

# Urban Trees Initiative

## Executive Summary



Extreme heat from climate change is a growing concern in Los Angeles. Current predictions suggest that by 2060 the city will see temperatures of 95 degrees Fahrenheit or higher 40 days per year.

With higher temperatures come greater risks to human health, including life-threatening conditions such as heat stroke and heart attacks. High temperatures also lead to increases in harmful air pollution that can trigger health issues for residents.

Unfortunately, communities of color and those with low incomes are disproportionately more likely to live in areas with less shade and worse air quality. For the University of Southern California and the City of Los Angeles, this inequity is an important issue of environmental justice.

In April 2019, Mayor Eric Garcetti announced Los Angeles' [Green New Deal](#) in response to the global climate emergency. The Green New Deal includes ambitious goals to address shade inequity; the city aims to plant 90,000 new trees and the plan calls for a 50 percent increase in land area covered by tree canopies in neighborhoods with the greatest need.

Increasing the urban tree canopy reduces risks caused by heat and pollution, improves health outcomes and general well-being, and makes urban neighborhoods more walkable, more enjoyable, more livable environments.

The Urban Trees Initiative is a collaboration between USC and the City of L.A. to guide the growth of an urban forest on the Eastside. This is part of a growing partnership between the city and USC as envisioned by Mayor Garcetti and President Carol L. Folt. Under this partnership, USC developed a strategic vision that recommends where the city and others could plant trees, as well as how many and what types of trees, to achieve the greatest benefit to the health and well-being of local residents. The initiative

presents a vision for climate justice that is driven both by data and meaningful engagement with the people who live in the area.

The multidisciplinary research team is composed of USC faculty and students with expertise in advanced mapping techniques, earth sciences and landscape architecture. The team studied a 5-square-mile area surrounding USC's Health Sciences Campus that is home to underserved communities, including much of Lincoln Heights, El Sereno and Ramona Gardens.

The project team spent time in the area and held several meetings with community members to understand their needs and preferences for green space. A total of 28 individuals attended these meetings, including representatives from pertinent nonprofits, local businesses and L.A. City Council district offices. Combining social priorities with scientific data, the project team created a series of

### USC Health Sciences Campus Community

**79%** Hispanic, **14%** Asian

**34.7yrs** median age, **21%** 0-15 yrs, **12%** > 65 yrs

**15,544** households, **3.6** people per household

**\$48,700** median household income

**71%** of households < **300%** of Federal Poverty Line

**62%** are renters, **38%** homeowners

**28%** spend >**50%** of income on housing

**15%** lack a vehicle

**66%** of residents have lived in area >**10yrs**

scenarios for the City of L.A. outlining where, how many and what kinds of trees could be added to these Eastside neighborhoods.

### Where Could Trees Be Added

The study used a variety of computer analyses and maps to describe conditions as they exist in the study area today: the natural environment; the built environment, including land use, homes, parks, schools and transportation; and the residents, including elements of race, ethnicity, age, income, vehicle access and housing costs relative to people's ability to pay.

Based on these assessments, the researchers created a set of criteria to find the areas of greatest need for new trees. The criteria prioritized areas with:

- a high percentage of young children and elderly,
- low median household incomes,
- high population density and
- large numbers of households with no vehicles, indicating that people rely on walking or public transport to get around.

The research team developed five separate scenarios laying out the most effective places for planting new trees within or next to the selected priority locations.

