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# City of Montebello Tree Canopy Prioritization

Center for Urban Resilience

TreePeople

Gateway Cities Council of Governments


**FINAL REPORT**

# CITY OF MONTEBELLO TREE CANOPY PRIORITIZATION

Loyola Marymount University
Center for Urban Resilience

SEPTEMBER 2022

# Contents

# 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 Montebello, and was supported by funding from the California Resilience Challenge and Edison International. 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, the City of Montebello's website, or the public domain.

**Thank you, Montebello!**

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

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1 Please see Appendix for expanded project team list

# EXECUTIVE SUMMARY

The Loyola Marymount University Center for Urban Resilience, TreePeople, and the Gateway Cities Council of Governments partnered to conduct tree canopy prioritization in the City of Montebello. 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 showed that the City of Montebello has 13% existing tree canopy cover, which the lowest tree canopy cover in all of Los Angeles County. The analyses also found that Montebello has great opportunity to increase its tree canopy, with 48% 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 Montebello and conducted outreach to engage City staff, residents, and other stakeholders of Montebello. One event was a "Montebello community roundtable," which took place on June 16, 2022 a via Zoom. Participants were presented with the numerous ways that their city could benefit from increased tree canopy, engaged in a discussion and 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.

There were 36 respondents to the Montebello Tree Canopy Survey, with 83% of respondents indicating that they were residents of the City of Montebello, and 50% indicating that they work in the City. Respondents had the opportunity to vote to prioritize 20 specific tree benefits across seven categories. Participants identified Beautify Neighborhoods and Promote Outdoor Activities (34%) and Improve Air Quality and Reduce Noise (30%), and Increase Equity for Residents (16%) as their top priority categories for tree planting. Among the specific benefits, the highest priorities were Air Quality, Low Tree Canopy, Park Improvement, Reduced Heat, and Access to Green Space. 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 at the parcel level. These rankings were mapped to provide a visual of where participants' combined priorities are located. The results revealed that the highest tree planting priority areas for Montebello were in the the central parts of the city. The lowest priority areas were mostly located in the northeastern part of the city. In addition to the maps, tables were produced to provide rankings for each individual parcel in the Possible Tree Canopy boundaries. This dataset includes a comprehensive listing of over 13,000 parcels in the City of Montebello, along with their priority score and percent of existing tree canopy.

The survey also asked participants about their perceptions of tree planting and care in Montebello. There were 94% who agreed that planting more trees is a priority, though 61% believed there are barriers to planting and 64% recognized that there are barriers to taking care of the trees in Montebello; in particular, barriers related to City Policies & Responsibilities, Community Knowledge & Responsibility, and Infrastructure/Physical Environment.

This project can help guide the City of Montebello in future urban forestry strategies. The City may look to focus their tree planting efforts in high priority locations that are on public lands, especially in conjunction with the Montebello Parks Master Plan. The City may also consider educational campaigns and incentives to reach out to specific landowners to increase tree canopy on private lands. Finally, the City may wish to develop new urban forestry policies and could consider pursuing funding programs to support a Montebello Urban Forest Management Plan.

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 experiences increased vulnerability to extreme heat days and temperatures that are expected to accelerate 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 (Figure 1). Increasing the urban forest has also been associated with socio-economic improvements, such as reduced crime and improved social interactions (NRC 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, TreePeople, and the Gateway Cities Council of Governments partnered with the City of Montebello to conduct a community-based tree planting prioritization process with residents, business owners, and other city stakeholders. This follows an established approach (Locke et al. 2011) that has previously been implemented in the Cities of Commerce, Lynwood, Paramount, and Vernon (LMU CURes & TreePeople 2019, LMU CURes et al. 2020, 2021, 2022). 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.


**Figure 1.**
Screenshot from a virtual community tree canopy prioritization event. Project partners presented the health beneifts of trees.

