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City of Lynwood Tree Canopy Prioritization

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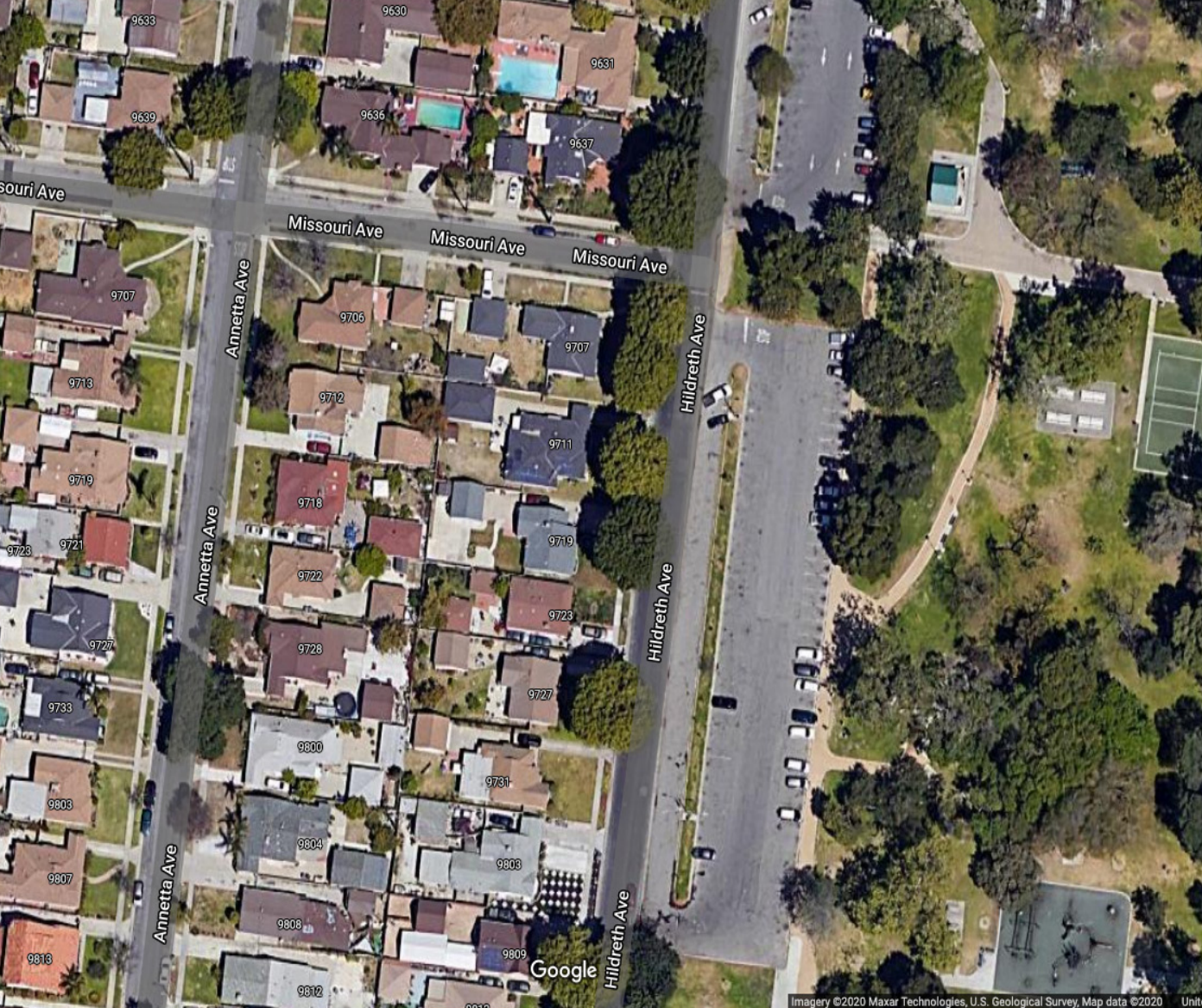
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FINAL REPORT

CITY OF LYNWOOD

TREE CANOPY PRIORITIZATION



Loyola Marymount
University
Center for
Urban Resilience

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AUTHORS & ACKNOWLEDGMENTS

Acknowledgments

This project was a collaboration between the Gateway Cities Council of Governments, the Loyola Marymount University (LMU) Center for Urban Resilience, TreePeople, and the City of Lynwood, and was supported by funding from the California Resilience Challenge and Edison International. Cal Fire will fund the tree planting that follows this report. The parcel-level tree canopy assessment data produced by Galvin et. al (2019) was a fundamental part of this project.

All images are courtesy of project partners or in the public domain.



Thank you, Lynwood!

We are grateful to all of the participants from the City of Lynwood who helped plan and participate in the tree summit. We hope this project helps you in growing Lynwood's urban forest.

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EXECUTIVE SUMMARY

The Loyola Marymount University Center for Urban Resilience (CUREs), TreePeople, and the Gateway Cities Council of Governments partnered to conduct a tree canopy prioritization in the City of Lynwood. This process utilized high resolution, high accuracy tree canopy data as a foundation to engage the public in identifying their priorities for tree planting in the city.

Analysis of tree canopy data acquired through a previous project between CUREs and TreePeople showed that the City of Lynwood has 16% existing tree canopy cover. The analyses also found that Lynwood has great opportunity to increase its tree canopy, with 41% of the land area of the city shown to be Possible Tree Canopy.