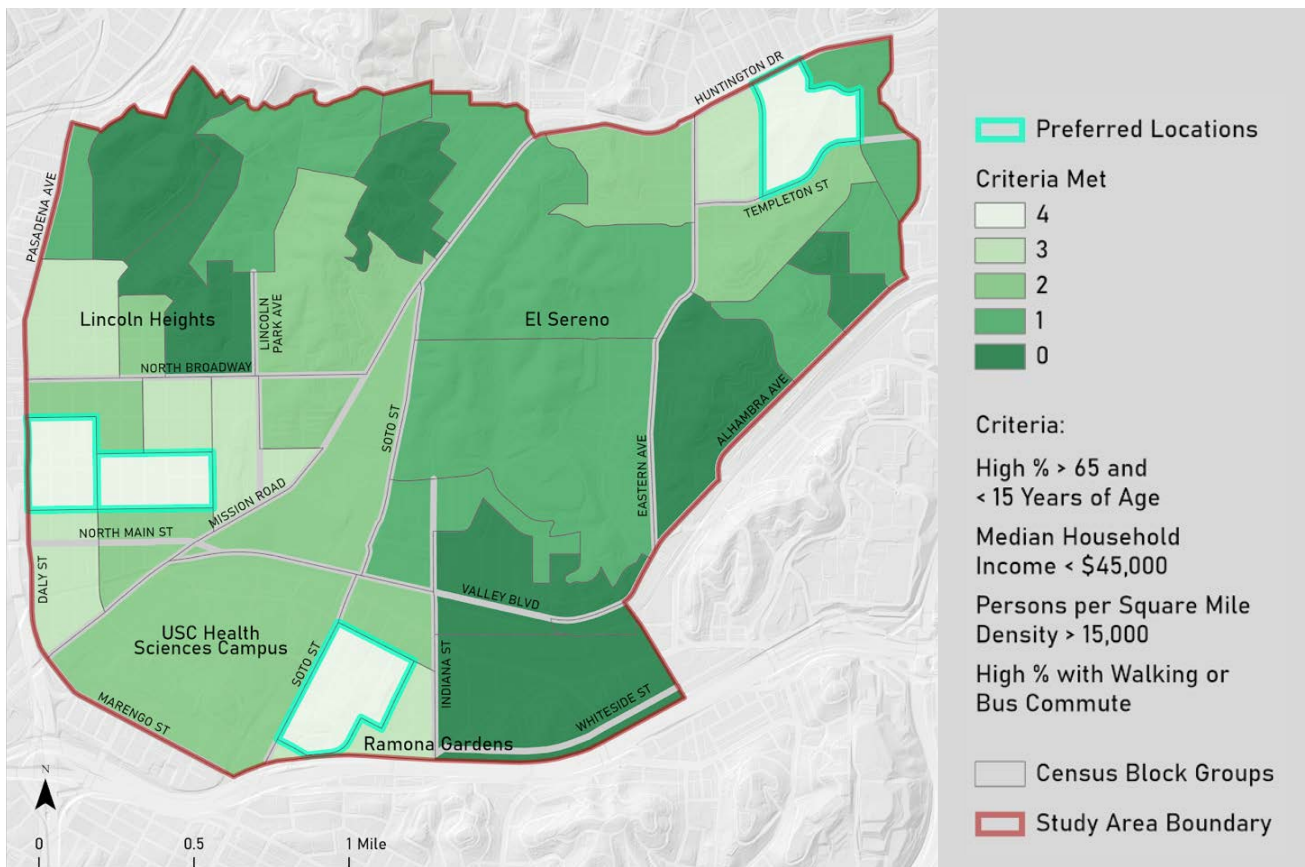
These scenarios include opportunities for planting additional trees:

- on streets with narrow parkways,
- on streets with wide parkways,
- in existing parks,
- at elementary schools and
- in specific settings such as the Ramona Gardens public housing community.

### How Many Trees Could Be Added

The researchers selected two streets, Axtell and Barbee, as examples of what could be achieved on a variety of the parkways found in these neighborhoods. Barbee Street, for instance, could experience an 800% increase in shade coverage through a combination of small and large tree plantings. Adding these trees would require planting on both public and private property, as well as construction on some roads and curbs. Nonetheless, this eightfold increase in shade is just one example of what could be done in an area where there are no trees alongside nearly one-third of the 1,157 streets.