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. 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 2.**
LA County data used for this project combined high resolution imagery (top left) with LiDAR data (top right) to produce a land cover classification (left)

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

PROJECT OVERVIEW

# Montebello's Environment

The City of Montebello is located on 8.4 square miles in southeast Los Angeles County, CA. The City of Montebello has a population of approximately 63,000, but only 1.3 acres of available recreational space per 1,000 people, compared to 8.1 acres for LA County. Montebello is surrounded by the major Interstate highways of I-5, I-60, and I-605. These transportation corridors contribute to severe congestion and idling in the community. The City is also home to one currently active Superfund site and has 710 oil and gas wells (2017 data).

Information from the California Communities Environmental Health Screening Tool (CalEnviroScreen 4.0) shows that the majority of Montebello's Census tracts are classified between 90-100 in pollution burden, where 100 is the maximum pollution burden a community can receive. This means that in many areas of the City, residents, workers, and visitors of Montebello are affected by multiple sources of pollution and are especially vulnerable to pollution's effects (CalEPA OEHHA 2021).

Increasing Montebello's tree canopy is one way to help mitigate some of the impacts of environmental burdens.

One opportunity is in City parks. Although the City of Montebello has a low ratio of recreational space per 1,000 people, a relatively high percentage (60%) lives within a half-mile of a park, compared with 49% countywide. The City recently partnered with planning firm KTUA, who completed a needs assessment and master plan for Montebello's parks in 2021. Some of the recommendations include infill of existing City parks and the creation of new pocket parks and linear trails/green corridors (Figure 4). When implemented, the City should take care to preserve existing mature trees as well as identify new places to expand tree canopy on public land.

**Figure 4.**
Rendering of a recommended Rio Hondo linear trail from the Montebello Parks Master Plan. (City of Montebello, 2021)

PROJECT OVERVIEW

# Montebello's Tree Canopy

As shown in Figure 5, Montebello was found to have 13% of its land area covered by Existing Tree Canopy. For comparison, the County of Los Angeles was found to have 18% average tree canopy cover and the Gateway Cities were found to have 15% average tree canopy cover.

The analysis also showed that 39% of the land area was deemed "not suitable," meaning that tree planting cannot occur—typically roads, rails, or buildings are found in not suitable areas. The remaining 48% of the land area was found to be Possible Tree Canopy. Figure 6 shows how the Existing and Possible Tree Canopy areas are distributed throughout Montebello.

**Figure 5.**
Tree canopy metrics for Montebello, CA

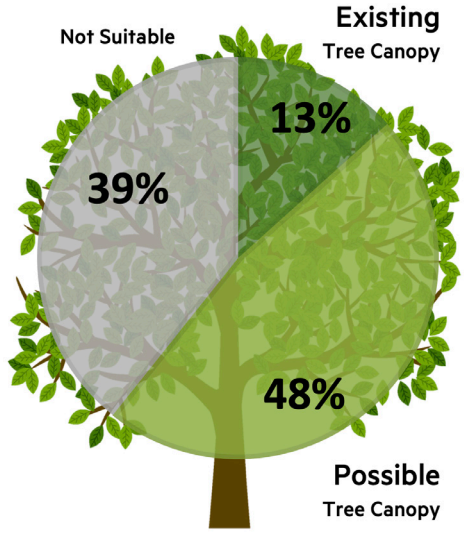
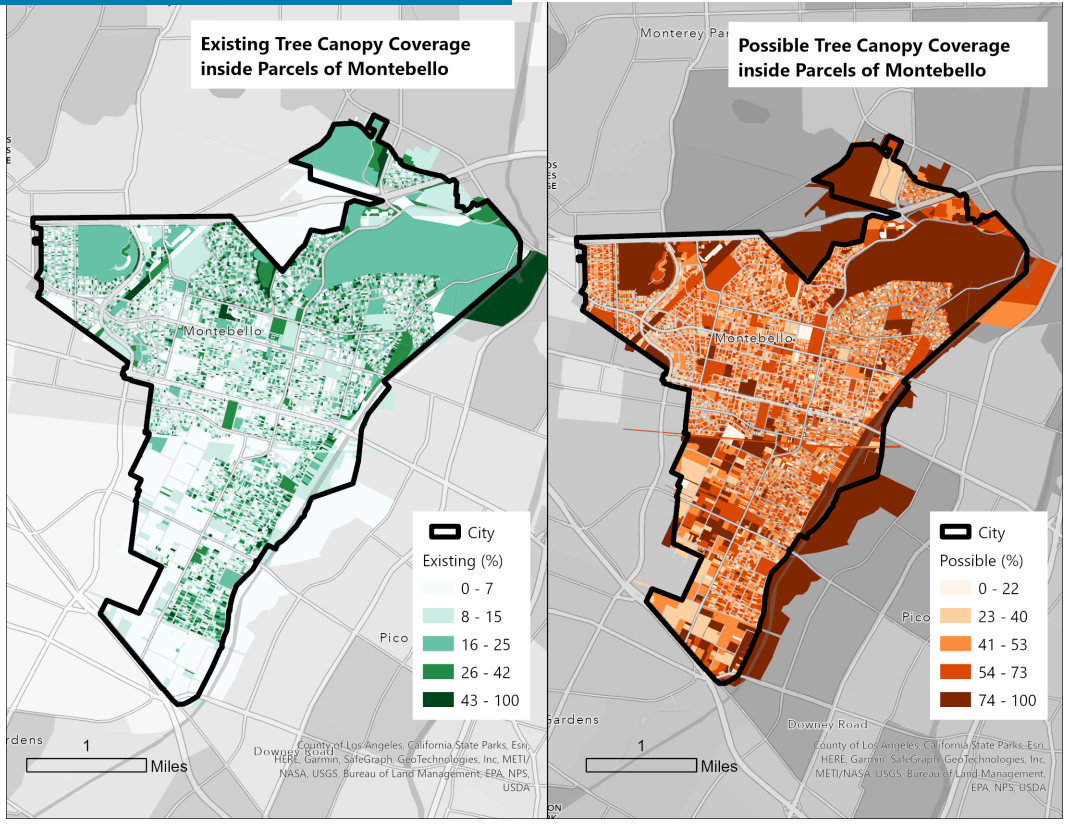