The project partners held a series of planning meetings with the City of Lynwood and conducted multiple forms of outreach to engage community participation in two virtual “tree summits,” which took place in December, 2020. Participants were introduced to the numerous ways that their city could benefit from increased tree canopy, engaged in a discussion and several interactive activities about their personal experiences and values around trees, and were invited to take a survey to choose their top ten priorities for tree planting.

Overall, 120 surveys were collected, with the large majority (86%) of respondents indicating that they were residents of Lynwood and a smaller number (24%) indicating that they worked in Lynwood. Respondents had the opportunity to vote to prioritize 22 specific tree benefits across eight categories. Participants identified “Improve Air Quality and Reduce Noise,” “Beautify Neighborhoods,” and “Increase Equity for Residents” as their top priority categories for tree planting. Among the specific benefits, the highest priorities were Air Quality, Replacement Trees, Reduce Heat, Low Tree Canopy, and Schools.

Each of the benefits voted on by participants was associated with a spatial variable (e.g. “Heat” was associated with high-resolution surface temperature data available through NASA). Using the results from the survey, priority weightings were calculated for each spatial variable, and these priorities were mapped using the Possible Tree Canopy data as a guide. Thus, the resulting maps showed the priority locations for tree planting in the City of Lynwood that were already identified by the tree canopy assessment as Possible Tree Canopy.

The results revealed that the highest tree planting priority areas for Lynwood are on the eastern and western edges of the city, corresponding with major transportation corridors. In addition to the maps, tables were produced to provide rankings for each individual parcel in the Possible Tree Canopy boundaries. These datasets include a comprehensive listing of nearly 10,000 Residential Parcels, over 6,000 Road Segments, and 12 Parks in the City of Lynwood.

Together, the products of this tree canopy prioritization project can guide the City of Lynwood in its urban forestry planning. In the near term, TreePeople will use these data to inform the planting of 1,000 trees. In the longer term, the City can use these data to guide future urban forestry strategies. The community-engaged prioritization process served to raise interest and enthusiasm around tree planting in Lynwood, as well as provide the opportunity for community members to provide meaningful input about urban forestry decision-making in their city.

PROJECT OVERVIEW

Background

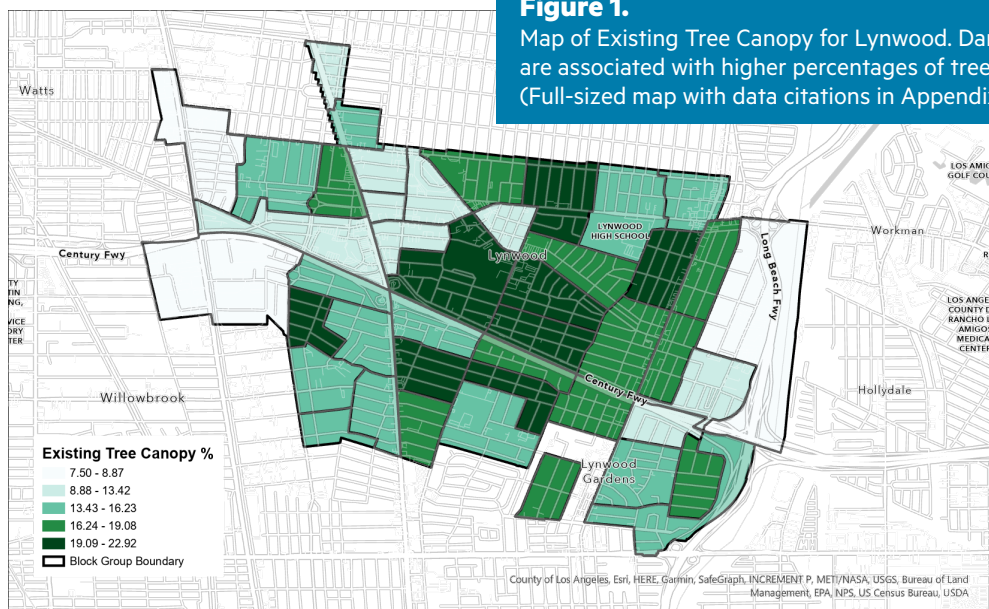
The Gateway Cities in Southeast Los Angeles County is a densely-populated region with many under-resourced, low-income, and transit-dependent residents. This population has increased vulnerability to the extreme heat days and temperatures that are expected to increase with climate change. Urban heat can be mitigated with relatively inexpensive nature-based solutions, allowing residents to continue trends toward increased sustainability and usage of active transportation, while protecting public health and critical infrastructure. For example, TreePeople's Los Angeles Urban Cooling Collaborative found that one in four lives lost during heat waves could be saved in Los Angeles if we strategically increase urban tree canopy and cool surfaces, especially in low-income communities and communities of color (de Guzman et al., 2020).

Urban forestry is one strategy to increase cities' resilience. In addition to reducing the urban heat island effect, urban trees can help prevent flooding and runoff, and remove pollutants before water enters rivers and oceans. Trees filter air pollutants, which can improve air quality and produce public health benefits. Increasing the urban forest has also been associated with socio-economic improvements, such as reduced

crime and improved social interactions (National Research Council 2013).

