we all need PARKS
for healthy, thriving and engaged LA communities

TECHNICAL APPENDIX

- GLOSSARY AND DATA SOURCES
- MAPPING AND ANALYSIS PROCESSES
- COST ESTIMATE ASSUMPTIONS

GLOSSARY & SOURCES

The **Glossary** provides data sources as well as an explanation of terms, maps, and statistics throughout the toolkit.

Not all datasets used for this analysis are complete or uniform across the entire County. Violent crime occurrence locations are limited to communities whose law enforcement agency provides their data to the public in a geospatial form. For other areas the best readily available data source is referenced. For these areas, crime data is summarized as either the census tract or block group level. Heath data is limited by the sample size and validity of the source data. Due to the small sample size of some of the data layers holes exist throughout the county, so the data does not cover every Study Area in its entirety.

Accessible Park Acres: This map shows the quantity of park acres available to residents of the Study Area. Accessible park acres are calculated by assigning a park service area to each park, based on the acres of the park and using the County's service area standards as a guide for parks under 10 acres. The park service areas used were as follows: 3 acre or smaller park: ¼ mile service area; 3-10 acre park: ½ mile service area; more than 10 acre or Special Use Facilities: 2 mile service area. Service area distances are determined using the walkable road/pedestrian network to more accurately represent distance (see Distance to Park for in-depth explanation). Populations located within the service area of a park are considered to have all those park acres available to them. Populated areas two or more miles from a park are represented as having 0 park acres available to them. Populations within 2 miles of a park are given the total number of acres they have access to. For example, if a household is within a quarter mile of Park A (5 acres) and a half-mile of Park B (2.4 acres) it will be represented as having access to 7.4 acres of parkland. This analysis is not confined to Study Area boundaries, so park acreage in adjacent Study Areas can be considered accessible to any population within the park's service area.Data was classified into 10 categories based on quantiles. The higher the available park acres the lower the need.

> *Data Sources: GreenInfo Network – California Protected Areas Database, 2015 http://www.greeninfo.org/work/project/cpad-the-california-protected-areas-database; Los Angeles County – Street & Address File, http://egis3.lacounty.gov/dataportal/2014/06/16/2011-la-county-street-centerline-street-address-file/*

Amenities per 100,000 people: Amenity data presented for each Study Areas was captured during the Inventory Web Portal phase of this Needs Assessment. Each of the participating cities, the County of Los Angeles, and other State, regional, and local agencies reviewed their parks and reported their amenity information. For each Study Area, the number of each amenity available per 100,000 people was calculated for comparison with County-wide, State Top Cities Average, and National Top Cities Average numbers.

Amenity data used for the County-wide average was reported during the Inventory Web Portal Phase of this Needs Assessment.

Amenity data used for the State and National Top Cities averages is from the Trust for Public Land Center for City Park Excellence 2015 City Park Facts report. The data in this report comes from surveys completed by the park department in the nation's 100 most populous cities.

The data reported in the State Top Cities Average category is from all California cities included in the 2015 City Facts report. The 16 cities included in this average are Anaheim, Bakersfield, Chula Vista, Fremont, Fresno, Irvine, Long Beach, Los Angeles, Oakland, Riverside, Sacramento, San Diego, San Francisco, San Jose, Santa Ana and Stockton.

The National Top Cities reports the average of the 10 cities with the greatest quantity per 100,000 people of the given amenity. Thus, the cities included in the National Top Cities average vary by amenity type.

> *Data Source: City Park Facts 2015: The Center for City Park Excellence, The Trust for Public Land. (http://www.tpl.org/sites/default/files/files_upload/2015-City-Park-Facts-Report.pdf)*

Amenity Condition was reported by each park's lead agency during the Inventory Web Portal phase of this Needs Assessment. Each of the participating cities, the County of Los Angeles, and other State, regional, and local agencies reviewed their parks and reported the condition of the amenities in each park.

In general, amenities in "Good" condition are fully functional and do not need repairs. They may have minor cosmetic defects, but they encourage area residents to use the park. Amenities in "Fair" condition are functional but need minor or moderate repairs, and may have time periods where they are unusable. Despite minor repairs needed, fair facilities remain important amenities for the neighborhood. Amenities in "Poor" condition are largely or completely unusable and require major repairs to be functional. For in-depth descriptions of "Good," "Fair," and "Poor" conditions of each amenity type, please refer to the "Park Amenity Condition Visual Manual and Operational Definitions" booklet (included within digital version of toolkit).

Avaliable Vacant Land: The parcels highlighted on this map may have potential to become a park in the future, as determined through a review process with the lead agency of each Study Area. Base Opportunity Sites data was provided by the County Assessor. Parcels with a vacant use code were sorted into five designations: vacant county owned, vacant city owned, vacant other publicly owned, vacant privately owned, vacant utility owned. Each lead agency was given the opportunity to review the vacant parcels within their Study Area and determine if any of the identified parcels could potentially become parks in the future.

Data Source: Los Angeles County Office of the Assessor - Assessor Parcels, 2015

Bike/Pedestrian Collisions: This map shows all collisions between automobiles and bikes and all collisions between automobiles and pedestrians. The data used for the map was collected between 2003 and 2012. The size of the circle on the map indicates the number of collisions occurring in and around a given location. Point data is clustered to consolidate accidents occurring within 500 feet of one another. This clustering technique simplifies analysis of the data – larger circles indicate more collisions, smaller circles indicate fewer. The data used in this map is from the Transportation Injury Mapping System (TIMS). This system was established by researchers at the Safe Transportation Research and Education Center (SafeTREC) at the University of California, Berkeley to provide data and mapping analysis tools and information for traffic safety related research, policy and planning.

Data Source: Transportation Injury Mapping System, SWITRS Collision Raw Data 2003-2012, http://tims.berkeley.edu/page.php?page=switrs_resources#download, accessed June 5, 2015.

Census Undercount: The U.S Census Bureau found that the 2010 Census had a net overcount of 0.01 percent, meaning that 36,000 people were over counted. As with previous year censuses, the coverage of the population was different across demographic characteristics. The 2010 Census undercounted 2.1 percent of the black population, and 1.5 percent of the Hispanic population. In 2010, there was not a statistically significant undercount for Asian or Native Hawaiian or Other Pacific Islander population.

Data Source: United States Census, Newsroom Archive https://www.census.gov/newsroom/releases/archives/2010_census/cb12-95.html

Countywide Air Quality and Health Data: Data on these maps are classified into five categories: very low, low, moderate, high, and very high, based on quantiles. With quantiles, the range of possible values is divided into unequal-sized intervals so that the number of values is the same in each class. Because intervals are wider at the extremes, this option is good at highlighting changes in the middle values of the distribution.

Countywide Air Quality and Health Data – Diesel Particulate Matter Concentration: This map shows the concentration of diesel particulate matter across the county. Diesel Particulate Matter (PM) consists of particles emitted from diesel engines found in cars, trucks, buses, trains and heavy duty equipment. Diesel PM contains carcinogens and ultrafine particles that may contribute more to adverse health effects than larger particles. Adverse

health effects from diesel PM include eye, throat, and nose irritation, cardiovascular and pulmonary disease, and lung cancer. Children and those with existing respiratory disease are especially susceptible to the harmful effects of diesel PM.

Data Source: California Office of Environmental Health Hazard Assessment, CalEnviroScreen 2.0 2013, http://oehha.ca.gov/ej/ces2.html

Countywide Air Quality and Health Data – Ozone Concentration: This map shows the concentration of ozone across the county. Ozone is an extremely reactive form of oxygen which provides protection from the sun's ultraviolet rays when it occurs in the upper atmosphere. When ozone is present at ground level, however, it is the primary component of smog. Ground level ozone can cause lung irritation, lung inflammation, lung disease, and can worsen existing chronic health conditions. High levels of ozone are also associated with increased rates of asthma-related hospitalization for children, higher mortality rates, and increased cardiovascular and respiratory emergency room visits.

Data Source: California Office of Environmental Health Hazard Assessment, CalEnviroScreen 2.0 2013, http://oehha.ca.gov/ej/ces2.html

Countywide Air Quality and Health Data – PM 2.5 Concentration: This map shows the concentration of PM 2.5 across the county. Particulate matter 2.5 micrometers or less in diameter is generally a complex mixture of solid and liquid particles including organic chemicals, dust, allergens, and metals. Also known as fine particle pollution, PM 2.5 enters the lungs and causes adverse health effects in respiratory and cardiovascular systems. PM 2.5 has been associated with adverse effects on lung development in children, increased hospital admissions for respiratory and cardiovascular diseases, increased mortality, low birth weight and premature birth.

Data Source: California Office of Environmental Health Hazard Assessment, CalEnviroScreen 2.0 2013, http://oehha.ca.gov/ej/ces2.html

Diabetes Death Rate: The diabetes death rate is the percent of death certificates listing diabetes as the underlying cause of death.

Data Source: Glossary: United States Census Bureau, https://www.census.gov/glossary/#term_Linguisticisolation, accessed September 15th, 2015.

Distance to Park: This map shows areas within various distances of a given park. Distances were calculated along the walkable road/pedestrian network rather than "as the crow flies." Measuring distance along routes that a pedestrian could travel gives a more accurate representation of the distance to a park. Since pedestrians cannot safely or legally walk on highways, they have been removed from the analysis, indicating a barrier that affects distance to a park. Data was classified into 6 categories based on the following distance thresholds: ¼ mile, ½ mile, 1 mile, 1 ½ miles, 2 miles, and more than 2 miles. The farther the distance from parks, the higher the need.

Data Sources: GreenInfo Network – California Protected Areas Database, 2015 http://www.greeninfo.org/work/project/cpad-the-california-protected-areas-database; *Los Angeles County – Street & Address File, http://egis3.lacounty.gov/dataportal/2014/06/16/2011-la-county-street-centerline-street-address-file/*

General Park Infrastructure Condition was reported by each park's lead agency during the Inventory Web Portal phase of this Needs Assessment. Each of the participating cities, the County of Los Angeles, and other state, regional, and local agencies reviewed their parks and reported the condition of each park's general infrastructure.