**Figure 6.**
Map of Montebello showing Existing (left) and Possible (right) Tree Canopy throughout the city.



PROJECT OVERVIEW

# Community-Based Prioritization

The data on Montebello's Existing and Possible Tree Canopy provided one layer of information about the urban forest. To help the City of Montebello develop priority locations for future tree planting, the project team of LMU CURes, TreePeople, and the COG partnered with the City to conduct a collaborative tree canopy prioritization process, which consisted of three stages: 1) planning with City partners, 2) public outreach, including a "community roundtable" to gather 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 Montebello in their decision-making about where to plant future 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 Montebello. All meetings and most community engagement occurred virtually. Two meetings were held in April and May 2022 with City staff from the department of Public Works. The goals of these meetings were to better understand Montebello's 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 and the Montebello Tree Canopy Survey.

Community engagement included outreach via social media outlets and a free fruit tree distribution event (Figure 7). The Montebello community roundtable event was held at City Hall and via Zoom on June 16, 2022.

**Figure 7.**
Montebello residents taking home fruit trees.

PROJECT OVERVIEW

# Montebello Tree Canopy Event

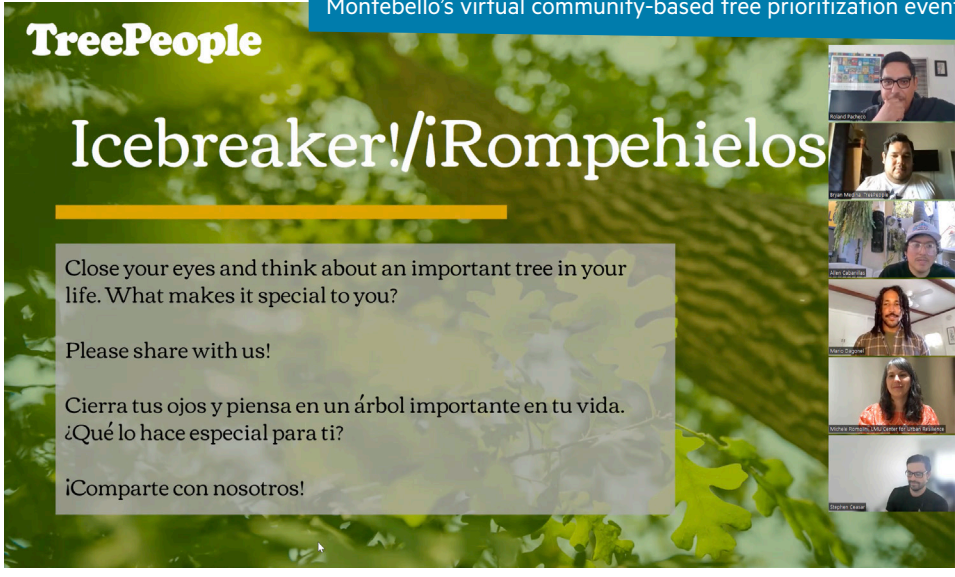
The public tree canopy event was held on the evening of June 16, 2022 via Zoom. Project partners promoted the events through their websites and social media channels, and TreePeople offered a free fruit tree to those who attended to incentivize attendance. The tree summit was led by TreePeople and LMU CURes. The goals of the event were to introduce the project to the public, to discuss the value and benefits of tree canopy, and to survey participants on their priorities for increasing tree canopy in Montebello. Interactive components included an icebreaker in which participants were given the opportunity to identify an important tree in their life (Figure 8), a real-time word cloud exercise asking "what should we consider when choosing where to plant tree?" and a Q&A .

