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City of Commerce Tree Canopy Prioritization

Michele Romolini

Carlos Moran

Eric G. Strauss

Lisa Fimiani

Ada Li Sarain

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Final Report

Submitted by:

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Center for Urban Resilience

AUTHORS & ACKNOWLEDGEMENTS

Report Authors:

Michele Romolini, PhD
Managing Director
Loyola Marymount University Center for Urban Resilience (LMU CURes)
1 LMU Drive, MS 8510
Los Angeles, CA 90045

Carlos Moran, MSW, TreePeople

Eric Strauss, PhD, LMU CURes

Lisa Fimiani, LMU CURes

Ada Li Sarain, Independent Contractor

Acknowledgements:

EXECUTIVE SUMMARY

In 2019, the Loyola Marymount University Center for Urban Resilience (CURes) partnered with TreePeople to conduct a tree canopy prioritization in the City of Commerce. 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 the tree canopy data, acquired through a previous project between CURes and TreePeople, showed that the City of Commerce only has 5% tree canopy cover. This is in contrast to 25% cover in the City of Los Angeles, and 18% tree canopy cover found countywide. The analyses also found that Commerce has great opportunity to increase its tree canopy, with 51% of the land area of the city shown to be Possible Tree Canopy.

CURes and TreePeople held two planning meetings with the City of Commerce and conducted multiple forms of outreach to engage community participation in a "tree summit," which took place in November, 2019. Participants were introduced to the numerous ways that their city could benefit from increased tree canopy, engaged in a discussion 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, 33 surveys were collected, with the large majority (88%) of respondents indicating that they were residents of Commerce and a smaller number (42%) indicating that they worked in Commerce. Respondents had the opportunity to vote to prioritize 17 specific tree benefits across seven categories. Participants identified "Improve Air Quality and Reduce Noise" and "Beautify Neighborhoods" as their top priority categories for tree planting. Among the specific benefits, the highest priorities were Access to Parks, Air Quality, 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 Commerce that were already identified by the tree canopy assessment as Possible Tree Canopy.

The prioritization map revealed that highest priority areas of Commerce are in the northern and central parts of the City. 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 2,168 Residential Parcels, 909 Road Segments, and 4 Parks in the City of Commerce.

Together, the products of this tree canopy prioritization project can guide the City of Commerce in its urban forestry planning. In the near term, TreePeople will use these data to inform a planting of over 1,000 trees, most concentrated in parks, streets, and residential giveaways. In the longer term, the City can use these data to guide future tree planting strategies.

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1. INTRODUCTION

1.1. Background of Project

Residents of Los Angeles County suffer from public health issues that have been linked to environmental degradation, in particular, high rates of childhood obesity and asthma. Urban forestry is one strategy to increase cities' resilience to some of these concerns. Trees help reduce urban heat island effect, 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.

The Loyola Marymount University Center for Urban Resilience (CURes) collaborated with TreePeople, the Los Angeles Region Imagery Acquisition Consortium, the University of Vermont, and Savatree Consulting Group to produce a high resolution, high accuracy tree canopy assessment of Los Angeles County. With the generous support of Edison International, CURes was able to use this foundational dataset to inform a community-based, collaborative tree canopy prioritization process in the City of Commerce.

1.2. 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 Commerce, CA. This countywide assessment combined 2016 spatial imagery and LiDAR data to produce an 8-category land cover analysis (Figure 1) from which the tree canopy assessment could be derived.

Figure 1. 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)