General park infrastructure includes walkways, parking lots, park furniture, drainage and irrigation, lighting systems and vegetation. General park infrastructure in "Good" condition is fully functional and does not need repairs. General park infrastructure in "Fair" condition is functional but needs minor or moderate repairs. General park infrastructure in "Poor" condition is largely or completely unusable and requires major repairs to be functional. For in-depth

descriptions of "Good," "Fair," and "Poor" conditions of general park infrastructure, please refer to the "Park Amenity Condition Visual Manual and Operational Definitions" booklet.

Income Below 200% Poverty Level: The Needs Assessment uses 200% of the Federal Poverty Level to assess poverty levels in each Study Area. In 2014 (the year the data was collected), the 200% Federal Poverty Level for a family of four was $48,500. In California, income at or below the 200% Federal Poverty Level is required for eligibility for CalFresh (California Food Assistance Program).

Data Sources: Los Angeles County - Poverty Estimates, 2013; Federal Poverty Guidelines, Families USA, http://familiesusa.org/product/federal-poverty-guidelines#2014, accessed September 15th, 2015

Initial Potential Park Projects: The initial potential park projects provided within the toolkit were developed using the methodology described in the "Initial Potential Projects" section of the toolkit. Please refer to that section for additional information on the methodology.

All potential park projects must meet the following criteria:

1. Be site specific, with the following exception:
    a. Repair/improvements/additions of general park infrastructure elements such as signage, park furniture, irrigation, security lighting and restrooms at multiple sites can be considered one project.
2. A project must fall into one of the following three categories:
    a. Repair Existing Amenities
        i. A project of this type can only address one amenity category per project. For example, each of these would be considered a single project:
            1. Repair 5 basketball courts at Park X
            2. Repair pool at Park X
            3. Repair turf, goalposts, and lights at 3 soccer fields at Park X
        ii. General Park Infrastructure is a single amenity category and includes landscaping, drainage, irrigation, parking lots, park furniture, walkways, security lighting and restrooms. All general infrastructure repairs needed in a given park should be considered as one project. Each of these would be considered a single project:
            1. Resurface parking lot, repair broken irrigation system, replace broken lighting at Park X
            2. Fix drainage issues, replace broken drinking fountains, fix buckled walkways, re-stripe parking lot at Park Y
        iii. Repair of a single category of general infrastructure at multiple sites should be considered one project. Each of these would be considered a single project:
            1. Repair restrooms at all parks in Study Area
            2. Repair security lighting at all parks in Study Area
            3. Repair irrigation systems at all parks in Study Area
    b. Add or Replace Amenities at an Existing park
        i. A project of this type can only address one amenity category per project. For example, each of these would be considered a single project:
            1. Replace 3 soccer fields at Park X with artificial turf and add lights
            2. Add 2 basketball courts to Park X
            3. Expand splashpad at Park X

ii. General Park Infrastructure is a single amenity category and includes landscaping, drainage, irrigation, parking lots, park furniture, walkways, general lighting (not athletic field lighting). Sample projects:

1. Add smart irrigation controller, expand parking lot, and add 10 picnic tables at Park X
2. Plant 7 trees, add 2 drinking fountains, upgrade to drip irrigation throughout park

iii. Adding or replacing a single category of general infrastructure at multiple sites should be considered one project. Each of these would be considered a single project:

1. Add restrooms at all parks in Study Area
2. Replace irrigation controllers at all parks in Study Area
3. Replace all park furniture at all parks in Study Area

c. Building a New Park or Specialty Facility

i. A new park will be considered to include land acquisition, general park infrastructure and two types of amenities

1. A new park will count as 3 projects on the final list
2. If additional amenity types are desired in the new park, each should be considered a separate project

ii. Specialty facilities include arboretums, gardens, aquatic centers, equestrian facilities, golf courses, and amphitheaters that will serve a need beyond the Study Area. Specialty facility projects will include land acquisition, general park infrastructure and the specialty facility itself

1. A specialty facility will count as 3 projects on the final list

Key Community Characteristics: Asthma E.R. Visits: This map shows the number of emergency room visits for asthma treatment. The data are classified into five categories: very low, low, moderate, high, and very high using a quantile-based approach (that is, the number of data points are divided into five equal-sized groups).

Data Source: California Office of Environmental Health Hazard Assessment, CalEnviroScreen 2.0 2013, http://oehha.ca.gov/ej/ces2.html

Key Community Characteristics: No Vehicle Access: This map shows the percent of households without access to a vehicle. The data are classified into five categories: very low, low, moderate, high, and very high using a quantile-based approach (that is, the number of data points are divided into five equal-sized groups).

Data Source: U.S EPA, Smart Location Database 2014, http://www2.epa.gov/smart-growth/smart-location-mapping

Key Community Characteristics: Obesity: This map shows the percent of obese 5th graders. In areas with only one school, the data may not accurately reflect childhood obesity rates for the entire area. In areas without any schools, no obesity data is included. The data are classified into five categories: very low, low, moderate, high, and very high using a quantile-based approach (that is, the number of data points are divided into five equal-sized groups).

Data Source: Los Angeles County Department of Public Health, 2015

Key Community Characteristics: Population Density: This map shows population density (number of people per acre). Population density is measured using a 1-acre grid system approach. The County was divided into 1-acre cells and the population density of each cell was calculated. In areas without population, the population density map appears gray, indicating that the population density in that location is zero, or nearly zero people per acre. These areas are generally commercial areas and industrial areas without residential land use. The data was classified using a quantile-based approach (that is, the number of data points are divided into five equal-sized groups). Higher population density contributes to higher park need.

Data Source: Los Angeles County - Age/Race/Gender Population Estimates, 2014

Key Community Characteristics: Poverty: This map shows the percent of households at or below the 200% Federal Poverty Level. The data are classified into five categories: very low, low, moderate, high, and very high using a quantile-based approach (that is, the number of data points are divided into five equal-sized groups).

Data Source: Los Angeles County - Poverty Estimates, 2013

Key Community Characteristics: Map of Combined Community Characteristics: This map shows the result of overlaying the previous five maps (poverty, population density, no vehicle access, obesity and asthma E.R. visits). The data are classified into five categories: very low, low, moderate, high, and very high using a quantile-based approach (that is, the number of data points are divided into five equal-sized groups).

Areas shown in the "Very Low" category generally have low rates of poverty, low population density, low rates of no vehicle access, low rates of obesity, and low numbers of asthma E. R. visits. Conversely, areas in the "Very High" category generally have high rates of poverty, high population density, high rates of no vehicle access, high rates of obesity, and high numbers of asthma E.R. visits.

Data Source: LA county, and GreenInfo Network

Linguistically Isolated Population is a population in which all members that are 14 years or older speak a non-English language and also speak English less than "very well." The percent reported in this report is the total percent of the population in the Study Area that is linguistically isolated. In addition, the language spoken by the greatest percent of the linguistically isolated population is noted.

Data Source: U.S. Census Bureau, American Community Survey, 5 Year Estimates, 2013, http://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml

No Vehicle Access: Any household that reports no automobiles, vans, or trucks kept at home for use by members of the household is categorized as having no vehicle access.

Data Source: U.S EPA, Smart Location Database 2014, http://www2.epa.gov/smart-growth/smart-location-mapping

Park Accessibility is evaluated by looking at each household's distance from a park (refer to "Distance to Park" in this Glossary for additional information). The Trust for Public Land's Center for City Park Excellence identified a ½ mile (approximately 10 minute) walk to a park as the distance that most pedestrians are willing to walk to reach a park. This distance has been widely adopted as a standard for providing nearby access to parks and open space. Of the 100 largest cities in the United States that have explicit park distance goals, over 60 percent use ½ mile.

Data Sources: Harnik, Peter and Abby Martin. Close to Home: A Half-Mile or Less. The Center for City Park Excellence, The Trust for Public Land. Accessed on October 15, 2015 at http://parkscore.tpl.org/Methodology/TPL_10MinWalk.pdf; GreenInfo Network – California Protected Areas Database, 2015 http://www.greeninfo.org/work/project/cpad-the-california-protected-areas-database; Los Angeles County – Street & Address File, http://egis3.lacounty.gov/dataportal/2014/06/16/2011-la-county-street-centerline-street-address-file/

Park Acres per 1,000 is a common measurement of the number of park acres available in a given area. Because it accounts for population size, this measurement can be utilized across geographic areas to give an understanding of how much park land residents have access to in any given area. Park acres per 1,000 people is measured on a Study Area level, as well as on the level of individual parks (refer to 'Park Pressure'). The County of Los Angeles approved a standard of 4 acres per 1,000 people in the most recent County General Plan.

Park acreage included in the calculations for this metric includes the following types of parkland:

- All parks that are less than 5 acres
- All parks over 5 acres that contain more amenities than just a trail (including regional recreational parks).

Data Sources: Los Angeles County - Age/Race/Gender Population Estimates, 2014; GreenInfo Network – California Protected Areas Database, 2015, http://www.greeninfo.org/work/project/cpad-the-california-protected-areas-database

Park Acres within Study Area: This represents the number of park acres accessible from within the Study Area boundary. In cases where a park is bisected by a Study Area boundary, the total acres of that bisected park are only included in the total available park acres if an access point for that park is located within the Study Area boundary.

Data Sources: GreenInfo Network – California Protected Areas Database, 2015, http://www.greeninfo.org/work/project/cpad-the-california-protected-areas-database; Los Angeles County - City/Community Boundaries, 2015, http://egis3.lacounty.gov/dataportal/2010/10/21/citycommunity-boundaries/

Park Need was evaluated by examining park acre need, distance to park, and population density within each Study Area. Park acre need is defined as the inverse of available park acres: a greater number of available park acres corresponds to a lower level of park acre need, while a smaller number of available park acres corresponds to a higher level of park acre need. Park Need scores were generated using a weighted overlay analysis, with park acre need weighted to contribute 20%, distance to park contributing 20%, and population density contributing 60% to the final park need score. Park Need scores were placed into 5 park need categories: very low, low, moderate, high, and very high. Areas with the highest park need have few available park acres, are a long distance from parks, and have high population density. Conversely, areas with low park need have more available park acres, are closer to parks and are less densely populated.