Participants were directed to the Montebello Tree Canopy Survey, where they could choose their priorities for tree planting (Figure 9). Members of the project team were available to answer any questions for the approximate 5-10 minute duration of the survey. The tree canopy survey was offered in both English and Spanish. The full survey can be found in the Appendix.

**Figure 9.**
Sample of the list of tree planting priorities that could be chosen by Montebello Tree Canopy Survey respondents.

| I Want to Plant Trees To... | Specifically, I Want to Improve... | This Means the Tree Planting Team Will... |
|---|---|---|
| Beautify Neighborhoods & Promote Outdoor Activities | Low Tree Canopy | Plant trees on streets with few or no street trees, to beautify the neighborhood & provide shade for pedestrians. |
| | Park Improvement | Plant trees in parks to promote community recreation and health. |
| | Pedestrian & Bicycle Routes | Plant trees along pedestrian and bicycle routes to promote active transportation and community health. |

**Figure 8.**
Montebello's virtual community-based tree prioritization event.



STUDY FINDINGS

# Priorities Identified by Participants

The Montebello Tree Canopy Survey received 36 responses. Thirty (83%) of the respondents were residents and 50% of the respondents worked in the City of Montebello.

Participants were given a list of 20 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 chosen for their applicability to the City of Montebello.

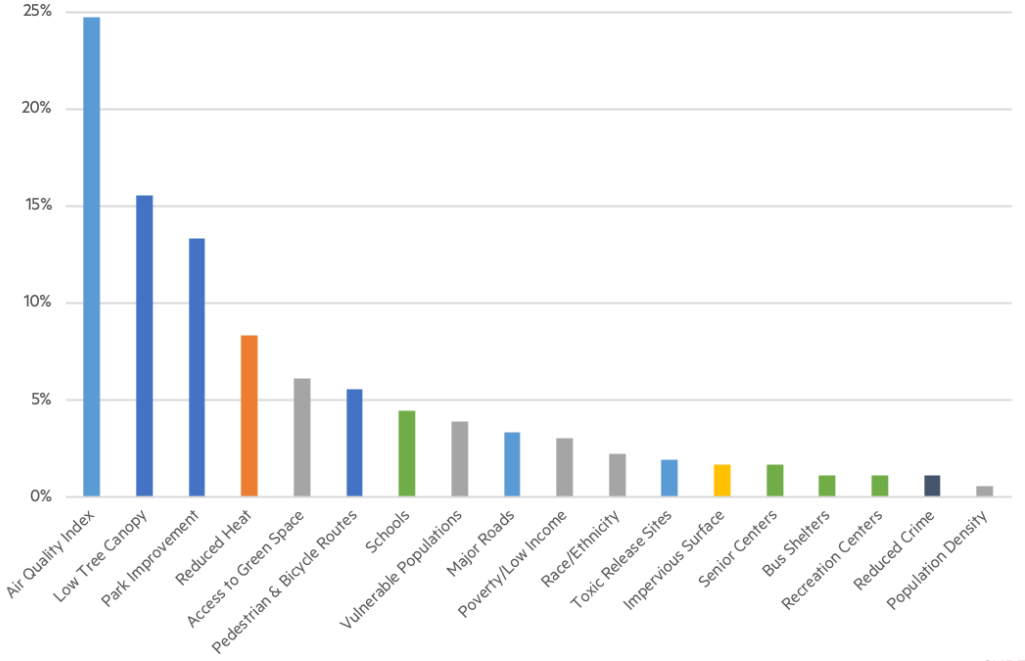
Criteria for inclusion were that:
1) The item listed would address a social or environmental challenge faced by those living or working in Montebello.
2) The item listed was able to be mapped at a fine resolution so that priorities could be calculated and shown on maps.

