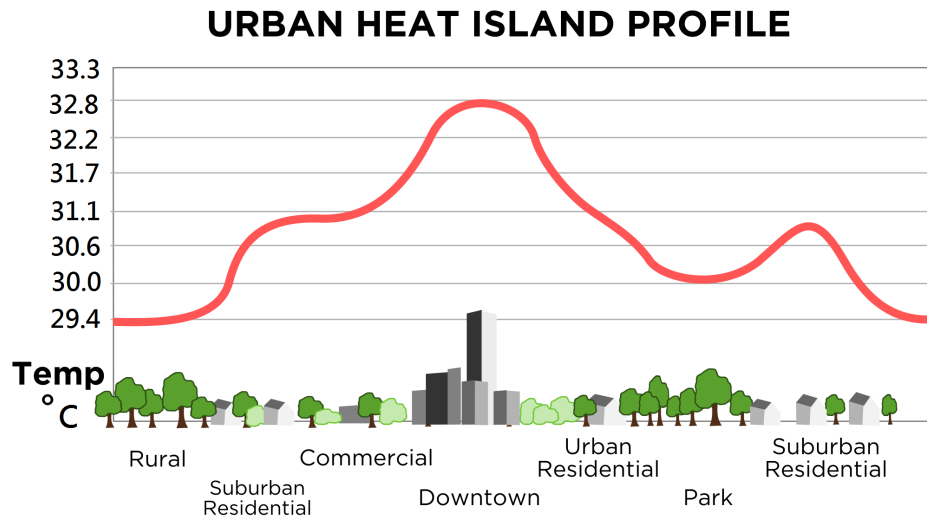


FIGURE 2. Metropolitan profile displaying lower heat island levels in green spaces (Muk, 2016).

## Origins in Grassroots Organizations

Grassroots movements have the power to force significant changes in society's most powerful institutions. Within a study conducted by Julian Agyeman, professor of Urban and Environmental Policy and Planning at Tufts University, titled, "Environment: Science and Policy for Sustainable Development," he argues that in order to develop sound urban environmental policy frameworks, community-led coalitions of neighborhood workers and non-profit organizations must come together to prioritize socio-environmental concerns to facilitate desired changes (Agyeman, 2005, p. 15).

Before the Los Angeles Sustainability pLAN had been drafted, grassroots organizations formed by concerned Los Angeles citizens, or self-proclaimed "Angelenos," worked to establish public parks and guide tree-planting efforts to promote sustainable urban ecosystems. Two prominent local organizations that acted as catalysts for the Los Angeles urban ecological movement are the Los Angeles Neighborhood Land Trust and TreePeople.

After a report conducted by the Los Angeles Urban Land Trust Task Force in 2000 was released, a shortage of green spaces in underserved Los Angeles communities was revealed and addressed by the Los Angeles Neighborhood Land Trust aided by legislative funding. This directly resulted in the creation of 27 parks and gardens maintained by local committees (Bodke).

Further, TreePeople's contributions over past years have included planting hundreds of thousands of trees and restoring damaged parkland such as that of Los Angeles' Griffith Park (TreePeople). Early action taken to address a rising need for urban sustainability was undertaken by Los Angeles' Mayor Antonio Villaraigosa in partnership with the organization through the passage of the Million Trees Los Angeles Initiative of 2006 (TreePeople). However, at this point Los Angeles still lacked a formal, structured plan that would be necessary to ensure progress in years to come.

## State of the Los Angeles Park System

2009

In 2009, the Los Angeles Department of Parks and Recreation conducted and finalized a citywide community needs assessment to direct services to areas in need over the next few years. The department also referred to data from other major cities in the United States to aid in this process of finding feasible methods to implement parks and green spaces in large metropolitan areas. While Houston, Texas was found to have 9.9 acres of parkland per thousand residents, drawing on results from surveys conducted by the Los Angeles Urban Land Trust Task Force, the LA Dept. of Parks and Recreation found Los Angeles to display significantly less parkland per capita, with only 4.0 acres of parkland per thousand residents (LA Department of Parks and Recreation, 2009).