Many of the benefits that trees provide are correlated with the size and structure of the *tree canopy*, which is the layer of branches, stems, and leaves of trees that cover the ground when viewed from above. Recognizing these benefits, numerous cities have goals to increase tree cover, which often come without implementation plans or considerations of equity. Including community stakeholders in planning and using accurate data to inform decision-making is a way to increase the success of urban forestry programs and thus the resilience of communities.

Loyola Marymount University's Center for Urban Resilience (CUREs), TreePeople, and the Gateway Cities Council of Governments (COG) partnered with the City of Lynwood to conduct a tree planting prioritization process with residents and other city stakeholders. This follows an established approach (Locke et al., 2011) that was first implemented regionally in the City of Commerce in 2019. Participants were able to vote on the benefits of trees most important to them individually, and then this information was compiled to produce a collective map of priority locations for tree planting.



PROJECT OVERVIEW

Tree Canopy Data

Data acquired from the Los Angeles County Tree Canopy Assessment (Galvin, et al. 2019) were used to provide a baseline understanding of the existing and possible tree canopy in Lynwood, CA. This countywide assessment combined 2016 spatial imagery and LiDAR data to produce an 8-category land cover analysis (Figure 2) from which the tree canopy assessment could be derived.

The tree canopy assessment is a parcel-level analysis of both *Existing* (the land currently covered by tree canopy) and *Possible* (the land area where it is possible to plant new trees—excluding roads, buildings, etc.). An example of how this is mapped is shown in Figure 3.

Possible Tree Canopy combines *Possible Vegetated* and *Possible Impervious*. The Possible Vegetated area includes grass and shrub areas where it may be possible to plant new trees, and the Possible Impervious includes asphalt or concrete surfaces, other than roads or buildings, where it may be possible to plant new trees if improvements are made.

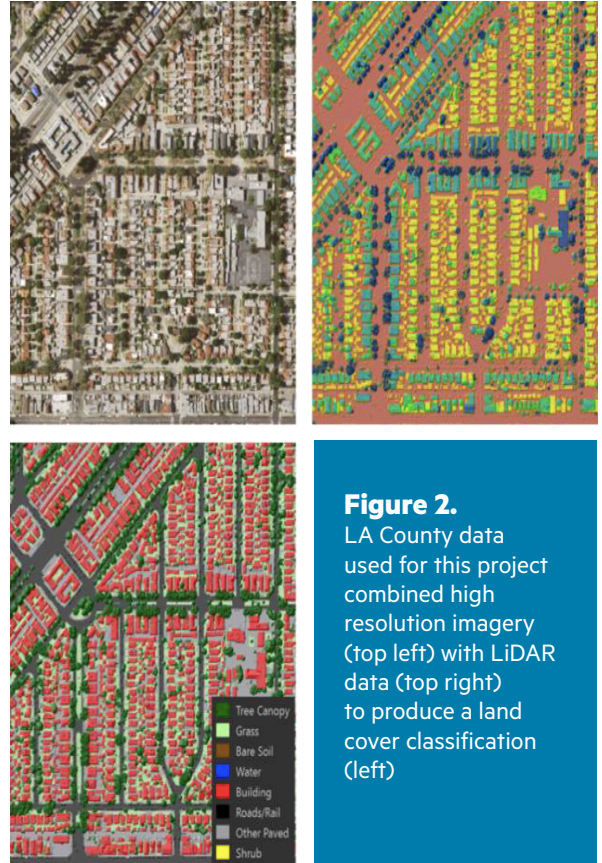


Figure 3. An example of tree canopy cover calculated at the property parcel level



PROJECT OVERVIEW

Tree Canopy and Environmental Justice in Lynwood

The City of Lynwood is located on 4.84 square miles in southeast Los Angeles County, CA. Lynwood has approximately 69,877 residents, with 88.1% of residents identifying as Hispanic or Latino and 8.1% of residents identifying as Black or African American. (U.S. Census Bureau 2019).

The City of Lynwood was transformed from a green suburb to an industrialized city after the construction of I-105 freeway (1993). The City has I-710 freeway on its eastern border, I-105 running west-east through the city, and the Alameda truck corridor on the western border. Vehicular emissions from the freeways and toxins from manufacturing sites exacerbate air quality while the lack of significant canopy and higher area of impermeable surfaces cause the urban heat island impact to be dangerously high. Information from the California Communities Environmental Health Screening Tool (CalEnviroScreen) shows that the majority of Lynwood is classified in the highest categories, 81%-100%, of pollution

burden, meaning that residents of these communities are most affected by many sources of pollution and are especially vulnerable to pollution’s effects (CalEPA OEHHA 2018). Increasing Lynwood’s tree canopy is one way to help mitigate some of the impacts of these environmental burdens.

As shown in Figure 4, Lynwood was found to have 16% of its land area covered by Existing Tree Canopy (see Figure 1), with 41% of the land area found to be Possible Tree Canopy. The remaining 43% of the land area was deemed “not suitable,” meaning that these areas are highly unlikely candidates for tree planting—typically roads, rails, or buildings are found in not suitable areas.

For comparison, at 16% Existing Tree Canopy the City of Lynwood is below the 18% average tree canopy cover found across Los Angeles County. However, it is slightly above the 15% found for the Gateway Cities.