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 2.
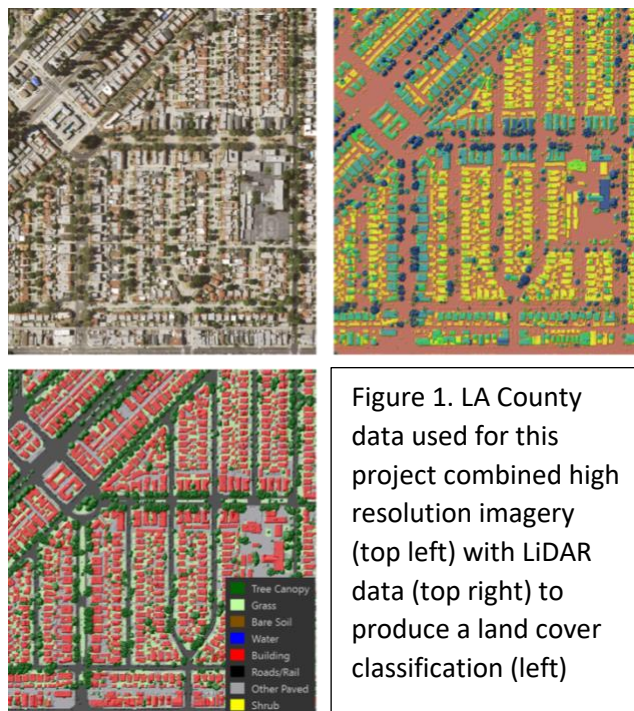
Figure 2. An example of tree canopy cover calculated at the property parcel level

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.

1.3. Tree Canopy and Environmental Justice in Commerce

For this project, tree canopy was calculated specifically for the 6.5 square mile land area of the City of Commerce. Commerce is located in southeast Los Angeles County, CA and has 12,808 residents, with 95.2% of residents identifying as Hispanic or Latino (U.S. Census Bureau 2019).

There are many potential environmental justice concerns for the residents of Commerce. As its name indicates, the city is known for industrial activities and has two major freeways—the I-5 and the I-710— and a railroad running directly through the city. The recently closed Exide Technologies battery plant in neighboring Vernon contributed to decades of air pollution and left behind a legacy of contaminated soil across the area. Information from the California Communities Environmental Health Screening Tool (CalEnviroScreen) shows that most areas of Commerce are classified as "High Pollution, Low Population." The remaining areas and bordering regions are all classified in the highest category, 91%- 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 Commerce's tree canopy is one way to help mitigate some of the impacts of these environmental burdens.

As shown in Figure 3, Commerce was found to have immense potential for increasing its tree canopy. The City only had 5% of its land area covered by Existing Tree Canopy, but over half of Commerce's land area was found to be Possible Tree Canopy (Figure 4). The remaining 44% 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.
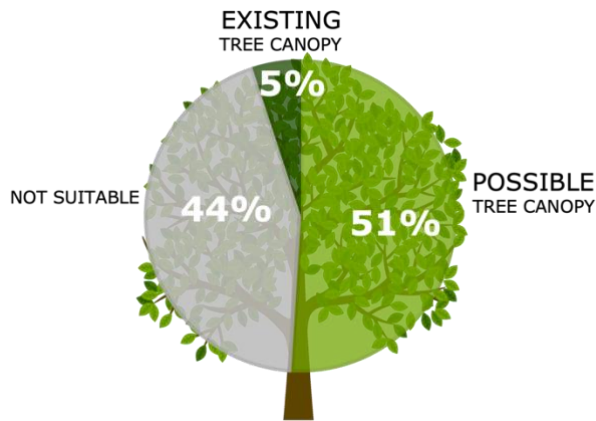
Figure 3. Tree canopy metrics for Commerce, CA

Notably, while not candidates for this report, it was discussed in planning meetings with the City that future tree planting plans may consider incorporating green roofs for buildings, as large industrial buildings comprise a sizeable portion of this Not Suitable land.