Similarly, parks in these neighborhoods have about six trees per acre — half the average number of trees at parks citywide. The potential to add new trees to parks is particularly significant. In Hazard Park, for instance, the





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researchers estimate there is the potential to add 97 trees to the existing 193 trees. The two largest parks — Ascot Hills and Rose Hills — have more modest tree canopies today and could, like all of the parks, support more tree cover. While planting that many trees at once would be ill-advised because a healthy urban forest needs to have trees of various ages, the project’s findings show that significant increases could be achieved at these sites over time.

The next scenario focused on providing shade covering outdoor areas to reduce surface temperatures at two elementary schools — Murchison and Hillside. Murchison was selected as an example of a relatively large elementary school campus with little tree cover on expansive asphalt playgrounds. Hillside is a smaller campus with less paved area, but pavement still covers a majority of the outdoor space. At Hillside Elementary there is potential to add 50% more trees than the site currently has. On Murchison’s campus the existing number of trees could be doubled.

Lastly, the researchers studied the Ramona Gardens public housing complex, adjacent to Interstate 10, and found that there is room to add 183 trees, a 66% increase. The recommendations target the south and west sides of the buildings and paved areas, to provide cooling for the two-story apartment buildings that lack air conditioning and to remove more pollution from the air. These proposed additions would complement the ongoing work of many local nonprofits focused on adding plants in and around Ramona Gardens.

Each scenario illustrates a different opportunity for tree planting. Collectively, the researchers found that tree canopy could be doubled across much of Lincoln Heights, El Sereno and Ramona Gardens using land available on both public and private property.

### **What Kind of Trees Should Be Added**

Based on predictions that days with extreme heat will increase in the next 40 years, the USC team recommended planting large, dense shade trees that will tolerate hotter, drier conditions.

The team also built a series of mobile sensors to measure air quality in the community. The data they gathered measured the air quality within a tree canopy, among clusters of trees and across neighborhood blocks. While much more of this work is needed, early findings suggest that individual tree species do affect local air quality.

Two evergreen varieties, Cypress and pine trees, show evidence that they remove tiny particles, such as dust and microbes, from the air. Another evergreen species, Deodara

cedar, did not demonstrate any significant ability to trap those particles. Thus, even among evergreens, individual species of trees may affect air quality differently.

Ultimately, these findings provide a springboard for further work. The priority locations and recommended scenarios for planting trees identified by this project help the City of L.A. pinpoint where they should focus such efforts to meet their goal of increasing tree canopy, beginning in low-income heat zones. The City of L.A. and its partners can use the methods developed through the Urban Trees initiative to launch further urban forestry efforts that meaningfully benefit the people of the Eastside, and perhaps other parts of the city, in the immediate future.

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The USC team is made up of faculty experts, students and staff from multiple parts of the university:

- the [USC Dornsife Public Exchange](#), which connects researchers with public and private partners to help solve problems;
- the [USC Dornsife Spatial Sciences Institute](#), which uses spatial analytics, models, and maps to show how we can support sustainable communities;
- the USC Dornsife Carbon Census network, an initiative measuring air quality on the neighborhood scale;
- [USC’s Landscape Architecture program at the School of Architecture](#), a graduate program focusing on how landscape design can help address social issues, and
- [USC’s Office of Community and Local Government Partnerships](#), which works to build stronger communities for the people who live nearby USC campuses.

The City of Los Angeles team includes:

- Rachel Malarich, City lead, City Forest Officer, [Department of Public Works](#)
- Irene Burga, Air Quality Advisor, [Mayor’s Office of Sustainability](#)
- Melinda Gejer, Service Coordinator, [Bureau of Street Services \(StreetsLA\)](#), Department of Public Works
- Amy Schulenberg, Project Coordinator, [LA Sanitation and Environment](#), Department of Public Works
- Rachel O’Leary, Program Director, [City Plants](#), the City’s non-profit tree planting partner

**For more information, visit the**  
[USC Urban Trees Initiative website](#)