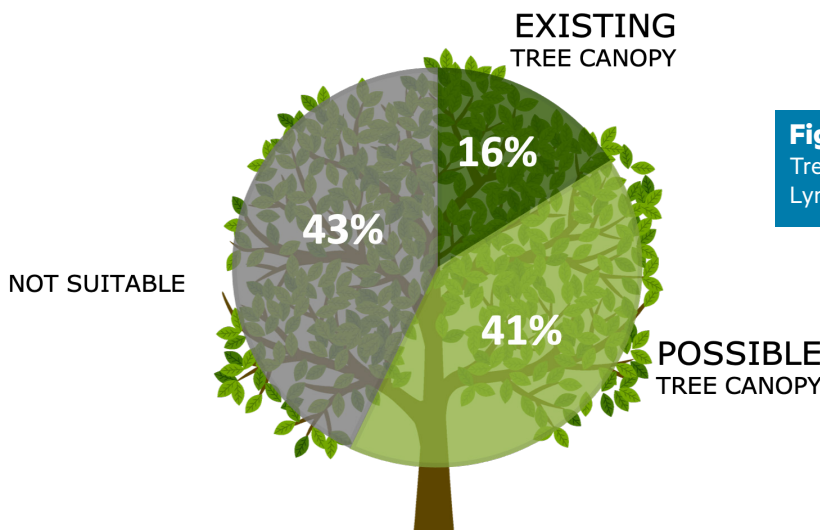


Figure 4. Tree canopy metrics for Lynwood, CA

PROJECT OVERVIEW

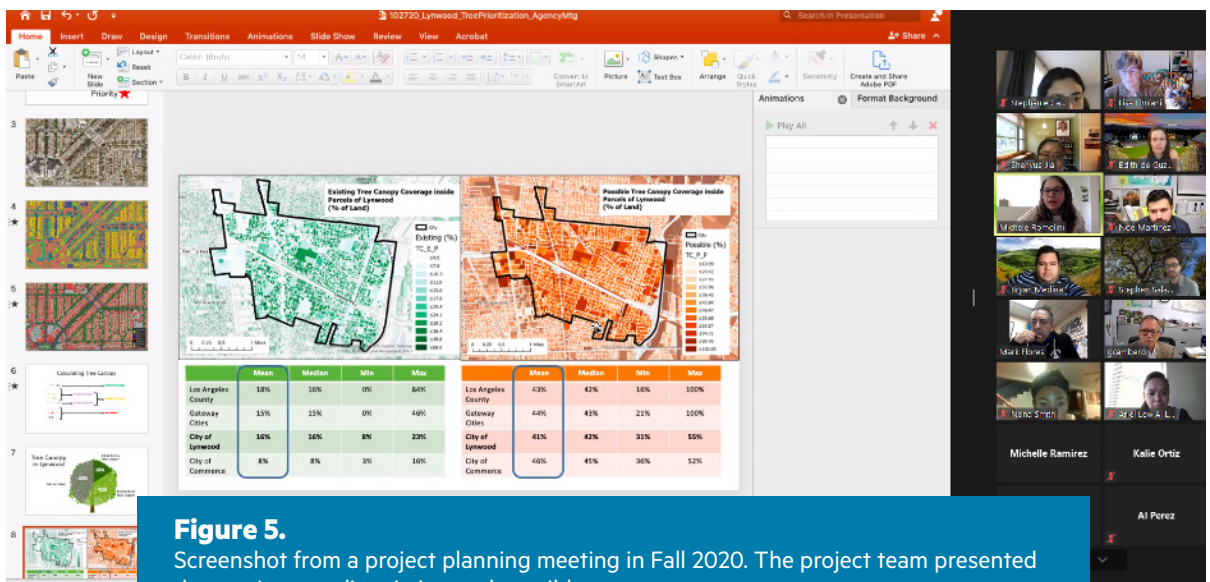
Community-Based Prioritization

The data on Lynwood’s Existing and Possible Tree Canopy provided one layer of information about the urban forest. Given the vast amount of area available for tree planting, it is important to develop priorities to help guide the City in its tree canopy planning. This includes the immediate planting of 1,000 trees by TreePeople in partnership with Lynwood. To help develop these priorities, the project team of LMU CUREs, TreePeople, and the COG partnered with the City of Lynwood to conduct a collaborative tree canopy prioritization process, which consisted of three stages: 1) planning with City partners, 2) a public “tree summit” to gather community input on priority locations for tree planting, and 3) development of maps and a report to the City.

The aim of this process was to engage residents and other stakeholders to provide their input on where the City should prioritize areas for increasing tree canopy based on desired benefits: for example, reduced impervious surface, mitigation of flooding, or vulnerable populations. By combining tree canopy data with other spatial data of interest, each participant was able to choose their personal priorities, and see how those

compared to the priorities of the group. The final map can be used by the City of Lynwood in their decision-making about where to start planting trees. This type of joint knowledge production can contribute to successful implementation of programs and increased community resilience.

To conduct this process, the project team worked closely with the City of Lynwood. Due to the COVID-19 pandemic, all meetings and community engagement occurred virtually (Figure 5). Several meetings were held from September to November 2020 with City staff, including the City Manager, elected officials, and staff representatives from the departments of Recreation, Planning, Public Works, and Public Works. Members of the project team also met with the then Councilmember and current Mayor of Lynwood. The goals of these meetings were to better understand the history of urban forestry in Lynwood; to gain insight on the urban forestry goals and current priorities; and to hear any concerns or other information that could help guide the project. The content of these meetings served to inform development of community engagement plans, including the public survey.