For comparison, at 5% Existing Tree Canopy the City of Commerce has relatively low canopy cover. Using the same data, the City of Los Angeles was found to have 25% Existing Tree Canopy and Los Angeles County was found to have 18%.
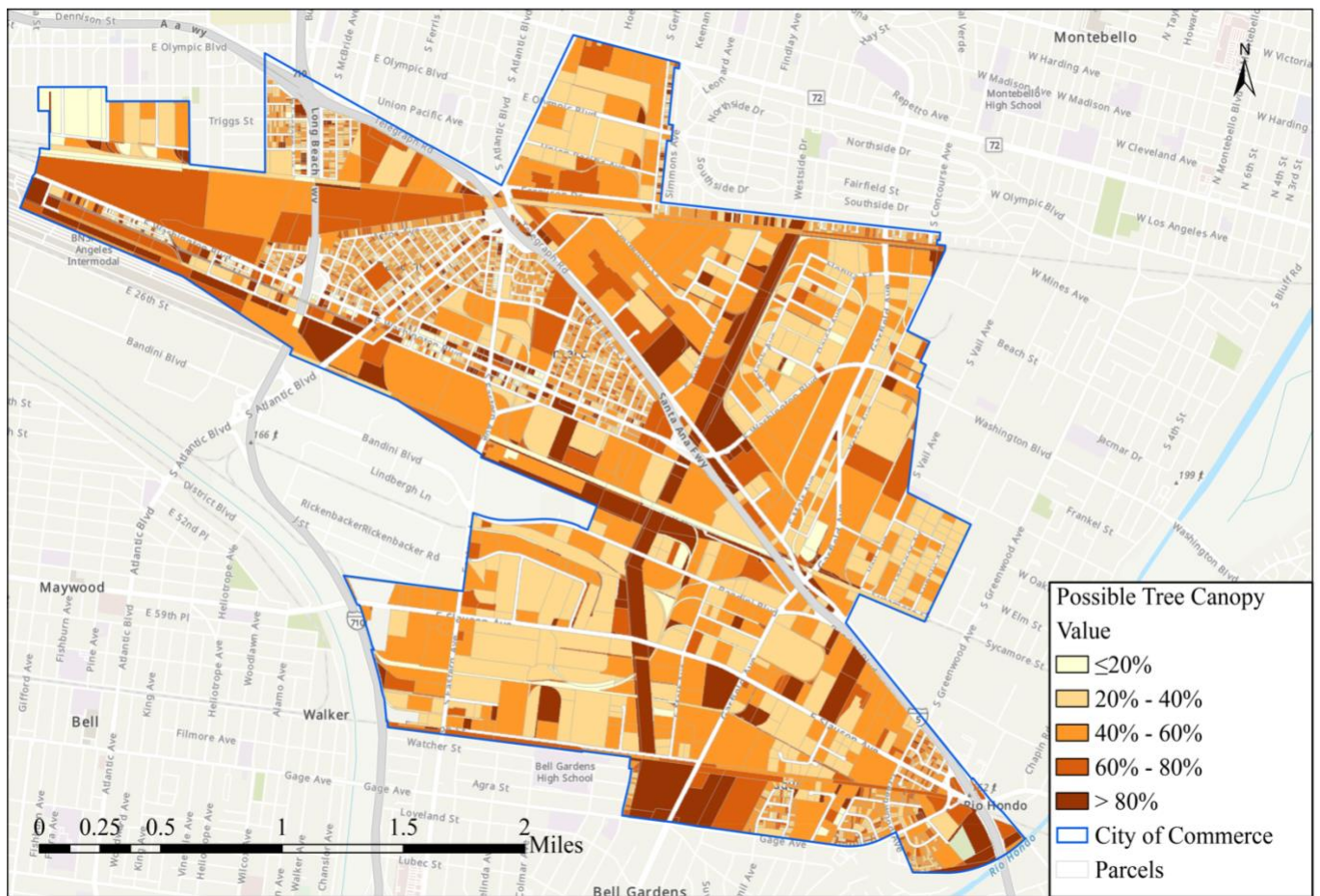

Figure 4. Map of Possible Tree Canopy for Commerce. Higher percentages indicate greater land area available for planting trees.

Digital maps of Existing and Possible Tree Canopy can be found in the Attachments of this report.

1.4. Prioritization Process

The data on Commerce'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. To help meet this objective, the LMU Center for Urban Resilience partnered with TreePeople and the City of Commerce 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 Commerce 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.