To address maintenance issues regarding the upkeep of green spaces within the city, the department conducted a review of its own facilities to make sure available resources could permit the establishment of new parks while maintaining preexisting ones. Such concerns had not been thoroughly assessed since 1999 due to limited outreach tools. The development of GIS (Geographical Information Systems) mapping and technological outreach methods allowed the department to study demographics of geographical and spatial data more closely in 2009 (LA Parks).

Focusing on sustainability and conservation efforts, park improvements would update currently established facilities to meet the demands of ecological concerns. Specifically, the plan would update irrigation systems by installing weather-smart controllers to conserve water by preventing over-watering by monitoring precipitation levels as demonstrated in the figure below (LA Parks). New electrical equipment and energy conservation standards were met through the additions of solar lighting to improve energy efficiency and reduce operation costs. The Los Angeles Department of Parks and Recreation Camping and Forestry division also proposed the use of CAMPostables; the promotion of biodegradable eating utensils at campgrounds and other park facilities (LA Parks). This plan was eventually put into effect by the Los Angeles Board of Recreation and Park Commissioners.

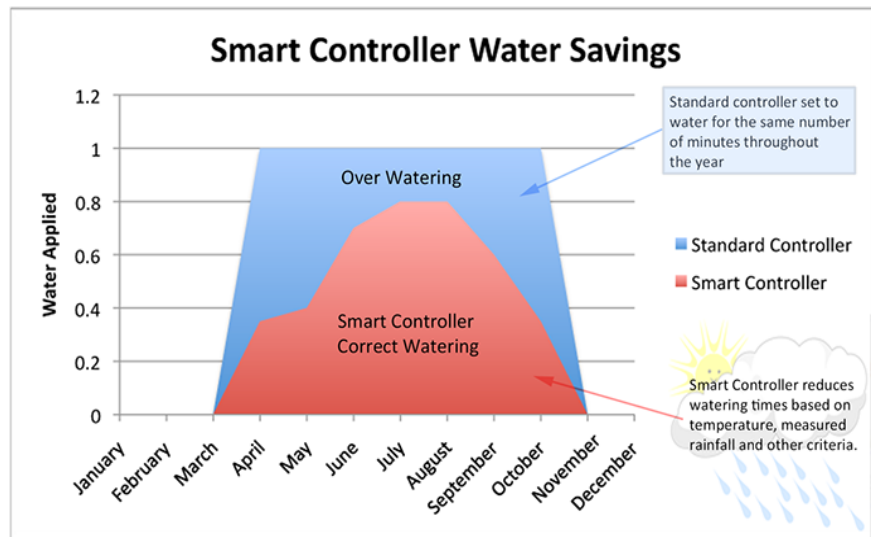


FIGURE 3. Smart water irrigation controller vs. normal irrigation system (Park Landscape Associates, 2012).

2012

As of 2012, three years after the proposal of the Parks and Recreation Department's plan, the city of Los Angeles managed a total of 15,000 acres of parkland and urban forest comprised of 700,000 street trees

courtesy of the Million Trees Los Angeles Program and continued efforts by local organizations such as TreePeople (Gold et al., 2012). However, access to parkland was still deemed overall insufficient as it remained concentrated in regions of the city away from underserved neighborhoods. Statistics showed that only 40% of Los Angeles residents lived within ¼ mile of parkland and that areas of high need were concentrated in Central and South Los Angeles communities as shown in Figure 4 (Gold et al., 2012). These vulnerable zones, predominantly comprised of low-income communities of color, had long since been subject to “green gaps” or a lack of available green space due to unequal resource distribution in previous planning efforts (Anguelovski et al., 2018, p. 1). However, an abundance of spaces such as lots or city-owned property remained vacant in these areas, waiting to be feasibly converted into usable parkland (Gold et al., 2012).