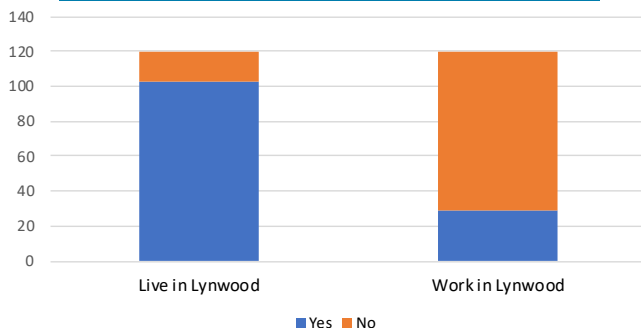
STUDY FINDINGS

Participant Characteristics

There were 24 attendees of the virtual tree summits. Participants in the summits were encouraged to share the informational website and survey link with others in their community, and the survey was also promoted through the Lynwood website and the social media of the project team. This led to a total of 120 respondents to the Lynwood Tree Canopy Survey.

Of the 120 survey respondents, 103 (86%) live in Lynwood, and 29 (24%) work in Lynwood (Figure 7). A subset of those who work in Lynwood identified their employer; these included the City of Lynwood, Lynwood Council, Lynwood Unified School District, Keller Elementary School, Lindbergh Elementary School, Lynwood High School, Lynwood Rotary Club, and Advanced Labs. Several wrote in their place of employment outside of Lynwood, including East Yards Communities for Environmental Justice,

Figure 7. Survey respondents' relationship to Lynwood.



California Youth Connection, and Keck Medicine of USC Hospital. There were also 18 youth respondents who indicated they were Lynwood high school students, representing 15% of the total participation.

Six respondents either did not answer the live and work questions or responded that they did not live or work in Lynwood but had an interest in the city's tree planting efforts.

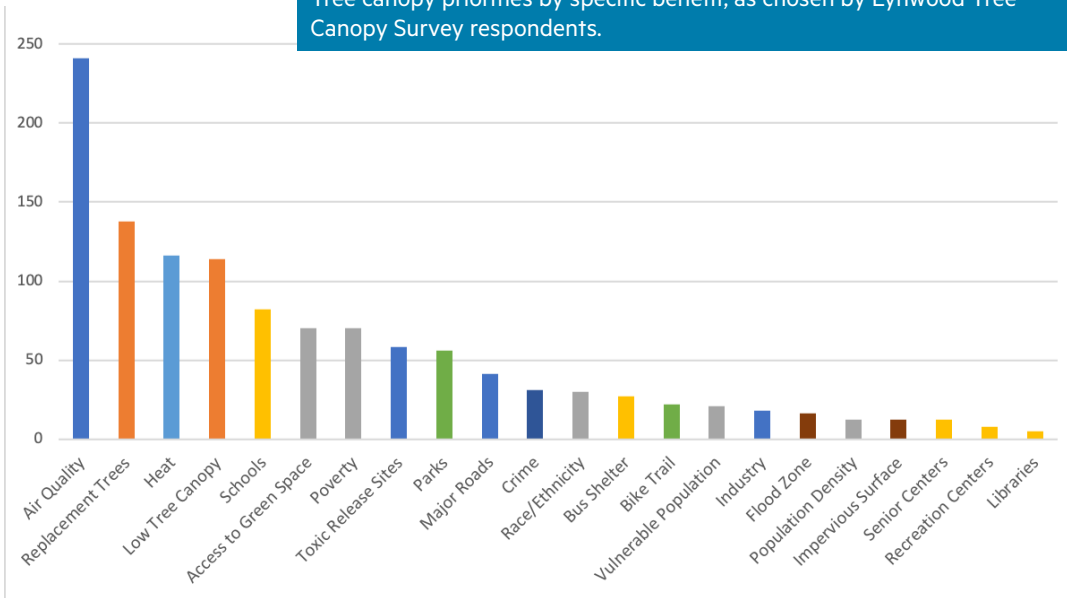
Tree Planting Priorities - Survey

Participants were given a list of 22 possible tree benefits to choose from when identifying their priorities for tree planting. The benefits listed were not a comprehensive list of all the possible benefits of trees; rather, they were carefully chosen for their applicability to the City of Lynwood. Criteria for inclusion were that 1) the item listed would address a social or environmental challenge faced by residents, and 2) the item listed was able to be mapped at a fine resolution so that priorities could be calculated and shown on maps. The 22 benefits were grouped into 8 categories: Beautify Neighborhoods, Improve Air Quality and Reduce Noise, Increase Equity for Residents, Prevent Flooding and Increase Infiltration, Promote Recreation Opportunities, Protect Critical Community Places, Reduce Crime, and Reduce Heat (see Figure 8 and Appendix).