Data Sources: GreenInfo Network – California Protected Areas Database, 2015 http://www.greeninfo.org/work/project/cpad-the-california-protected-areas-database; Los Angeles County - Age/Race/Gender Population Estimates, 2014; Los Angeles County – Street & Address File,http://egis3.lacounty.gov/dataportal/2014/06/16/2011-la-county-street-centerline-street-address-file/

Park Pressure is the potential demand if each resident of a parkshed were to use the park closest to them. A parkshed is defined by a polygon containing all households having the given park as their closest park. The population within this parkshed is then calculated, providing an estimate of the number of nearby potential park users. The acreage of the park under consideration is then used to calculate the number of park acres available per 1,000 people within the parkshed. Parks with fewer park acres available per 1,000 residents are more likely to experience heavy use.

Various studies report that people are more likely to visit the park closest to them than any other park, and that people tend to visit their closest park more frequently than parks farther away. Thus, the population contained within the parkshed is the population most likely to use the park at the center of the parkshed.

Data Sources: Sister, Chona, Jennifer Wolch and Holn Wilson. Got Green? Addressing Environmental Justice in Park Provision GeoJournal (2010) 75:229-248); GreenInfo Network – California Protected Areas Database, 2015 http://www.greeninfo.org/work/project/cpad-the-california-protected-areas-database; Los Angeles County - Age/Race/Gender Population Estimates, 2014

Pollution Burden: This map shows Pollution Burden scores, which range from 0-10. Pollution Burden scores were calculated by CalEnviro Screen based on seven exposure indicators (Ozone concentrations in air; $PM_{2.5}$ concentrations in air; Diesel particulate matter emissions; Use of certain pesticides; Toxic releases from facilities; Traffic density; Drinking water contaminants) and five environmental effect indicators (toxic cleanup sites; groundwater threats; hazardous waste facilities and generators; impaired water bodies; solid waste sites and facilities). Exposure indicators are used to indicate potential human exposure to pollutants; environmental effect indicators are adverse environmental conditions cause by pollutants.

Data Source: California Office of Environmental Health Hazard Assessment, CalEnviroScreen 2.0 2013, http://oehha.ca.gov/ej/ces2.html, accessed June 5, 2015.

Population is evaluated on a Study Area basis and represents the total number of people living within the Study Area boundary. Los Angeles County population estimate data was processed to distribute populations to a 1 acre grid system so that populations are more accurately represented within each Study Area.

Data Source: Los Angeles County - Age/Race/Gender Population Estimates, 2014

Population Density: Population density is measured as the number of people per acre using a 1-acre grid system approach. The County was divided into 1-acre cells and the population density of each cell was calculated. In areas without population, the population density map appears gray, indicating that the population density in that location is zero, or nearly zero people per acre. These areas are generally commercial areas and industrial areas without residential land use. The data was classified using a quantile-based approach (that is, the number of data points are divided into five equal-sized groups). Higher population density contributes to higher park need.

Data Source: Los Angeles County - Age/Race/Gender Population Estimates, 2014

Population Distribution by Age: The age groups shown in the statistics represent children (ages 0-9); tweens and teens (10-17); young adults (18-24); adults of typical child-rearing age (25-54); older adults (55-65) and seniors (65+).

Data Source: Los Angeles County - Age/Race/Gender Population Estimates, 2014

Population Distribution by Race/Ethnicity: The data on race was compiled from US Census American Community Survey 5 year estimates, and further processed by Los Angeles County to address any data inaccuracies. The U.S Census Bureau collects racial data in accordance to guidelines provided by the U.S. Office of Management and Budget (OMB). This data is based on self-identification. OMB requires that race data is collected for a minimum of five groups: White, Black or African American, American Indian or Alaska Native, Asian, and Native Hawaiian or other Pacific Islander. In all Study Groups with an Asian population of 30 percent or more of the total, information regarding the ethnic groups within the Asian population is also presented. The data used to report information on Asian ethnic groups is from the 2010 US Census, and thus does not reflect any changes to the distribution of these ethnic groups since that time.

Data Source: Los Angeles County - Age/Race/Gender Population Estimates, 2014; United States Census Bureau

Study Area: *The Needs* Assessment divided the County into 188 Study Areas. These were determined based on jurisdictional boundaries, population size, geographic location and incorporation status. Study Areas were used as the basis for data inventory, analysis and community engagement in 186 of the 188 Study Areas. Two Study Areas, Hidden Hills and Rolling Hills Estates, did not participate in the assessment and are not included in the analyses and reporting for the project.

Violent Crime: Violent crimes include any crime of violence in which an offender uses or threatens force upon a victim. This includes both crimes in which the violent act is the objective, such as murder, as well as crimes in which violence is the means to an end. There is no single source for crime statistics in Los Angeles County, as many different agencies have jurisdiction throughout the county. In each Study Area, the best available data is presented.

Data Sources: LA County Sheriff's Department, 2015, http://shq.lasdnews.net/CrimeStats/CAASS/desc.html; City of Los Angeles Police Department, 2015 http://www.lapdonline.org/crime_mapping_and_compstat; Esri, USA Personal Crime, 2014, http://www.arcgis.com/home/item.html?id=b3802d8a309544b791c2304fece864dc

MAPPING AND ANALYSIS PROCESSES

PROCESS FOR CALCULATING PARK NEED AND POPULATION SUMMARY STATISTICS

LOS ANGELES COUNTY COMPREHENSIVE PARKS & RECREATION NEEDS ASSESSMENT, MAY 2016

1. SUMMARY

The Needs Assessment is a data-driven analysis of park need in Los Angeles County. Therefore, it was paramount that the data used in every analysis be the most accurate and up-to-date available. Data was sourced with the input of the Technical Advisory Committee, who provided access to a range of current datasets.

Many of analyses in the Parks Needs Assessment were spatial in nature and examined the relationships between parks, people, and the built environment. Geographic Information Systems (GIS) software was the main tool used to analyze, summarize, and display these spatial relationships and patterns between the various data types.

Analysis results for each Study Area were displayed in the maps, infographics, charts, and graphs contained in the Facilitator Toolkit for each Study Area (see Section 2.3.6 and Appendix X). These data-based graphics became the backbone of the Needs Assessment process, and created a detailed snapshot of the existing conditions in regards to parks, people, and the built environment in each of the 188 Study Areas.

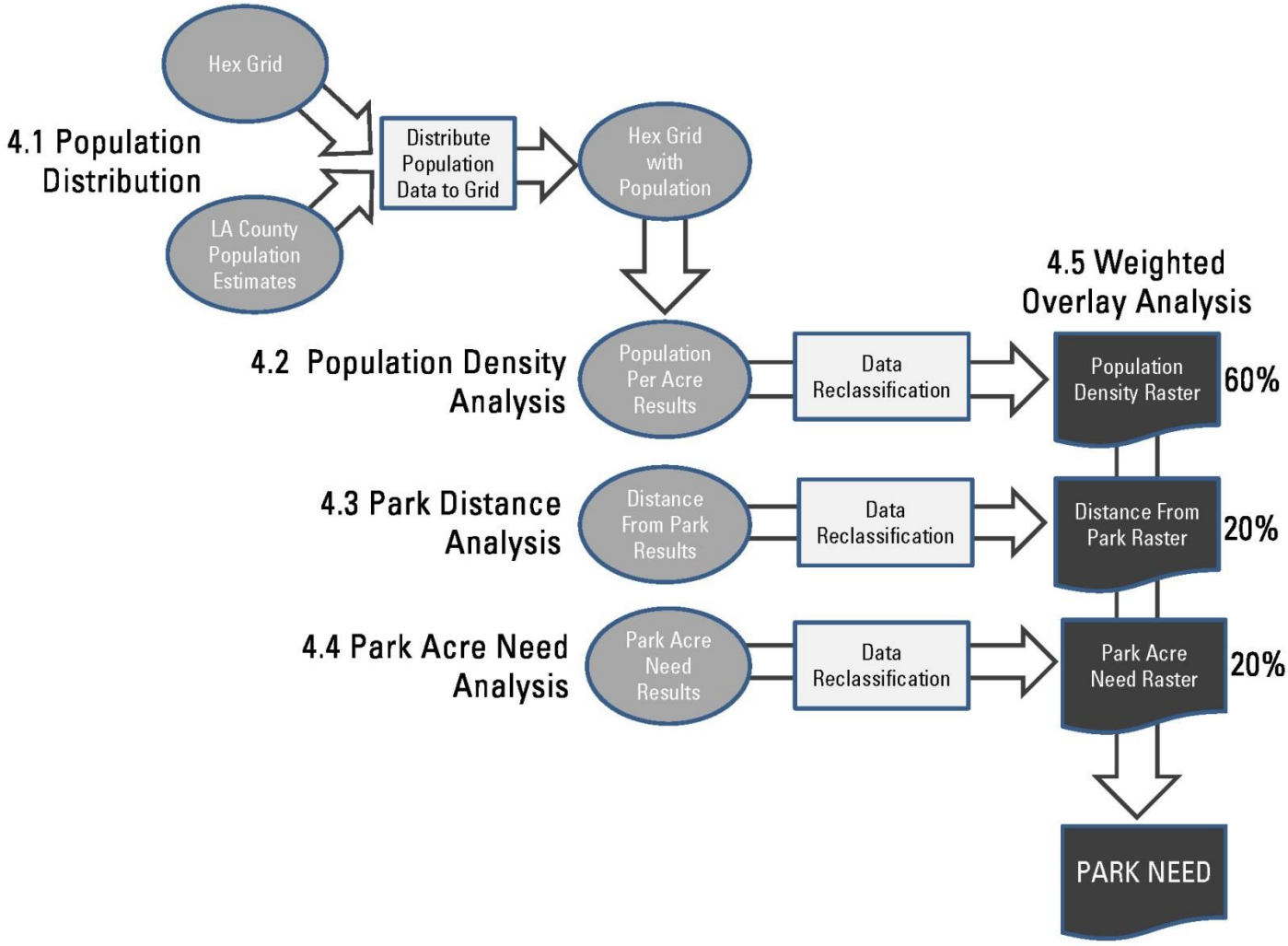
All analysis procedures were presented to and vetted by the project Technical Advisory Committee in three separate meetings. Source information for the data used in the Needs Assessment is available in the preceding section of this Technical Appendix, and as Appendix D of the sample Toolkit. This section of the Technical Appendix will focus on the data and analysis approach in regards to assessing park need across the county.