The 20 benefits were grouped into 7 categories: Beautify Neighborhoods & Promote Outdoor Activities, Improve Air Quality & Reduce Noise, Increase Equity for Residents, Prevent Flooding & Increase Infiltration, Protect Critical Community Places, Reduce Crime, and Reduce Heat (see Appendix for full survey).

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.

When the survey results were analyzed by *specific benefit*, survey responses showed that participants most frequently identified Air Quality as the highest priority, with 25% of the votes going to this category. This is followed by Low Tree Canopy (16%), Park Improvement (13%), Reduced Heat (8%), and Access to Green Space (6%). Figure 10 shows how the specific benefits were prioritized.

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



## STUDY FINDINGS

Note that two potential priorities, Industrial Areas and Libraries, received less than 1% of votes and do not appear in Figure 10.

When summarizing by *category*, the priorities follow a similar pattern (figure 11). The highest priorities for tree planting were Beautify Neighborhoods and Promote Outdoor Activities (34%) and Improve Air Quality and Reduce Noise (30%). These were followed by Increase Equity for Residents (16%), Reduce Heat (8%), Protect Critical Community Places (8%), Prevent Flooding & Increase Infiltration (2%), and Reduce Crime (1%).

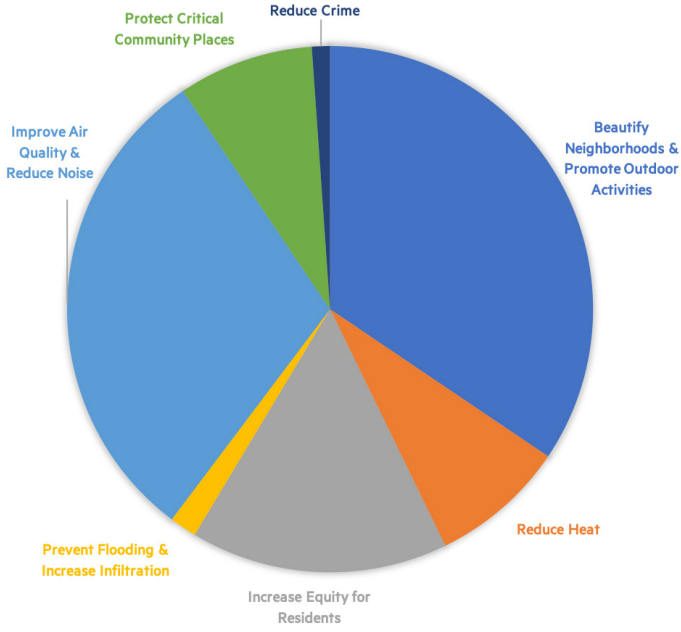



**Figure 11.**
Tree canopy priorities by category, as chosen by Montebello Tree Canopy Survey respondents.