I Want to Plant Trees To...	Specifically, I Want to Improve...	This Means the Tree Planting Team Will...
Beautify Neighborhoods	Low Tree Canopy	Plant trees on streets with few or no street trees, to beautify the neighborhood.
	Replacement Trees	Plant trees to replace those removed for development, damage and/or City capital improvement projects.
Improve Air Quality & Reduce Noise	Air Quality Index	Plant trees in areas with the poorest air quality scores to help improve the air quality.
	Major Roads	Plant trees near major roads to help reduce the impacts of the air pollution and noise.

Figure 8. Examples of tree planting priorities that could be chosen by Lynwood Tree Canopy Survey respondents.

Figure 9. Tree canopy priorities by specific benefit, as chosen by Lynwood Tree Canopy Survey respondents.



Each participant was given 10 votes, and these could be distributed however the survey taker deemed appropriate. Thus, all 10 votes could be used for one benefit, the votes could be evenly distributed among 10 separate benefits, or some combination therein (for example, 2 votes for Schools, and 1 vote each for Low Tree Canopy, Air Quality, Major Roads, Industrial Activities, Poverty/Low Income, Flood Zone, Crime, and Heat).

When the survey results were analyzed by *specific benefit*, results from the 120 surveys showed that participants most frequently identified Air Quality as the highest priority. This is followed

by Replacement Trees, Reduce Heat, Low Tree Canopy, and Schools. Figure 9 shows how the specific benefits were prioritized.

When summarizing by *category*, the priorities are ordered differently. The highest priority for tree planting was Improve Air Quality and Reduce Noise. Thirty percent of the votes were in this category (Figure 10). This was followed by Beautify Neighborhoods with 21% of the votes, Protect Critical Community Places (17%), Increase Equity for Residents (16%), Reduce Heat (9.5%), Promote Recreation Opportunities (6.5%), Reduce Crime (2.5%), and Prevent Flooding and Increase Infiltration (2.5%).

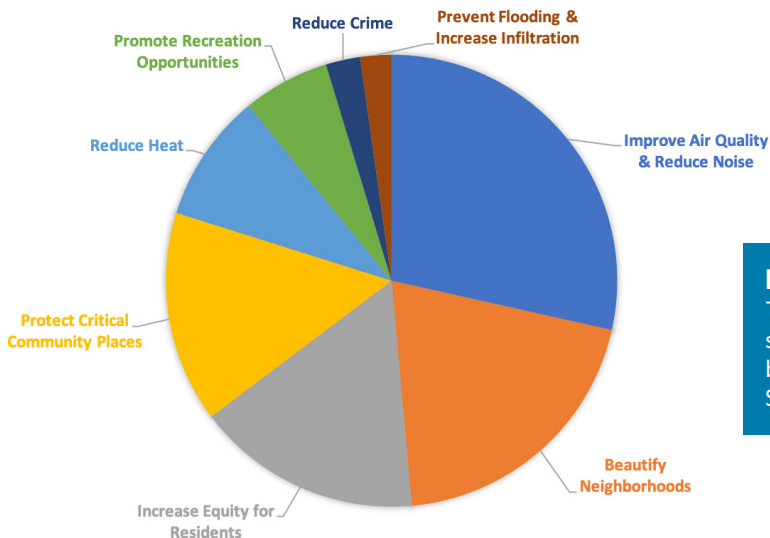


Figure 10. Tree canopy priorities by specific benefit, as chosen by Lynwood Tree Canopy Survey respondents.