2. PURPOSE

The question, "Where are parks most needed?" was the driving force behind the analysis and the project as a whole. Answering this question was paramount for the success of the project. To calculate park need, it was important to look at the factors that contribute to park need. After a detailed review of exiting research and analysis methodologies and consultation with the technical advisory committee, the 3 need metrics that would be used for the initial weighted overlay analysis were agreed upon.

The first of these metrics to be analyzed was population density. As the population in an area increases, the need for park acres and amenities increase as well. Distance from park was the second metric that was analyzed. If residents are unable to access a park due to physical barriers or long walking distance, need exists. The third metric was park acre need. The number of park acres residents have access to directly correlates with the need for park acreage, with fewer available acres indicating a greater need.

The focus of this document is to lay out the procedures and methodology used to determine park need across the county. The flow chart on the next page outlines the process presented in the methodology section of this technical appendix.



It was understood that a number of other factors can create park need; however, the focus of the Parks Needs Assessment was the physical characteristics of parks and their locations, not socioeconomics or environmental factors. These types of data were analyzed separately and provided as supplemental information but do not factor into the park need equation.

Following the weighted overlay analysis which created a richly detailed map of need in each of the 188 study areas, it was necessary to summarize this information and determine a single level of park need for each Study Area. This process is laid out in detail in the Park Need Framework section of the report.

3. DATA LAYERS

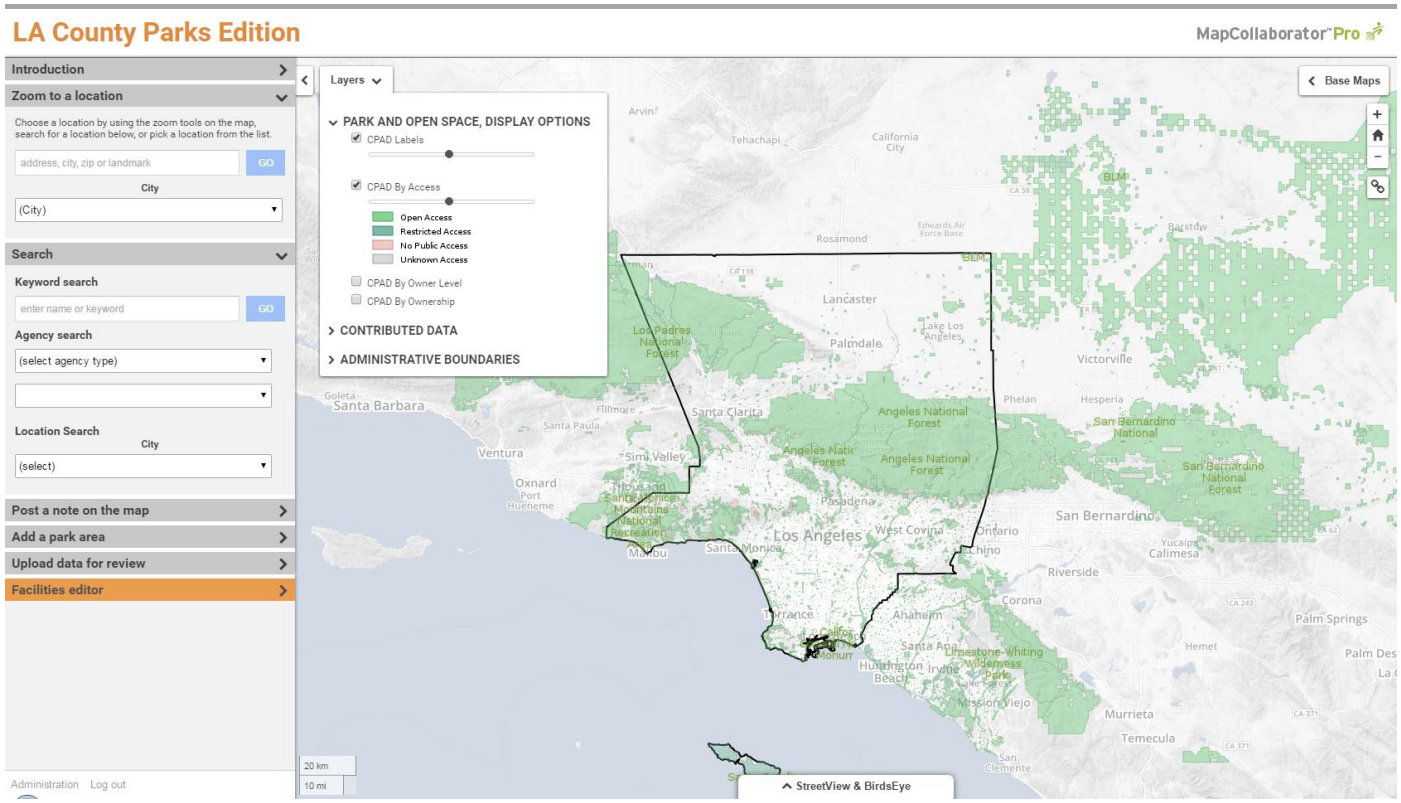
As stated above, population, park access and park acres were determined to be the most important factors in calculating park need. It was paramount that the data used in every analysis be the most accurate and up-to-date available. The analysis required additional layers of information beyond the core parks and population data. Since access was solely determined using walking distances, a detailed walkable network was developed for the entire County as well as a park access point layer which created an accurate depiction of park access for each park. Existing land use was also of interest in the process of distributing population and the 2015 Los Angeles County Assessors data was the most up to data source for this information. A detailed breakdown of each layer that was used in the analysis is as follows:

3.1 POPULATION

Accurately documenting the quantity of residents and the location of households within Los Angeles County was critical for many of the spatial analyses completed as part of the Needs Assessment. The most accurate population data available at the time of the Needs Assessment was the 2014 Los Angeles County Age/Race/Gender Population Estimates. These population estimates originate with the 2014 American Community Survey Population Estimates from the U.S. Bureau and are adjusted annually by both the County and the California State Department of Finance improve accuracy. This data is provided on a census tract level.

3.2 PARKS

The parks data used in the Needs Assessment was gathered through the Park Assets Inventory Web Portal (refer to Section 1.3.3 for additional detail). The park assets inventoried through this interactive portal were reviewed in detail and reconciled against aerial and assessor parcel data for location and acreage. Parks were then categorized into four distinct categories. Local Parks, Regional Recreation Parks, and Regional Open Space are included in all levels of analysis. The fourth category, Natural Areas, did not have any reported amenities and were not included in the park distance/park acre need analysis. However, they are displayed on all maps in order to provide context.

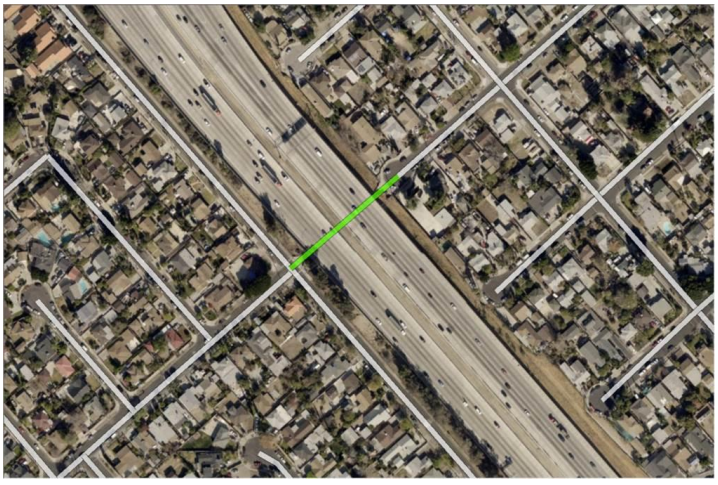


3.3 PARKS ACCESS POINTS

Park access points were developed for every Local Park, Regional Recreation Parks, and Regional Open Space. Determining key access points around each park allowed for accurate representation of service areas around each park. For parks less-than 1 acre in size, the centroid of that park was used as its access point. For parks larger than 1 acre, multiple access points were placed in order to accurately tie park access to the walkable network.

3.4 WALKABLE ROAD NETWORK

The walkable network was developed to accurately depict walking paths to and from parks. A 2015 version of Open Street Maps Data was used as a starting point due to the inclusion of pedestrian walking paths including stairs, breezeways, alleys, pedestrian over crossing, etc. Great care was taken to insure that all freeway pedestrian overcrossings throughout the County were included in the walkable network. Since the park access analysis was focused on park walkability, all freeways, on/off ramps and other vehicle only paths of travel were removed from the dataset.