In 2012, Mayor Villaraigosa began the “50 Parks Initiative” to aid in providing green spaces to areas in greatest need (Gold et al., 2012). Environmentalists hoped to use this initiative as a springboard for which to begin incorporating different sizes and types of open spaces into a more sustainable development plan. As a result, this idea posed another set of challenges to the Los Angeles Department of Parks and Recreation, as it would involve managing a vast network of smaller converted spaces opposed to a smaller number of larger parks. This was a call to action for the Los Angeles city legislature to fund maintenance and park creation to prevent the burden from falling on local residents.

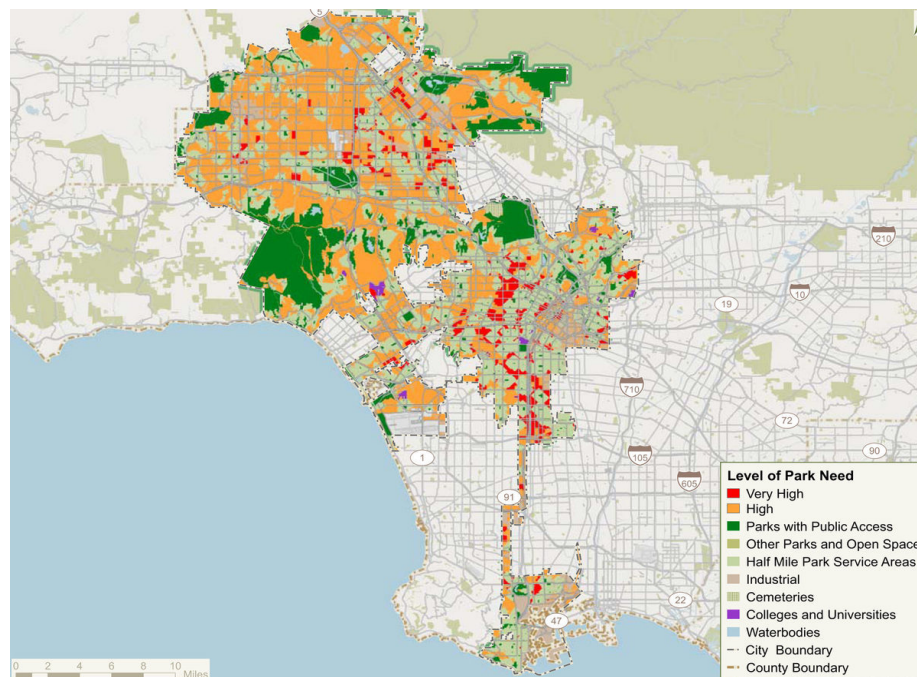


FIGURE 4. Los Angeles park needs assessment map comparing areas of low (red) to high (green) open space concentration within Los Angeles county (Brasuell, 2012).

## University of California Los Angeles's Research, Objectives, and City Plan Refinement 2012

The University of California Los Angeles first called upon the city to take action to improve the urban environmental sustainability efforts in 2012 with the creation of Vision 2021 Los Angeles, a plan formed to act as a model sustainability agenda for the next mayor (Gold et al., 2012). The authors of the plan, environmental experts at the university, sourced existing and past Los Angeles city initiatives, environmental sustainability plans from other cities, and the works of environmental professionals (Gold et al., 2012). "There's never been a comprehensive environmental sustainability plan for Los Angeles," stated co-author of Vision 2021 Los Angeles Mark Gold, a UCLA professor, associate director of the Institute of the Environment and Sustainability, and former president of the local nonprofit Heal the Bay. "We hope that Vision 2021 Los Angeles serves as the basis of candidate discussion on the immediate environmental future of Los Angeles. The plan is an ambitious vision that creates measurable accountability within a timeframe that a single mayoral administration and Council can tackle." (Hewitt, 2012) Under this plan, the three main objectives stood to create an urban environment in which all residents were within ½ mile of green or open space, form a green space master plan for Los Angeles with an emphasis on increasing access for underserved and high-density communities, and to develop and sustain these spaces to support their diverse uses throughout the city (Gold et al., 2012).