CURes worked closely with TreePeople and the City of Commerce to conduct this process. Staff from CURes and TreePeople held two planning meetings in mid-2019 at City Hall in Commerce, with the City Manager, Director of Public Works, and other city representatives. The public tree summit was held on the evening of November 14, 2019 at the Commerce Senior Citizens Center, led by TreePeople and CURes. Goals of the event were to introduce the project to the public, share information about the value and benefits of tree canopy, and to survey participants on their priorities for increasing tree canopy in Commerce. Participants were provided with surveys in both English and Spanish, and once they completed the survey, they were encouraged to indicate their priorities on a series of large posters set up throughout the room (Figure 5). In addition, surveys were distributed at a meeting of the East Yards Communities for Environmental Justice, which was taking place at the same time at the tree summit. The full survey can be found in the Attachments.
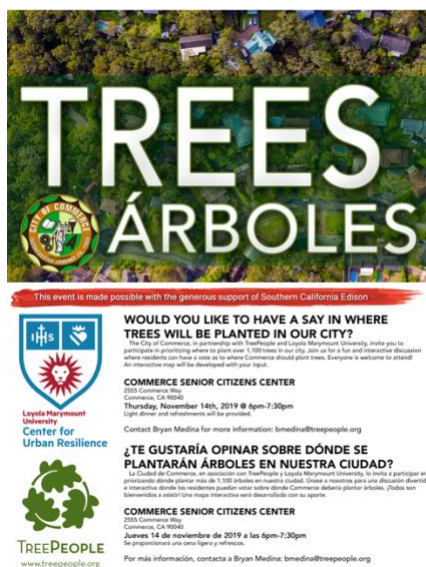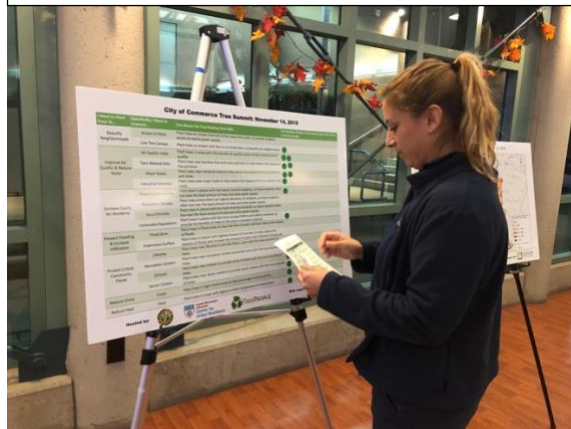

Figure 5. Informational flyer for the tree summit (left), where participants indicated their priorities for planting trees (right)

2. STUDY RESULTS

A total of 33 participants completed surveys. Their responses are summarized in the following sections.

2.1. Participant Characteristics

In addition to the section on choosing tree canopy priorities, the survey asked participants to indicate whether they live and/or work in Commerce, to list their zip code and/or name of their employer, and to provide an email address if they wanted to receive a personalized map of their chosen priorities.

The results showed that most of the survey respondents were residents of Commerce: 29 of 33 (88%) indicated living in the City. Of those, 28 lived in zip code 90040, which covers most of Commerce. The other resident lived in 90022.

The results showed that 14 of the 33 participants (42%) worked in Commerce. Organizations represented included the City of Commerce (5 responses), Health Net (2 responses), Bandalini Elementary (1 response), East Yard Communities for Environmental Justice (1 response), the Library (1 response), the Navy (1 response), and St. Marcellinus (1 response). Two participants indicated working in the City but did not list an organization.

2.2. Tree Planting Priorities - Survey

Participants were given a list of 17 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 Commerce. 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 17 benefits were grouped into 7 categories: Beautify Neighborhoods, Increase Equity for Residents, Improve Air Quality and Reduce Noise, Prevent Flooding and Increase Infiltration, Protect Critical Community Places, Reduce Crime, and Reduce Heat (see Figure 6 and Attachments).