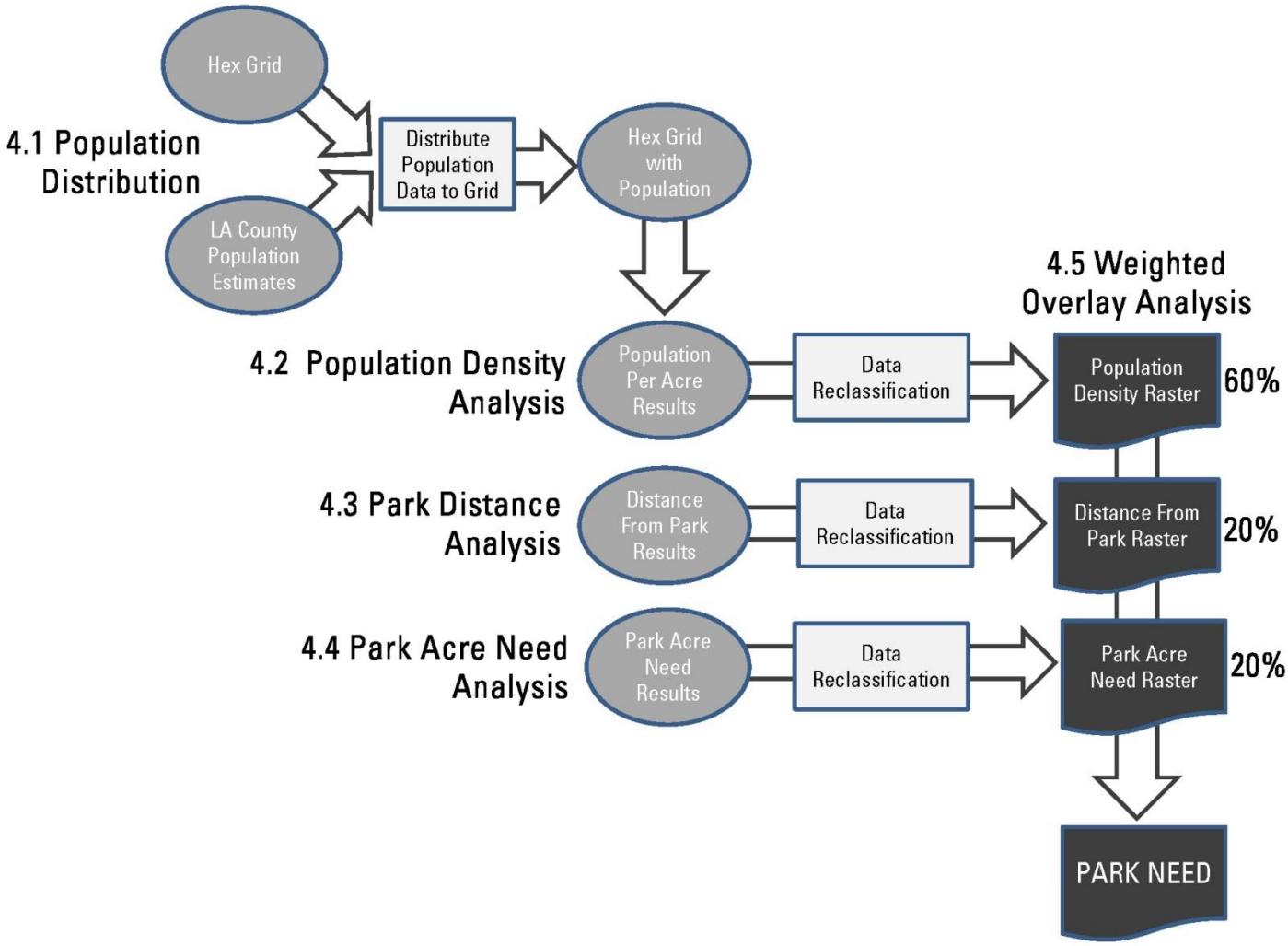


3.5 LOS ANGELES COUNTY ASSESSOR DATA (2015)

Los Angeles County Assessor data dated March 2015, was utilized for both vacant land analysis as well as for determining existing land use for the distribution of population to the hexagon grid.

4. METHODOLOGY

This section will explain the analysis methodology used for each indicator used in the park need equation as well as the weighed overlay process to determine park need. Distribution of population and population density, park acre need, park distance, and weighted raster overlay will be explained in detail. It may be helpful to review the analysis flow chart again before continuing.



4.1 POPULATION DISTRIBUTION

Who and how many people live where?

To improve the accuracy of the spatial analyses completed for the Needs Assessment, a probable distribution of population within each census tract was developed. This was accomplished by dividing the entire County into a one-acre hexagon grid. Population was then distributed among the grid cells within each census tract based on the underlying Los Angeles County Assessor's parcel land use type. This technique pushed the population to the areas where people are most likely to live, in an attempt to more accurately summarize the spatial location of the population within specific analysis areas. For example, in a census tract with a golf course, the total population of the census tract was distributed only

among those hexagons that are not on the golf course. Likewise, if a census tract has undeveloped land or industrial parcels, the population was not distributed to hexagons in those areas. In consultation with the Technical Advisory Committee, it was decided to use the 2014 Los Angeles County Age/Race/Gender Population Estimates, as this was the most accurate data available.

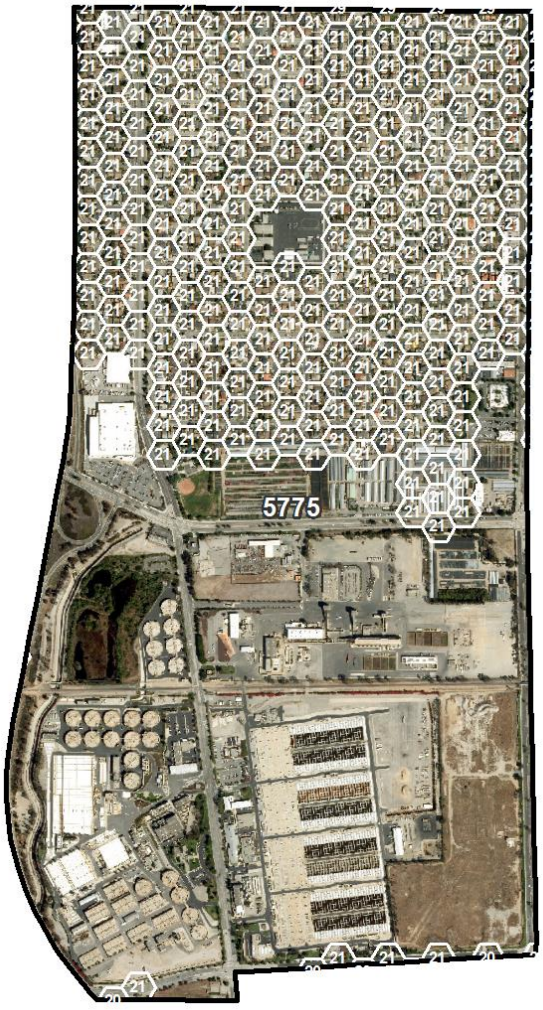
Once the population was distributed to the areas of each census tract most likely to have residents living it, the data was used in all subsequent analyses involving population, including density, park access and park pressure, among others. The accuracy of each of these spatial analyses was improved by the use of this finely detailed data on the location of population throughout the County. This population grid provided an easy way to summarize population numbers for various geographies. For instance, coding each grid cell with the Study Area is falls within and each grid cells distance to the nearest park using the results of the park service area analysis, one can summarize the total number of people that have walkable access to a park for each Study Area

4.1.1 POPULATION DISTRIBUTION: RESULTS

Data Utilized: One acre hexagon grid, 2015 Los Angeles County Assessor Data, and 2014 Los Angeles County Age/Race/Gender Population Estimates

SAMPLE

In the following image (below, left) 5775 people live within the Census Tract boundary and the southern portion of the Tract is made up of industrial land uses. The hex grid cells shown in the northern section of the tract are the only grid cells that support population. There are 275 grid cells in this section. Thus, 275 grid cells support the population of 5775 people living within the tract boundary. Dividing 5775 by 275 in the table distributes 21 people into each cell. This same calculation was not only run on the total population but all age and ethnic group numbers in the 2014 Los Angeles County Age/Race/Gender Population Estimates data as well.



Other Sample Graphics

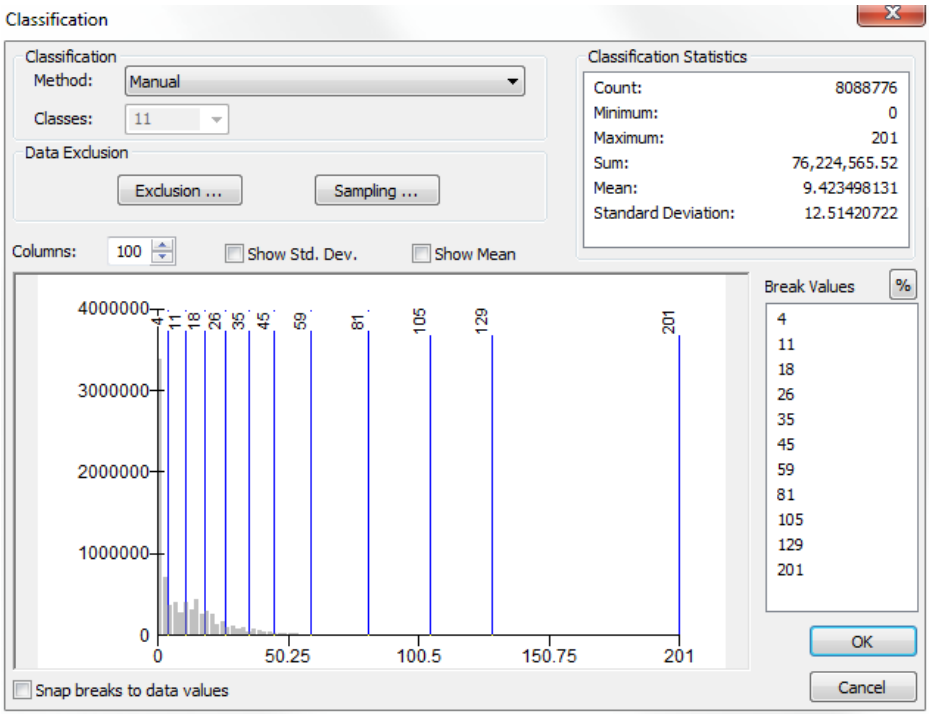
4.2 POPULATION DENSITY ANALYSIS

Data Utilized: One acre hexagon grid with 2014 Los Angeles County Age/Race/Gender Population Estimates