STUDY FINDINGS

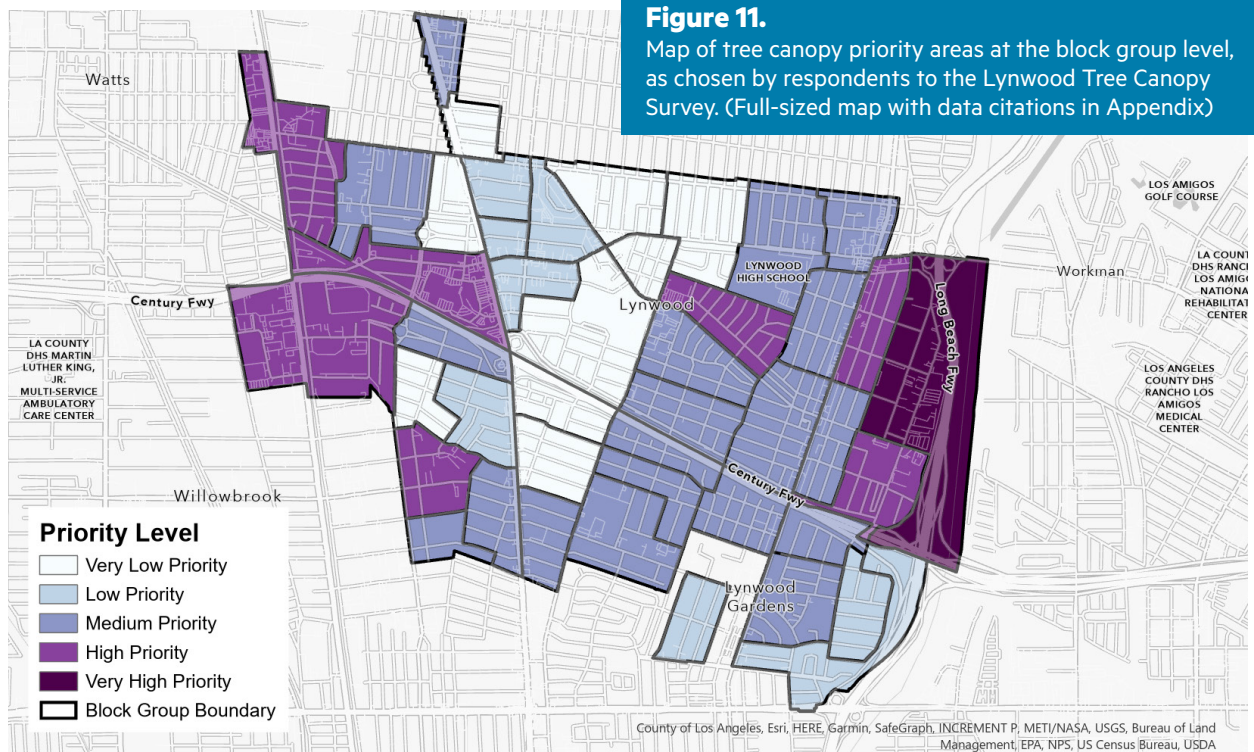
Tree Planting Priorities - Mapping

The priority data collected from the survey were then combined with the tree canopy data to develop maps and tables of priority locations for planting. As mentioned in the previous section, each priority had an associated spatial variable that could be mapped at a fine resolution. Data were acquired for each of these variables. For example, for Heat, surface temperature data was acquired from NASA’s ECOSTRESS program. For Replacement Trees, the City of Lynwood’s Public Works Department provided their list of trees removed from public property for capital improvement projects.

Each variable was given a different weighting to account for the information gathered from the survey. Air Quality was weighted the highest and Libraries was weighted the lowest. The weighted priority variables were processed in an ArcGIS model to produce a map of areas where tree summit participants collectively prioritized to plant trees. Figure 11 shows the overall priority

map for increasing Lynwood’s tree canopy. As shown, this analysis placed the very highest priority for planting trees on the eastern edge of the city, with most of the remaining high priority areas on the western edge. This aligns with the locations of the I-710 freeway and the Alameda truck corridor, and reflects the high priority placed on improving the air quality impacted by those major thoroughfares.

This priority map can be used alongside the Possible Tree Canopy map (Figure 1) to determine best places for tree planting. In addition to the maps, three separate tables were created to provide a comprehensive listing of the priority planting locations for Residential Parcels, Road Segments, and Parks in the City of Lynwood. These are provided as Excel files along with this report (see Appendix) and can guide both the upcoming TreePeople planting as well as future plantings by the City.



STUDY FINDINGS

Additional Survey Results

A final section of the survey asked participants about their perceptions of tree policies and management in the City of Lynwood. Respondents were asked whether they agreed with a series of statements on a scale from 1 to 5, where 1 was strongly agree and 5 was strongly disagree.

For the statement “It is a priority to me that the city should make Lynwood greener by planting more trees,” 76% strongly agreed, 19% somewhat agreed, and the remaining 5% were neutral or disagreed.

For the statement, “I believe there are barriers to planting trees in my neighborhood/city,” 53% strongly or somewhat agreed, 32% neither agreed nor disagreed, and 15% strongly or somewhat disagreed.

For the statement, “I believe there are barriers to taking care of trees in my neighborhood/city,” 57% strongly or somewhat agreed, 27% neither agreed nor disagreed, and 16% strongly or somewhat disagreed.

Those who agreed that there were barriers were asked to list up to three potential barriers to tree planting and care in Lynwood, which fell into five broad categories: 1) Resident Responsibility/Perceptions, 2) City Responsibility, 3) Infrastructure/Physical Environment, 4) Funding, and 5) Specific Sites. See Box 1 for details of these categories.

Participants also provided final remarks, which are provided in the Appendix for review.

Box 1. Barriers to Tree Planting & Care

When asked to list potential barriers to tree planting and care in Lynwood, responses fell into five categories, as follows:

1. Resident Responsibility/Resident Perceptions

These identified barriers were related to resident’s behaviors or perceptions regarding trees, such as “People don’t take care of them,” “Trees sometimes grow very big and make a lot of trash and neighbors don’t like it,” and “Not enough knowledge on care and maintenance.”

2. City Responsibility

These identified barriers were related to the city’s actions regarding trees, such as “Poor maintenance from the city in low income areas,” “Trees are not a priority and important to the city,” and “Lack of leadership.”

3. Infrastructure/Physical Environment

These identified barriers were related to the existing physical environment and how trees may impact that environment, such as “Damage to sidewalks,” “Not enough space,” “Lots of concrete,” and “Power lines.”

4. Funding

These identified barriers included funding barriers at the individual or city level, including “Maintenance costs,” “Resident can’t afford to take care of tree,” and “Budget.”

5. Specific Sites

Many respondents identified specific sites as barriers to tree planting and care, such as “Schools,” “Vacant lot,” “LA River,” and “Louise Avenue.”

SUMMARY & NEXT STEPS

Success of the Prioritization Process

The prioritization process highlighted the importance of trees to the participating residents and the elected officials and staff of the City of Lynwood. This was evident in the City's strong support, partnership, and promotion of this project, which was underscored by the participation of Lynwood Mayor Marisela Santana in both tree summits.

More than 75% of the survey respondents agreed that "it is a priority to me that the city should make Lynwood greener by planting more trees." During the virtual events, residents shared their personal stories about trees and their vision for Lynwood's urban forest, through interactive mapping and other activities.