I Want to Plant Trees To...	Specifically, I Want to Improve...	This Means the Tree Planting Team Will...	The Number of X's in This Column Show That This is a Priority for Me
Beautify Neighborhoods	Access to Parks	Plant trees on streets that are further away from parks, to provide residents access to nearby green spaces.	
	Low Tree Canopy	Plant trees on streets with few or no street trees, to beautify the neighborhood.	X
Improve Air Quality & Reduce Noise	Air Quality Index	Plant trees in areas with the poorest air quality scores to help improve the air quality.	X
	Toxic Release Sites	Plant trees near facilities that emit toxic pollution to help reduce the impacts of the pollution.	
	Major Roads	Plant trees near industrial zones to help reduce the impacts of the air pollution and noise.	X
	Industrial Activities	Plant trees near major roads to help reduce the impacts of the air pollution and noise.	X
Increase Equity for Residents	Poverty/Low Income	Plant trees in places with the lowest-income residents, as those residents often live near the least amount of trees and other green spaces.	X
	Population Density	Plant trees where there are highest densities of residents, as those residents often live near the least amount of trees and other green spaces.	
	Race/Ethnicity	Plant trees in places with the most minority residents, as those residents often live near the least amount of trees and other green spaces.	
	Vulnerable Populations	Plant trees in places with the most young children and elderly residents, to provide the benefits of trees to the most vulnerable residents.	
Prevent Flooding & Increase Infiltration	Flood Zone	Plant trees in flood zones to slow the flow of water and help reduce the impacts of floods.	X
	Impervious Surface	Plant trees in places with highest amount of concrete, to help reduce the impacts of floods and increase the amount of water that infiltrates the ground.	
Protect Critical Community Places	Libraries	Plant trees near libraries to provide library users with the many benefits of trees.	
	Recreation Centers	Plant trees near rec centers to provide users with the many benefits of trees.	
	Schools	Plant trees near schools to provide school children with the many benefits of trees.	X X
	Senior Centers	Plant trees near senior centers to provide senior citizens with the many benefits of trees.	
Reduce Crime	Crime	Plant trees in high crimes areas to help discourage criminal activity.	X
Reduce Heat	Heat	Plant trees in areas with highest surface temperature to reduce heat.	X

Figure 6. An example of the survey choices from a participant in the Commerce Tree Summit. The survey taker prioritized Schools by placing two votes in that row, and distributed the remaining 8 votes evenly across other rows

As exemplified in Figure 6, 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, as above, 2 votes for Schools, and 1 vote each for Low Tree Canopy, Air Quality, Majors Roads, Industrial Activities, Poverty/Low Income, Flood Zone, Crime, and Heat).

When the survey results were analyzed by *specific benefit*, results from the 33 surveys showed that participants most frequently identified Access to Parks as the highest priority. This is followed by Air Quality, Heat, Low Tree Canopy, and Schools. Figure 7 shows how the specific benefits were prioritized.
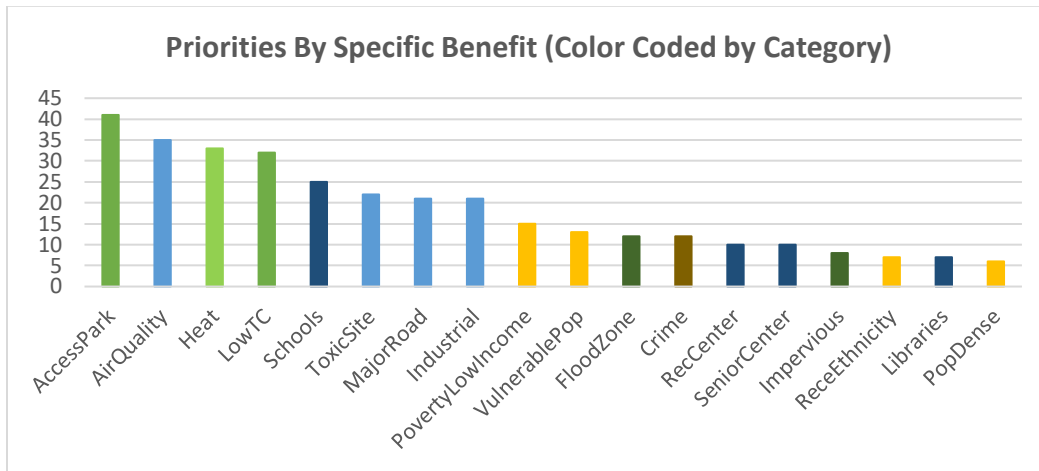

Figure 7. Tree planting priorities by specific benefit indicated by participants in the Commerce survey