## 2013

In 2013, UCLA expanded upon these principles and designed the Sustainable Los Angeles Grand Challenge, a multi-year initiative focused on finding solutions for environmental problems facing Los Angeles by enhancing overall ecosystem health within the city while creating a usable model for the rest of the world (Federico, 2015). Moreover, UCLA established three main objectives for such enhancement: to encompass the assessment of biodiversity and ecosystem health by the establishment of public education of the presence and distribution of ecosystems and habitats in Los Angeles County, enhance ecosystem health and resiliency through the integration of biodiversity into the built environment and the restoration of local ecosystems, and understand and measure the relationship between ecosystem and human health by ensuring equal access to green spaces and natural areas (Federico, 2015). Led by the Institute of the Environment and Sustainability at the University of California Los Angeles, these objectives magnified those of existing plans to further integrate Los Angeles's urban society with natural environments

through the construction of parks, gardens, or additions of greenery (Federico, 2015).

2015

As of 2015, UCLA's Institute of the Environment and Sustainability historically issued the nation's first environmental report card for a major metropolitan area (Federico, 2015). The purpose of the 2015 report card was to establish a baseline from which to measure Los Angeles' progress toward environmental sustainability and to act as a catalyst for future policy changes in order to create a healthier environment. The Sustainable Los Angeles Grand Challenge provided a natural opportunity to align its goals with this initial report card which would later be implemented into the Los Angeles Sustainable City pLAN with continued release of annual progress reports.

2017

In light of UCLA's efforts, Los Angeles Mayor Garcetti stepped in to create a council, the Los Angeles Sustainability Leadership Council, in collaboration with the university's chancellor, Gene Block, to combine the efforts of the UCLA Grand Challenge with the city's own agenda in what became the Los Angeles Sustainable City pLAN (LAMayor). "Building a sustainable Los Angeles is one of the great challenges of our time and we need our greatest minds working together to meet it. The Los Angeles Sustainability Leadership Council will support the collaboration and innovation we need to help us fight climate change, protect our environment, and build an economy for the next generation," quoted Mayor Garcetti in an interview on the matter.

### Los Angeles Sustainability City pLAN Goals

The overall goal of the Los Angeles Sustainability pLAN is to build upon past accomplishments of the previously discussed initiatives. As of 2017, Los Angeles managed 16,000 acres of parkland with 700,000 trees in its urban forest (Petersen, 2017). Within the past six years, 35 parks and roughly 500 urban agricultural sites have been added to the city (Petersen, 2017). Mayor Garcetti also worked to receive federal agreements to restore 11 miles of the Los Angeles River (Petersen, 2017). Furthermore, by generating new green spaces, the program would work to not only address but also combat current and future effects of climate change on Los Angeles communities. With frequent droughts and rising temperatures within the county, maintaining shade and conserving water also form priorities for the program.

### Strategies

Strategies of the pLAN are set to ensure access to open space, parkland, and the Los Angeles River for all Los Angeles residents. To address the



revitalization of the Los Angeles River, 11 miles of restoration work and infrastructure maintenance is underway to provide public access to the entire 32 miles it spans within the city (Petersen, 2017). Specifically, the city hopes to join properties directly adjacent to the river along with updating trails to increase such access. Increasing the number of parks and open spaces for Los Angeles residents has relied on expansion of the 50 Parks Los Angeles initiative to obtain and transform properties into usable parkland for Los Angeles neighborhoods. This expansion also includes adding to citywide green infrastructure. In order to protect and support biodiversity, the city has adopted a “no-net-loss” strategy to maintain overall diversity balance by actively replenishing lost natural resources (Petersen, 2017). Watershed protection policies and anti-rodenticide policies are also in progress. Funding for park addition and improvement programs is directly sourced from philanthropy and organized partnerships with the municipal government to provide sites for green spaces sourced from parkways or open lots through the pLAn (Petersen, 2017).