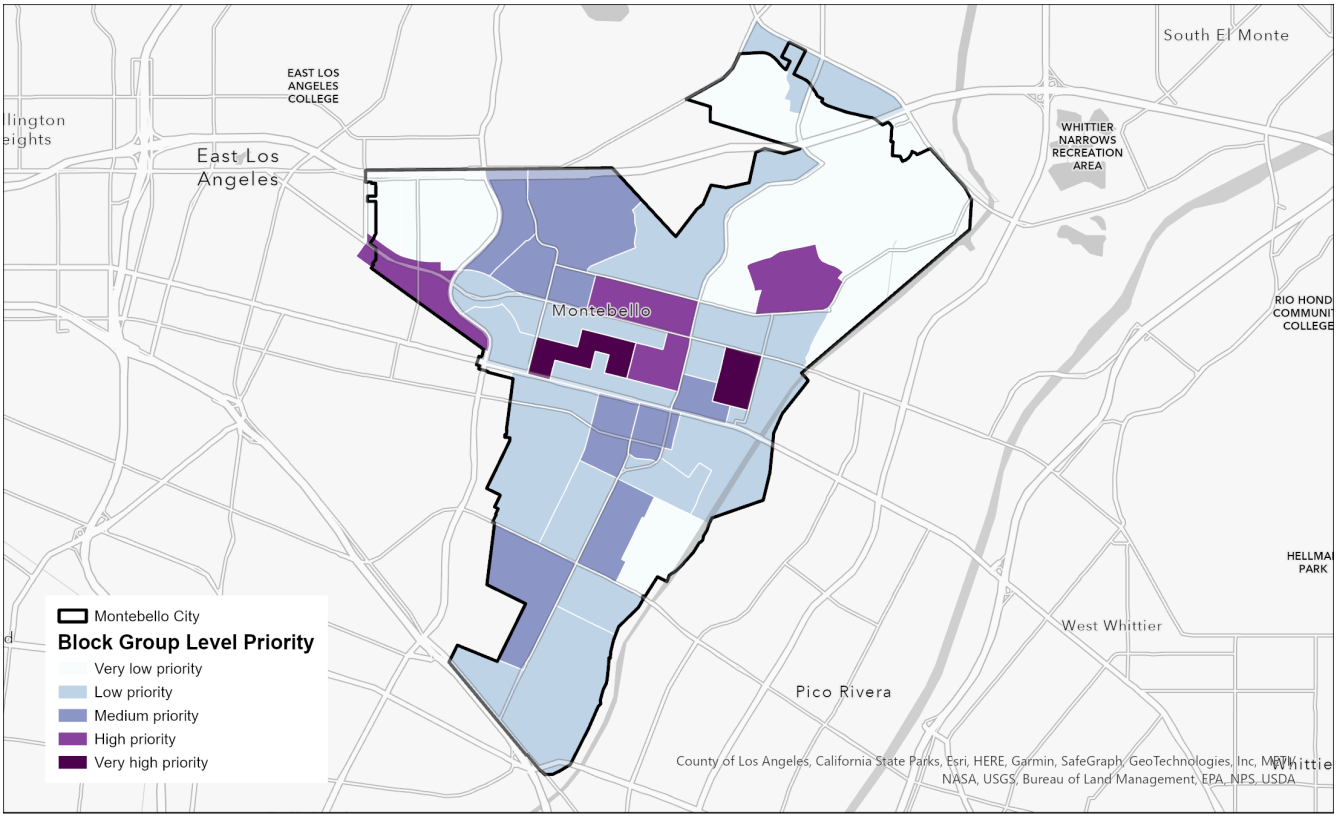
# Map of Priorities

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 earlier, 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 bus shelters, LA Metro maps were used.

Each variable was given a different weighting to account for the information gathered from the survey. Thus, Air Quality was weighted the highest, and Industrial Areas and Libraries were 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 planting trees. Figure 12 on the next page shows the overall priority map for increasing Montebello's tree canopy. As shown, all of the highest priority areas for planting trees are in the central area of the city. The lowest priority areas are found in the northeastern part of Montebello.

This priority map can be used alongside the Possible Tree Canopy maps (Figures 6 and 7) to determine best places for tree planting. In addition to the maps, a table was created to provide a comprehensive listing of the priority scores for planting locations for all 13,195 parcels in the City of Montebello. These are provided in an Excel file along with this report (see Appendix) and can help to guide future plantings by the City.

## STUDY FINDINGS




**Tree planting priority at block group level for City of Montebello**

Credits: University of Vermont Spatial Analysis Laboratory, SavATree Consulting Group, Los Angeles Regional Imagery Acquisition Consortium (LARIAC), Los Angeles County GIS Portal.