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 8). This was followed by Beautify Neighborhoods with 22% of the votes, Protect Critical Community Places (16%), Increase Equity for Residents (12%), Reduce Heat (10%), Prevent Flooding and Increase Infiltration (6%), and Reduce Crime (4%).
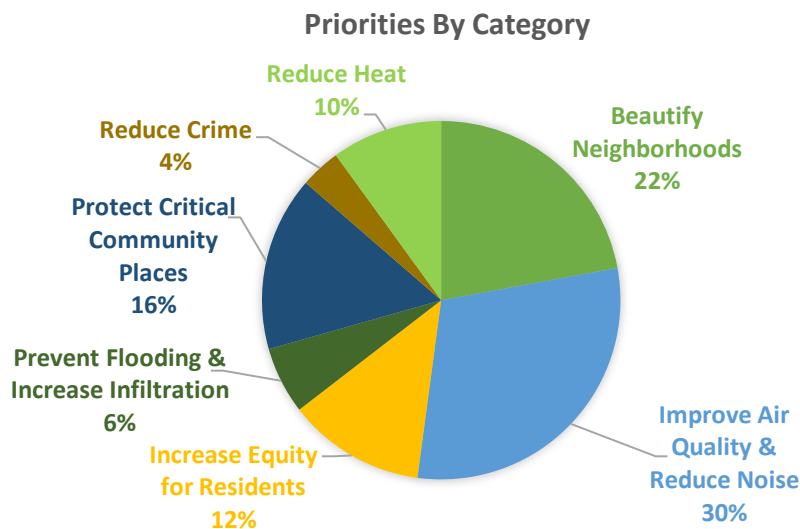

Figure 8. Tree planting priorities by category indicated by participants in the Commerce survey

2.3. 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 Flood Zone, spatial data from the Federal Emergency Management Agency (FEMA) were used; for Heat, surface temperature data was acquired from NASA's ECOSTRESS program.

Each variable was given a different weighting to account for the information gathered from the survey. Access to Parks was weighted the highest and Population Density was weighted the lowest. The combined weighted analysis of all priority variables was then overlaid on the Possible Tree Canopy (see Figure 4) to produce a map of priority areas where it is feasible to plant trees. Figure 9 shows the overall priority map for increasing Commerce's tree canopy.
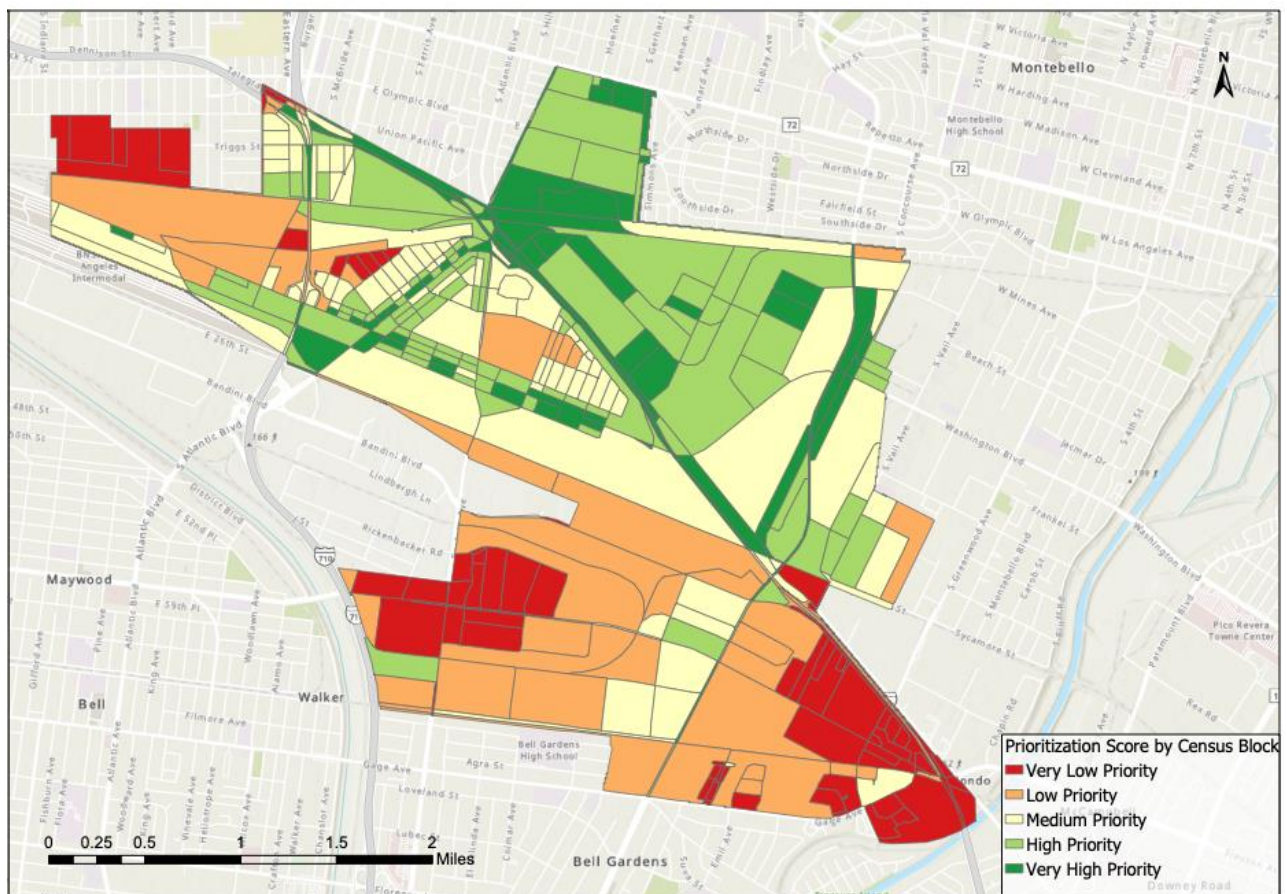