### Moving Forward with the “pLAn” and Progress

As updated in an annual report regarding progress made towards creating an efficient urban ecosystem, the pLAn is on its way to supporting 56% of Los Angeles residents within a half mile of parkland or open green space (Petersen, 2017). Under the pLAn, by 2018, 41.5% of residents would reside within ½ mile of either parkland or open green space (Petersen, 2017). The Department of Parks and Recreation along with nonprofit-partnered organizations have made progress to develop open space areas in underserved neighborhoods. Additionally, the pLAn is still working to create five miles of publicly accessible Los Angeles River space (Petersen, 2017). In the summer of 2017, Los Angeles Riverworks was able to open the Zev Yaroslavsky Greenway Trail, adding ½ mile of open space along the Los Angeles River (Petersen, 2017). As far as achievements of the pLAn thus far, it has successfully developed a strategy for funding park maintenance in coercion with nonprofit partners, passed legislation that not only allows but encourages urban agriculture (ie. community gardens) in vacant areas, developed a city biodiversity strategy, and initiated a tree registry to document Los Angeles’s growing urban forest to further guide tree planting efforts.

### Conclusions

Applying environmental policies to ensure the establishment and conservation of parks and green spaces forms a bridge between environmental activism and legislation that relies on a coercive plan to generate positive results. The development of the Los Angeles Sustainability City pLAn is formally attributed to efforts made on the part of local NPOs and the University of California Los Angeles in collaboration with the Los Angeles municipal government. To a great extent, Los Angeles has been able to develop and utilize the Sustainability

City pLAN to provide a promise for future improvements to the city's open space network. As efforts made towards a sustainable future carry on, policies must continue to promote coexistence with the natural world within and beyond the city's boundaries for the benefit of both human and nonhuman inhabitants.

Findings indicate that increased availability of open green spaces and parkland in Los Angeles has led to a gradual decrease in temperatures created by urban heat islands. Further, the added availability of uncovered permeable ground space has prevented toxic urban runoff from reaching local freshwater sources by allowing rainwater to more effectively infiltrate. Additional benefits from open spaces for the natural environment include the enhancement of protection for habitats, ecosystems, and biodiversity within city boundaries.

The pLAN's success thus far can be attributed to a number of non-profit organizations within the Los Angeles metropolitan area. TreePeople, an environmental advocacy group based in the city, planted hundreds of thousands of trees to expand Los Angeles's urban forest and engaged in restoration efforts to recover damaged parkland. A task force led by the Los Angeles Land Trust added to these efforts by conducting city-wide surveys to assess public accessibility and proximity to open spaces throughout the area. These actions facilitated by community-led grassroots organizations prompted the passage of the Million Trees Los Angeles Initiative, a first major step for Los Angeles legislators to address a growing need for open spaces and contribute to the city's growing urban forest.

The University of California Los Angeles assisted in drafting a model for the Sustainability City pLAN by sponsoring leadership from the Institute of the Environment and Sustainability. In 2012, UCLA first called upon a citywide plan to improve Los Angeles's environmental sustainability efforts by releasing, *Vision 2021 LA*, a model sustainability agenda for the incoming mayor as well as the Sustainable LA Grand Challenge, a multi-year initiative focused on finding solutions for environmental problems by enhancing overall ecosystem health. Within these projects, the three main objectives stood to create an urban environment in which all residents were within ½ mile of open space, form an open space master plan for Los Angeles with an emphasis on increasing park access for underserved or high-density communities, and support its diverse uses (ie. community gardens, recreation, etc.) throughout the city. Three years later, in 2015, UCLA issued the nation's first environmental report card for a major metropolitan area, a method later used to keep track of the Sustainability City pLAN's progress.

Following its establishment within Los Angeles's legislative frameworks, the pLAN has successfully developed a strategy for funding park maintenance in coercion with nonprofit partners, legalized urban agriculture in vacant areas, developed a city biodiversity protection

strategy, and initiated a tree registry to document LA's growing urban forest while further guiding tree planting efforts.

Although as of 2018, 41.5% of the city's residents reside within ½ mile of parkland or open green space, the Los Angeles Department of Parks and Recreation has begun efforts in collaboration with nonprofit partners to focus on establishing green spaces neighborhoods, particularly in socioeconomically disadvantaged communities, that fall outside this margin in years to come.

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