**Figure 12.**
Final prioritization map of the results from the Montebello Tree Canopy Survey. The collective responses from participants showed their highest priority areas for planting trees are in the central area of the city. The lowest priority areas are found in the northeastern and part of Montebello.

STUDY FINDINGS

# Perceptions of Urban Forestry in Montebello

In addition to identifying priorities, the survey asked about perceptions of tree planting and care in the City of Montebello. Respondents were given a set of statements regarding the importance of tree planting in Montebello, and barriers that are faced by urban forestry in the city.

Respondents ranked this series of statements on a scale from 1 to 5, where 1 was strongly agree and 5 was strongly disagree. As shown in Figure 13, nearly all (94%) of the participants chose Strongly or Somewhat Agree that the city should make Montebello greener by planting more trees. However, over half (61%) of respondents also Strongly or Somewhat agreed that there are barriers to planting trees in Montebello, and similar numbers (64%) agreed that there are barriers to taking care of trees in the city (Figure 13).

Those who agreed that there were barriers were asked to provide specific examples in a write-in response. About half of the respondents chose to list barriers, and these responses are summarized in Table 1. As shown, most barriers listed were able to be grouped in five main categories: 1) Community Knowledge & Responsibilities; 2) City Policies & Responsibilities; 3) Infrastructure/ Physical Environment; 4) Funding; and 5) Water.

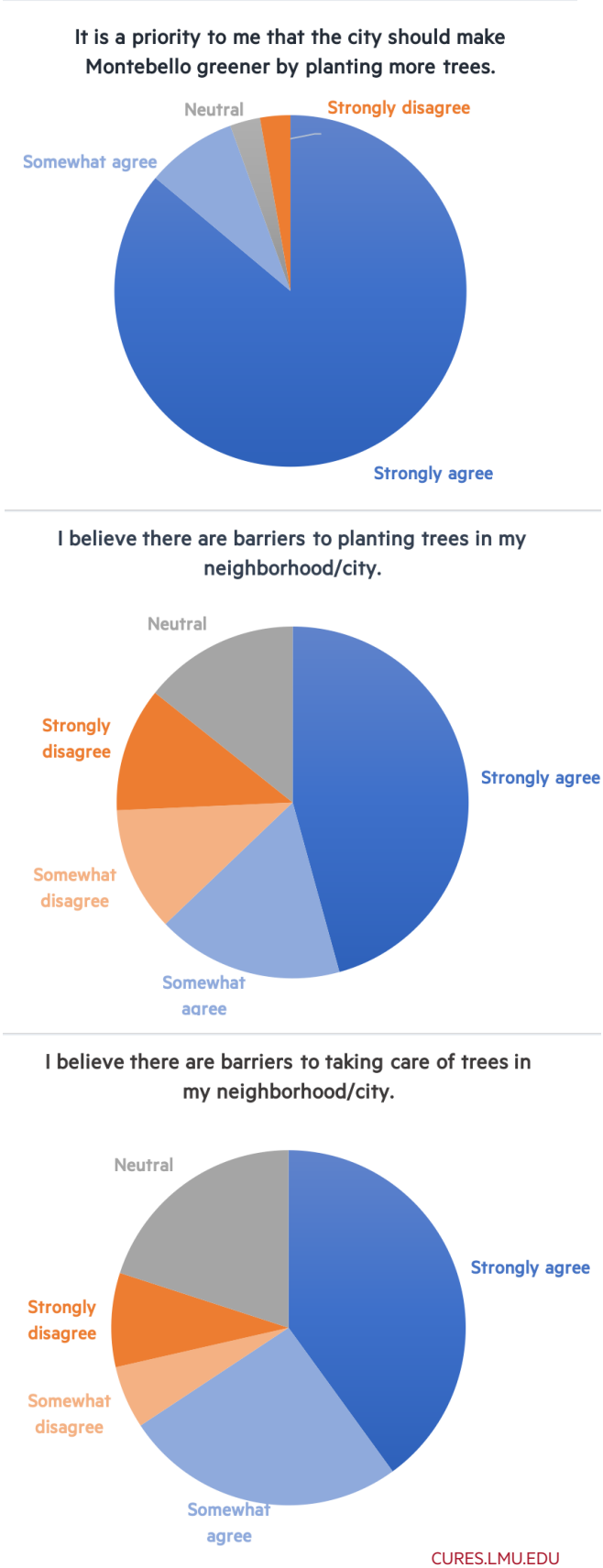



**Figure 13.**
Responses to the Montebello Tree Canopy Survey questions about perceptions of tree planting and care in the city.