Figure 9. Overall priority map for tree planting in the City of Commerce, organized by Census Block. Northern and central areas of the city are highest priority for planting.

A second map was produced to show only the priority areas that are in parks, the public right of way (e.g. street trees), or residential locations (Figure 10). This map was developed to inform the upcoming

planting of over 1,000 trees that will be led by TreePeople and is limited to parks, streets, and giveaways to residents.
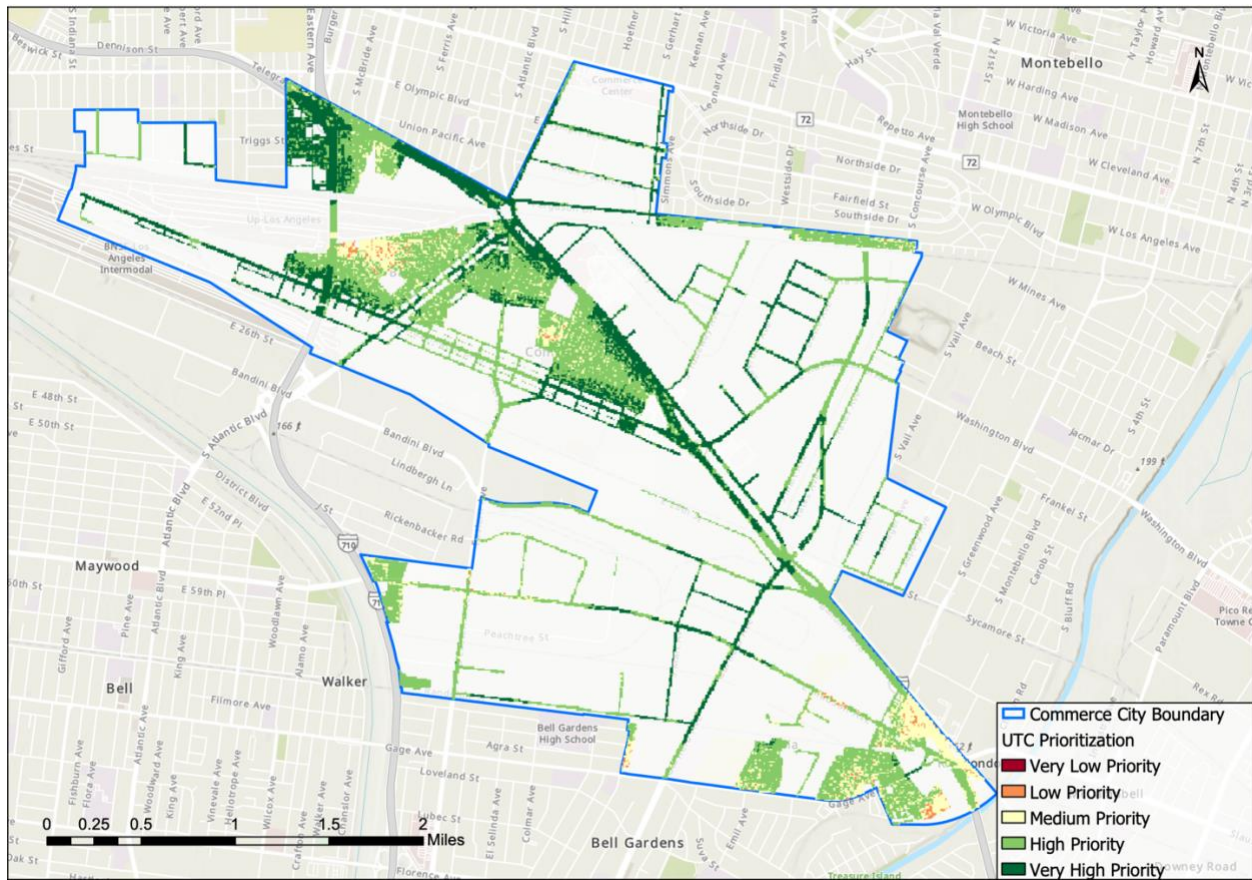