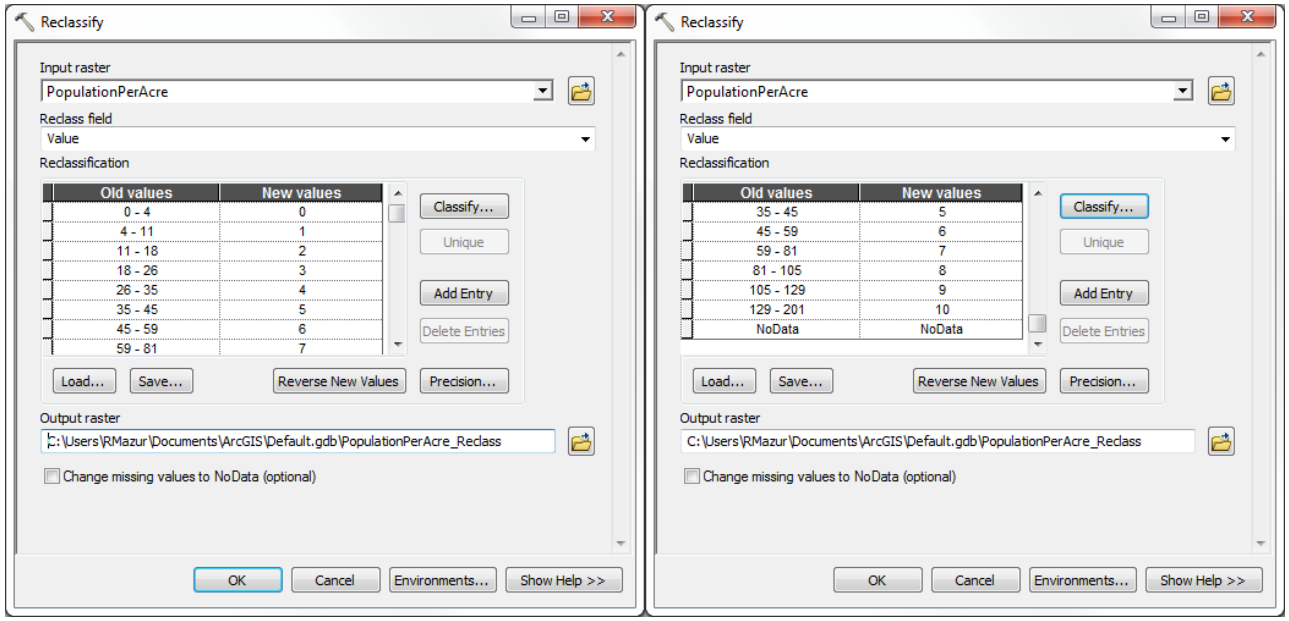
As stated in the purpose section of this appendix, as the population in an area increase, the need for park acres and amenities increase as well. The results of the above population distribution produced a one acre grid containing the number of people per acre. This information was used to calculate population density across the entire county.

4.2.1 DATA CLASSIFICATION

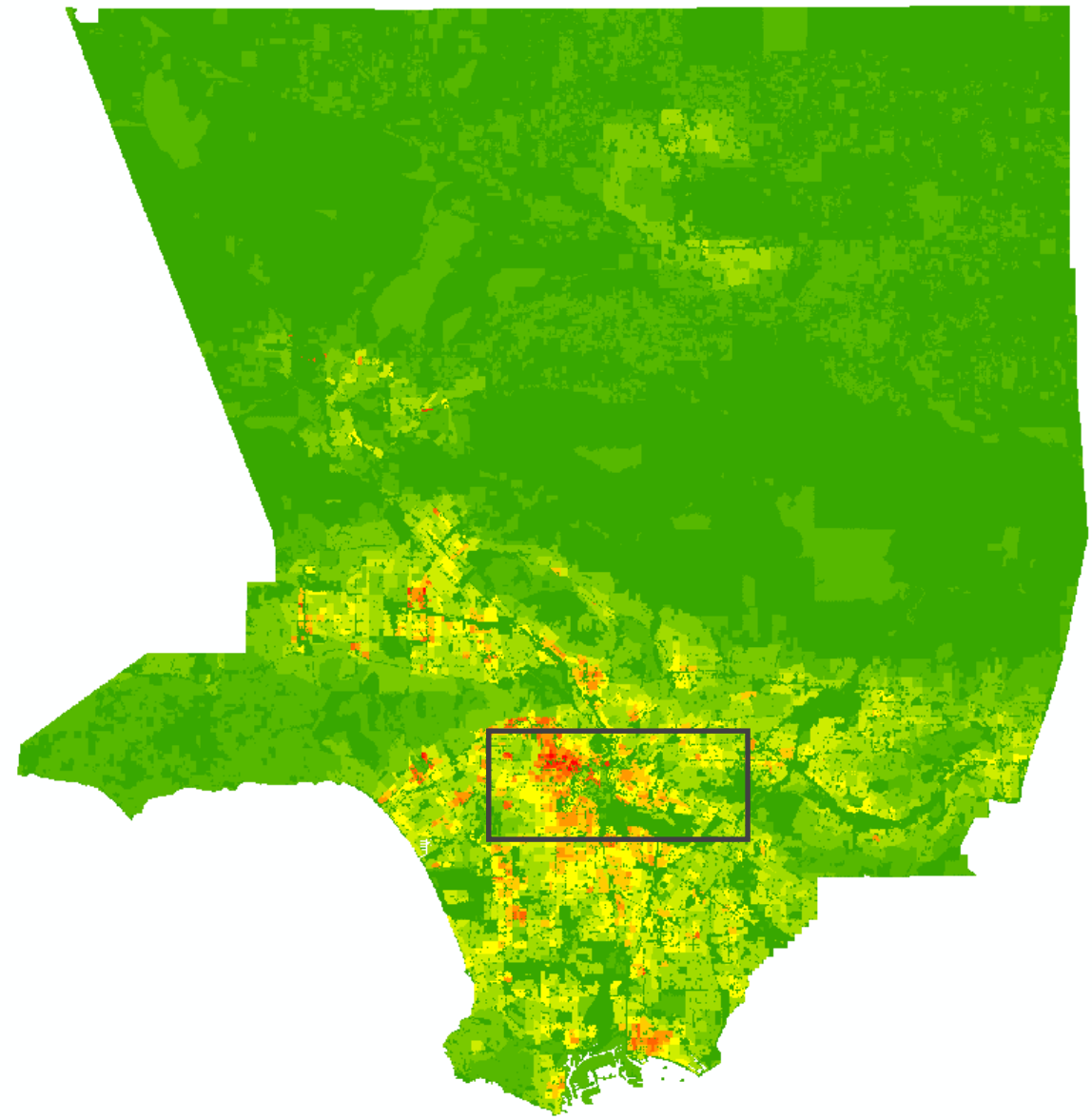
The hexagon grid based population data was rasterized, classified, and reclassified as follows. Original values = people per acre. Base classifications were based on natural breaks and rounded to the nearest whole number.

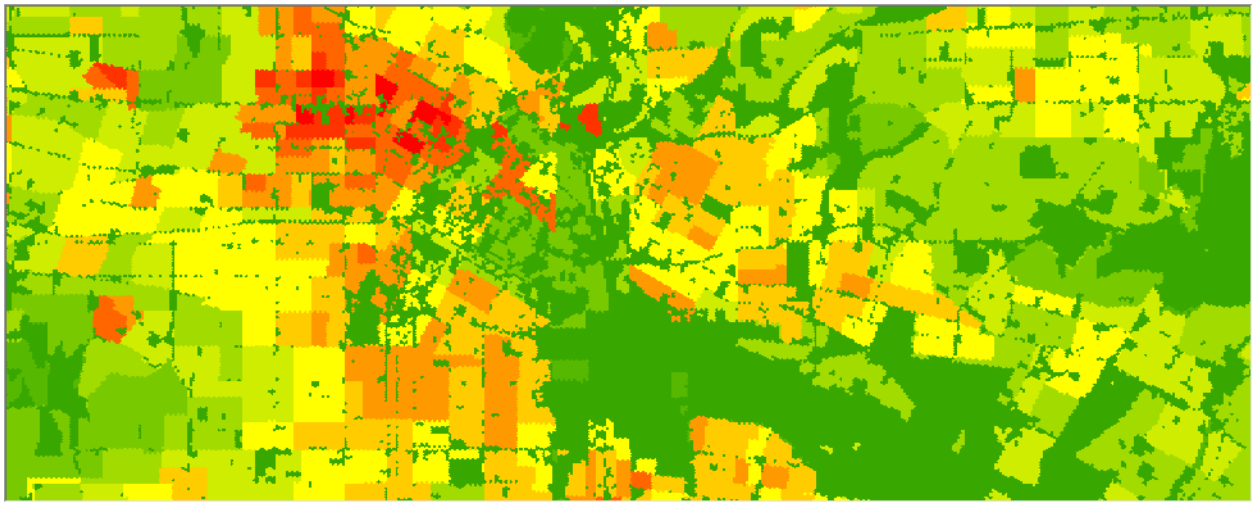


Data was then reclassified at follows.



4.2.2 OUTPUT: POPULATION DENSITY





4.3 PARK DISTANCE ANALYSIS

How close is the nearest park?