## STUDY FINDINGS

**Table 1.**
Barriers to Tree Planting & Care Identified by Paramount Tree Canopy Survey respondents.

| Category | Example Barriers Listed |
|---|---|
| Community Knowledge & Responsibilities | Public support<br>Don't know how to care for tree<br>People have to made aware of how important trees are |
| City Policies & Responsibilities | City prohibits planting in the parkways<br>Lack of maintenance from the city<br>City needs to have rules for proper care of trees |
| Infrastructure/ Physical Environment | Limited resources to grow<br>Pollution<br>Space/Location |
| Funding | Budget<br>Money<br>Equipment |
| Water | Drought<br>Water conservation<br>Water usage |

Respondents were also asked about their personal connection, history, and concerns related to trees. There were 94% of respondents who agreed that "I feel a personal connection to trees," writing in reasons such as, "I go to trees for therapy and calm" and "trees are essential to our life."

The same number (94%) agreed that "Trees are important in my family and/or cultural history and traditions," with supporting statements including, "my family were immigrants from Mexico whose livelihoods depended on plants" and "was raised to respect all living things and care for them."

About 70% of respondents agreed that "I am concerned about more trees being planted in the city." Most of the write-in responses echoed the barriers listed in Table 1, though there were several who wrote in concerns about tree health and mortality, mentioning tree removal and harmful pruning practices.

There were 17 respondents who wrote in final remarks, which are listed in an Appendix.

SUMMARY & NEXT STEPS

# Next Steps

This report shows that the City of Montebello has great opportunity to increase its tree canopy, which at 13% is below the average for the Gateway Cities region and Los Angeles County as a whole. Analysis of the tree canopy data showed that 48% 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 central area of the city. This spatially represents the most chosen benefits of trees for survey participants, including Air Quality, Low Tree Canopy, Park Improvement, Reduced Heat, and Access to Green Space.

As it implements its Parks Master Plan, Montebello has the opportunity to increase tree canopy on public lands. This may be coupled with an outreach strategy to residents and commercial landowners to maximize tree canopy cover on private lands as well. In the near to medium term, the results can help the City of Montebello focus their planting efforts. By utilizing the data in this report, City leaders can pursue planting in high priority parcels that also score high on the Possible Tree Canopy map. This may involve reaching out to private property owners through educational campaigns and incentive programs. .

In the longer term, this report and the associated tools can aid in furthering urban forestry planning and initiatives in the city. It is notable that several respondents highlighted the need for urban forestry policies in their responses. Montebello may consider developing this type of policy. One possibility is to pursue state or other funding sources to develop an Urban Forestry Management Plan. Box 1 provides some resources for this effort.

**Box 1. 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

Montebello's prioritization is part of a regional effort by the project team to conduct prioritizations in the cities of Commerce, Lynwood, Paramount, and Vernon. The work in Montebello adds to this Gateway Cities initiative, providing the opportunity for collective impact.

The prioritization approach allowed for the use of a high resolution, high accuracy assessment of tree canopy in the City of Montebello as a foundation of a data-driven community engagement process. This helped to increase community awareness of the importance of urban trees; involve City staff, residents, and other stakeholders in decision-making regarding future tree planting; 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 Montebello 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

U.S. Census American Community Survey

# APPENDIX

Project Team List

Map 1: Existing & Possible Tree Canopy in Montebello

Map 2: Tree Canopy Priority Map for Montebello

Montebello Tree Canopy Survey (English version)

Additional Survey Comments

## DATA FILES

Excel: Table of Parcels with Tree Canopy Prioritization Score

KMZ: Montebello Parcel Level Tree Canopy Prioritization

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