They were then able to vote on their priorities for the city's tree canopy, choosing the benefits of trees most important to them as listed on the Lynwood Tree Canopy Survey. Participants were excited to have the opportunity to provide meaningful input that would be used to guide TreePeople in planting 1,000 trees in their city, as well as to influence the City's longer term urban forestry efforts.

Participant feedback was extremely positive about the events, and an additional 96 people took the survey after the summits. This included a large youth representation, largely from Lynwood High School students.



Figure 12.

The support of Mayor Marisela Santana (right) helped make the Lynwood tree canopy prioritization project successful. Photograph by Adam Corey Thomas, courtesy of TreePeople.

SUMMARY & NEXT STEPS

Urban Forestry Policies

A majority of respondents agreed that there are barriers to tree planting and tree care in Lynwood. Survey responses were mixed in indicating city and resident responsibility in contributing to these barriers. Resident (mis)perceptions and the need for education were identified as barriers, especially to care and maintenance. Respondents also described barriers that are not necessarily under the city’s control, such as physical barriers and financial barriers.

Collectively, survey respondents chose “replacement trees” among the highest priorities for tree canopy in the City of Lynwood, second only to air quality. City representatives shared with the project team that their approach to replacing trees is “remove one, plant one.” While this is a common replacement ratio in urban forestry policies, it is not ideal, as a newly planted tree can take several decades to grow a fully mature canopy and provide the benefits of the previous, mature tree. To maintain the services provided by their urban tree canopy, Lynwood may benefit from revising their ordinances to incorporate adjustments for the size of the tree removed and other considerations.

The City of Lynwood may also consider undergoing the process of creating an Urban Forestry Management Plan (UFMP) to guide their future urban forestry efforts. The State of California provides guidance for urban forestry and forest health and annual CAL FIRE grants of up to \$1.5 million are available to municipalities through CAL FIRE to develop UFMPs (though the current funding cycle is paused due to budget delays). Both CUREs and TreePeople have experience working with cities to propose and develop these plans and stand ready to continue working with the City of Lynwood on urban forestry planning and policies.

Box 2. Resources for Next Steps

- [This report from San Mateo County’s Tree Ordinances Steering Committee](#) provides detailed policy options
- [The State of California provides guidance and funding through CAL FIRE](#) for municipalities to develop Urban Forestry Management Plans





Next Steps

This report shows that there is great opportunity for the City of Lynwood to increase its urban forest. Analysis of the tree canopy data showed that 41% of the land area of the city may be feasible for planting trees. Through the community-based prioritization process, it was found that the highest priority areas for planting are located in the eastern and western edges of the city. This spatially represents the most chosen benefits of trees for survey participants, including Air Quality, Replacement Trees, Reduce Heat, Low Tree Canopy, and Schools. It is notable that the western edge of the city was not nearly as prominent in the Tree Summit mapping exercise in which attendees placed pins on the map where they wanted trees (Figure 5a). This may indicate a lack of representation in the summits from people living or working in the western areas of the city, and may be a focus of follow-up community engagement.

In the immediate term, the results can help inform the planting of 1,000 trees through a Cal Fire grant secured by TreePeople in 2020 in partnership with the City of Lynwood. An additional 200 fruit trees will be given away to residents to plant on their properties, including to those who attended the tree summits. This information was provided at the Tree Summit, which enabled participants to provide feedback with the knowledge that it would have an immediate impact in guiding tree planting efforts

in Lynwood. The community engaged process also served to help TreePeople gain community feedback and support before planting the trees. Participants were encouraged to get involved by volunteering with TreePeople's future tree plantings in Lynwood.

In the longer term, this report and the associated tools can aid in furthering urban forestry planning and initiatives in the city. Additionally, Lynwood's prioritization is part of a regional effort by the project team to conduct prioritizations in the cities of Commerce, Paramount, Vernon, and Montebello. The work in Lynwood will only be strengthened by being part of this Gateway Cities initiative.

The prioritization approach allowed for the use of a high resolution, high accuracy assessment of tree canopy in the City of Lynwood as a foundation of a data-driven community engagement process. This helped to increase community awareness of the importance of urban trees; involve residents and other stakeholders in decision-making regarding the urban forest; and provide maps and other information that can support the city to grow its urban forest. Together, this approach can contribute to a greater sense of stewardship for the trees in Lynwood and have an impact on the long-term success and resilience of urban forestry efforts.

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SPATIAL DATA CREDITS

ESRI Living Atlas

Los Angeles County GIS Portal

Los Angeles Regional Imagery Acquisition Consortium (LARIAC)

NASA SEDAC

SavATree Consulting Group

SCAG Open GIS Portal

University of Vermont Spatial Analysis Laboratory

US Census American Community Survey

APPENDIX

1. Project Team Biographies
2. Map of Existing Tree Canopy in Lynwood
3. Map of Possible Tree Canopy in Lynwood
4. Overall Tree Canopy Priority Map for Lynwood
5. Lynwood Tree Canopy Survey
6. Survey Respondents' Final Remarks

ELECTRONIC ATTACHMENTS

Tables of Priority Parcels for Tree Canopy in Lynwood

KMZ Spatial Data Layer of Prioritization



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