Data Utilized: Walkable Road Network Dataset, Park Access Points
Analysis Tools Utilized: ArcGIS Network Analyst and 3D Analyst

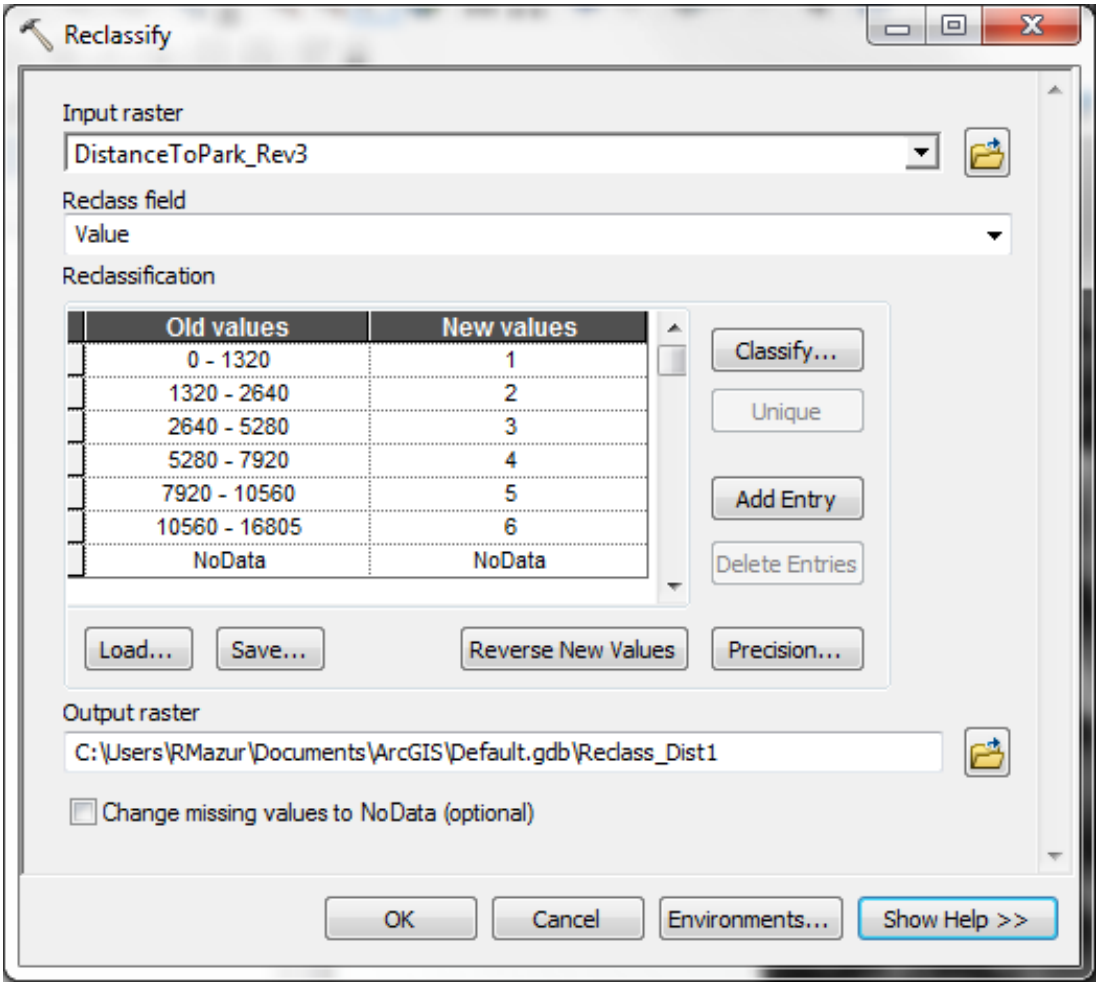
The distance from each household in the Study Area to adjacent parks was calculated along the walkable road/pedestrian network rather than "as the crow flies." Measuring distance along routes that a pedestrian could travel gives a more accurate representation of the distance to a park. Since pedestrians cannot safely or legally walk on highways, these barriers were taken into consideration when calculating the distance to a park. Data was classified into 6 categories based on the following distance thresholds: ¼ mile, ½ mile, 1 mile, 1 ½ miles, 2 miles, and more than 2 miles. Households farthest from a park have the least park access, and those closest to a park have the most park access.

The results of the park access analysis were presented in two forms: 1) as a percentage of the population of a Study Area and countywide living within ½ mile of a park; and 2) as a map showing which locations in a Study Area are closest and farthest from a park. The latter categories were used in the weighted overlay analysis.

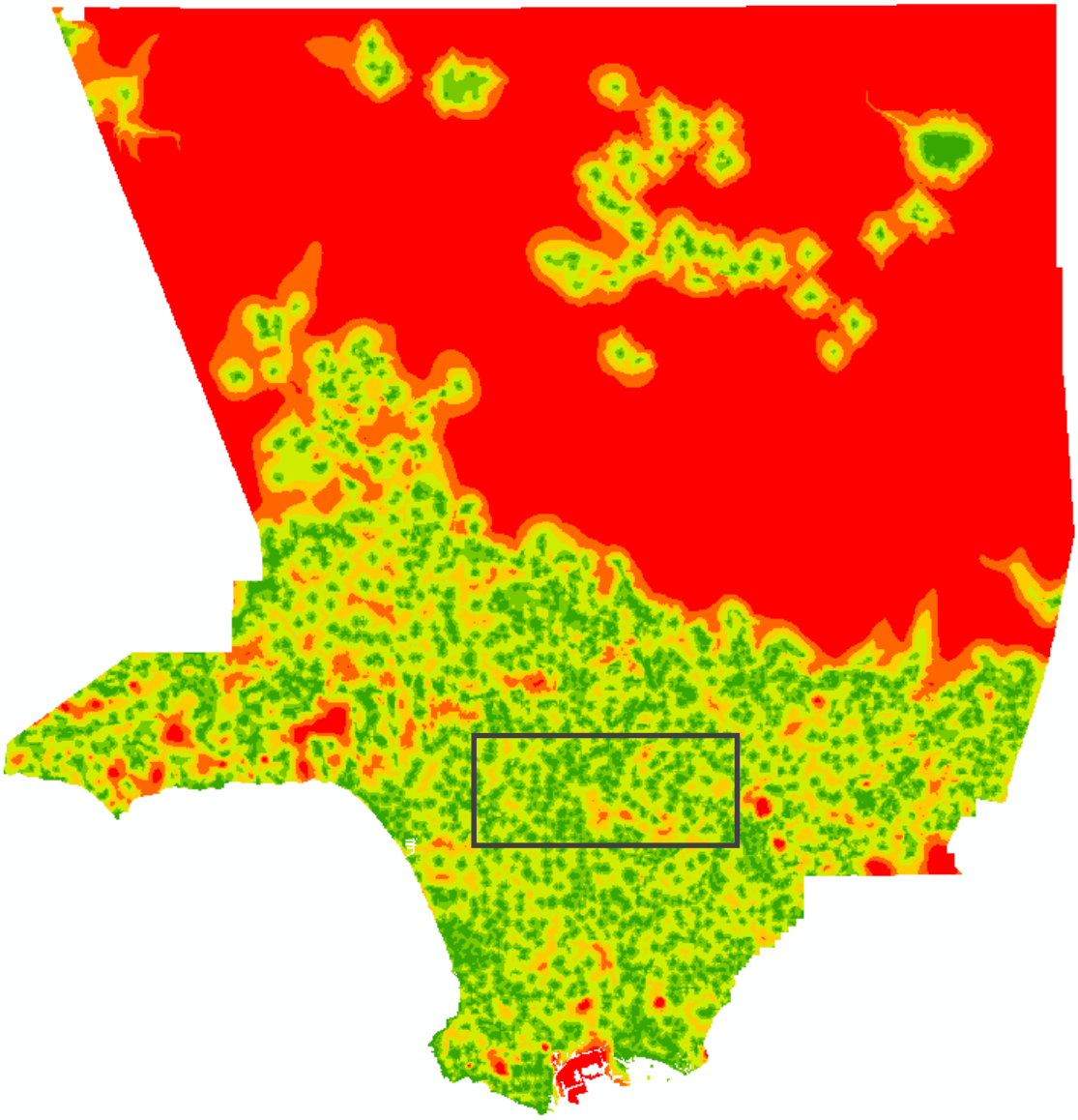
Please note that natural areas were not included in this analysis. Local parks, regional recreation parks, and regional open space are included, but since natural areas do not have any reported amenities, they were not included in the park distance analysis.

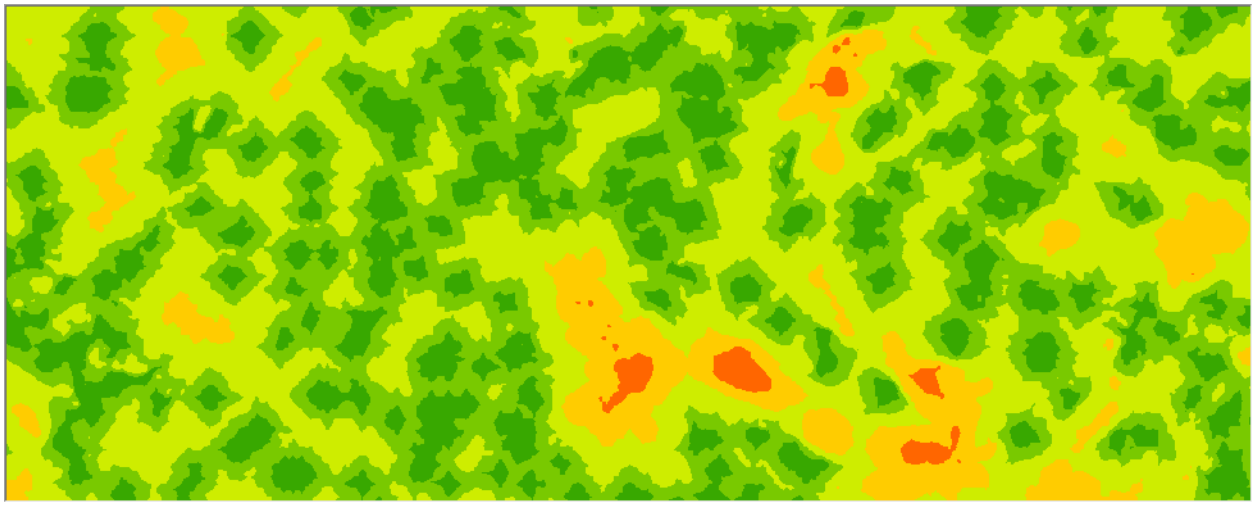
4.3.1 DATA CLASSIFICATION

Once the network based analysis was complete the output file was rasterized and reclassified as follows based on walking distances. Original values = walking distances in feet.



4.3.2 OUTPUT: PARK DISTANCE





4.4 PARK ACRE NEED ANALYSIS

How many acres of park do residents have access to?