Figure 10. Priority map for tree planting in the right of way, parks, and residential areas of the City of Commerce, organized by parcel. The I-5 and 710 freeways along with major thoroughfares of the city are highest priority for planting.

All maps developed for this project are also provided as large format files along with the report. In addition to the maps, three separate tables were created to provide a comprehensive listing of the priority planting locations for 2,168 Residential Parcels, 909 Road Segments, and 4 Parks in the City of Commerce. These are provided as Excel files along with this report and can guide both the upcoming TreePeople planting as well as future plantings by the City (see Attachments).

3. DISCUSSION

This report shows that there is great opportunity for the City of Commerce to increase its urban forest. Analysis of the tree canopy data showed that 51% 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 northern and central areas of Commerce, and tend to be focused on the I-710 and I-5 freeways along with other major thoroughfares of the city. This reflects the

category of greatest priority identified by participants in the Tree Summit, which was Improve Air Quality and Reduce Noise.

In meetings with officials from the City of Commerce, air quality improvement was identified as a priority of their policy and planning efforts. The city has worked to identify "Green Zones" and is developing an action plan for these zones. The results from this prioritization process may help inform tree canopy and tree planting goals for these green zones. Commerce is also in the midst of creating maps and plans for pedestrian and bicycle routes in the city. Increasing tree canopy along these routes can provide shade, air quality, and aesthetic benefits and may further encourage their use. The priority locations identified in this report offer a road map for these efforts.

In the immediate term, these data can help inform the planting of over 1,000 trees planned by TreePeople in early 2020. According to a recent tree inventory, the City of Commerce has approximately 3,000 trees, so this planting will increase the urban forest by over 30%. The Tree Summit, along with other community engagement efforts led by TreePeople, provide the opportunity for public participation in the process. Involving residents and other stakeholders in the decision-making and actual planting of trees in the city will help to increase the success of Commerce's urban forestry efforts and the resilience of its communities.

In the longer term, there are several ways that Commerce may consider moving forward with their tree canopy efforts. As more data become available, such as the pedestrian and bicycle routes, the city can use those maps to help focus their geographic priorities for tree planting. As another example, acquisition of contaminated soils data could be an important input when considering where to plant fruit trees. The City may also consider utilizing the results of this report as a foundation to conduct a more formalized Urban Forest Management Plan. Annual grants are available at the state level through the CAL FIRE Urban and Community Forestry Program (CAL FIRE 2020).

As described here, the City of Commerce has both high need and high opportunity for increasing its urban forest. The information gathered and reported on here can help support those efforts.

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ATTACHMENTS

Commerce Tree Canopy Prioritization Survey (English & Spanish)

Map 1: Existing Tree Canopy in Commerce

Map 2: Possible Tree Canopy in Commerce

Map 3: Overall Tree Canopy Priority Map for Commerce

Map 4: Park, Public Right of Way, and Residential Priority Map for Commerce

Tables of Priority Parcels for Tree Canopy in Commerce