Data Utilized: Park Access Points, Hexagon Grid Points
Analysis Tools Utilized: Spatial Analyst

Park Acre Need was calculated by assigning a park service area to each existing park, based on park acres and park type category. Service area distances were loosely based on DPR's service area standards for parks. Populations located within the service area of a park are considered to have all those park acres available to them. The park service areas used were as follows: 3 acre or smaller park: ¼ mile service area; 3-10 acre park: ½ mile service area; more than 10 acres or special use facilities: 2 mile service area. The typical service area for Regional Recreation Parks is 25 miles, since the focus of this analysis is on walkability, a 2 mile service area was used for these parks. Populated areas two or more miles from a park are represented as having 0 park acres available to them.

County General Plan Park Type	Park Acreage	Service Area Distance
Park Node	< 0.25	0.25 miles
Pocket Park	0.25 to < 3 Acres	0.25 miles
Neighborhood Park	3 to 10 Acres	0.5 miles
Community Park	10 to 20 Acres	2 miles
Community Regional Park	20 to 100 Acres	2 miles
Regional Park	> 100 Acres	2 miles
Special Use Facility	N/A	2 miles

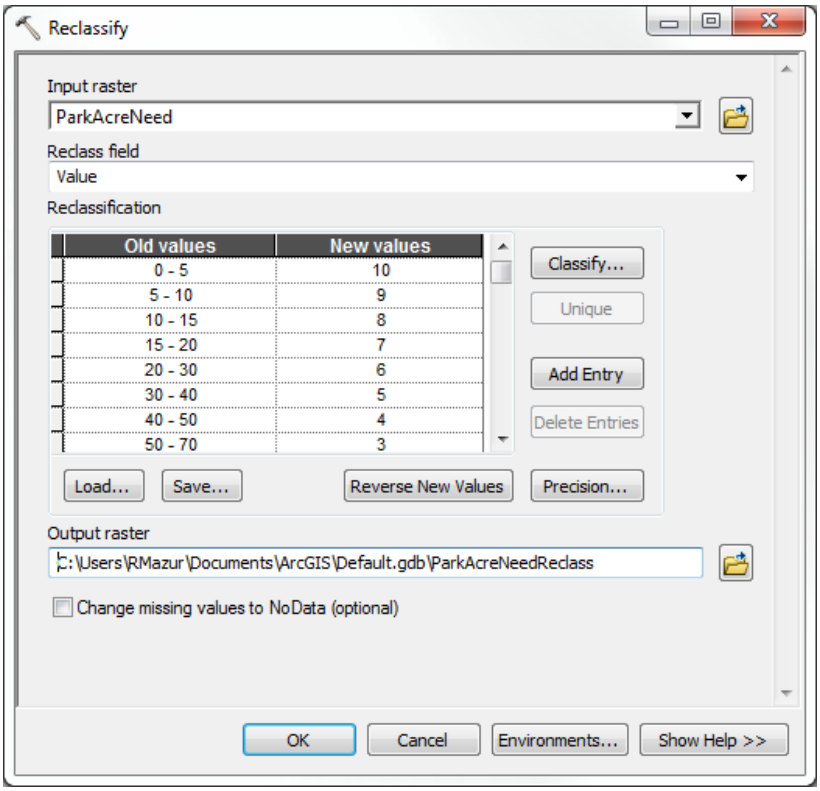
Populations within 2 miles of a park are given the total number of acres they have access to. For example, if a household is within a half mile of Park A (5 acres) and a quarter mile of Park B (2.4 acres) it will be represented as having access to 7.4 acres of park land. This analysis is not confined to Study Area boundaries, so park acreage in adjacent Study Areas can be considered available to any population within the park's service area.

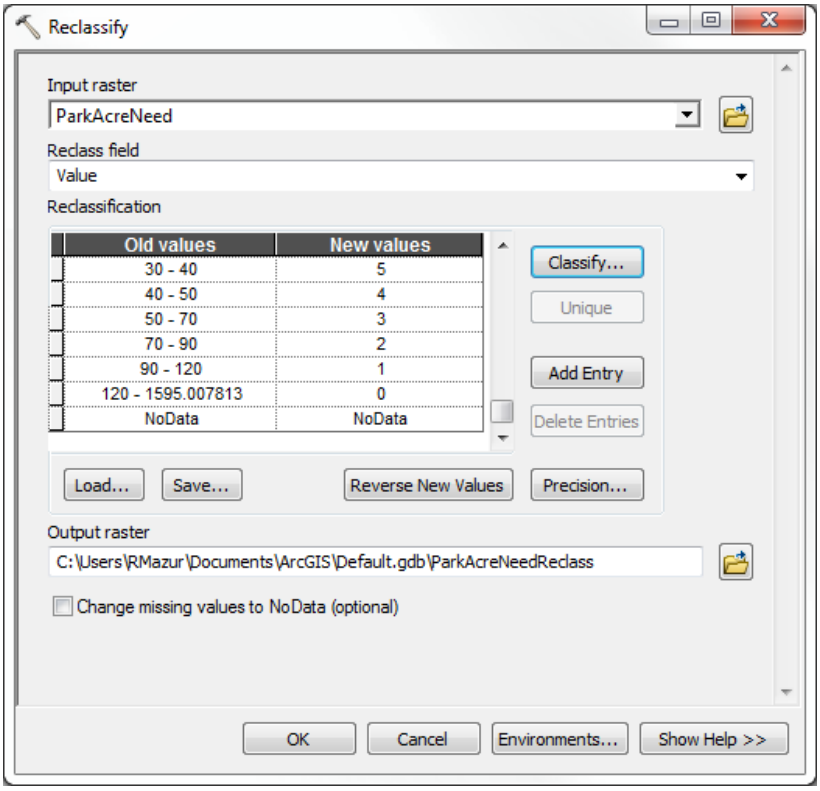
The results of the Park Acre Need analysis were used to show the level of need for park acres across the County, with areas with few acres of park categorized as having a high park acre need and areas with many park acres categorized as having very low park acre need. These results were also included in the weighted overlay analysis.

Please note that natural areas were not included in this analysis. Local parks, regional recreation parks, and regional open space are included, but since natural areas did not have any reported amenities, they were not included in the park acre need analysis.

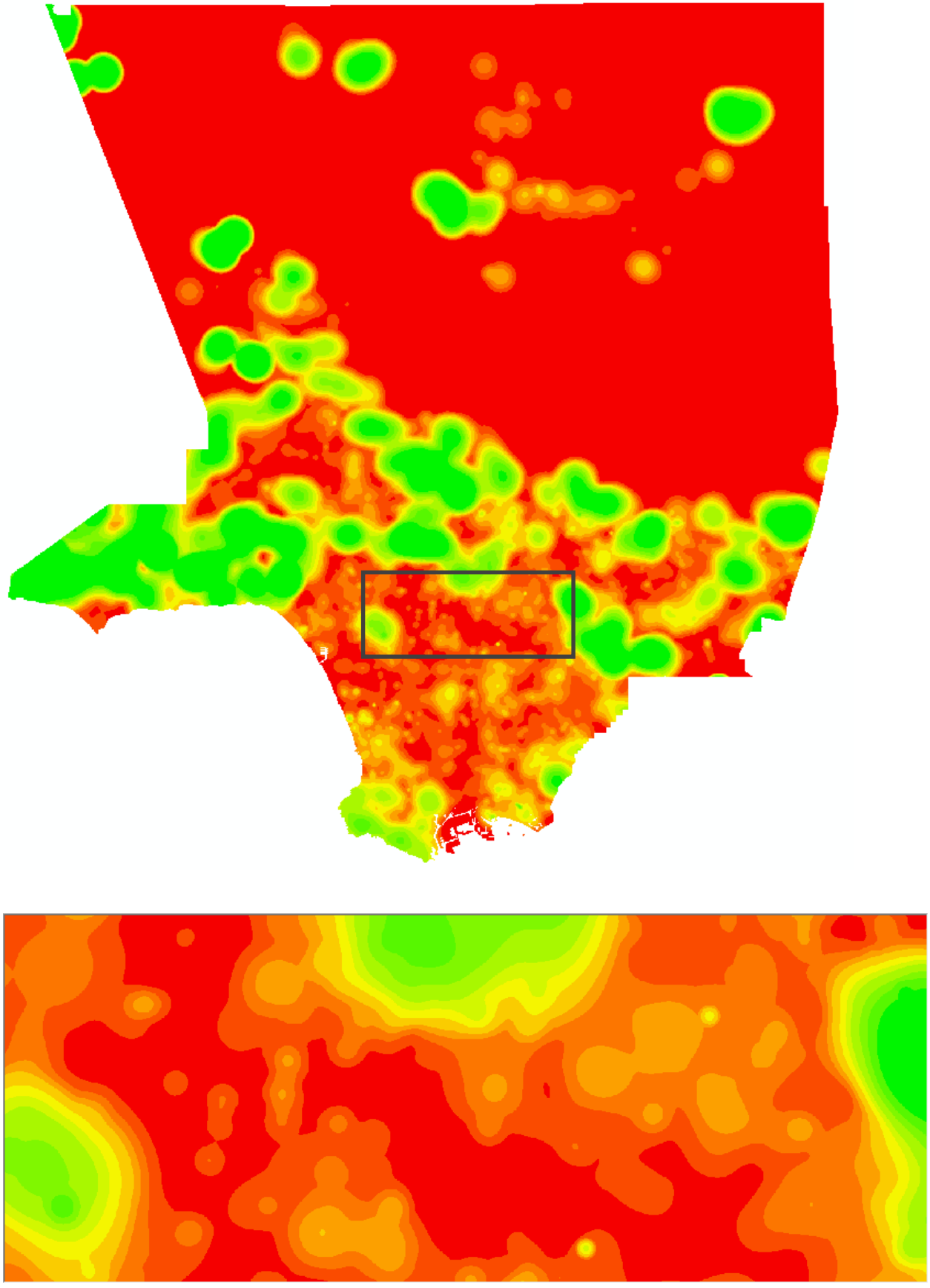
4.4.1 DATA CLASSIFICATION

Once the spatial analysis was complete the output file was rasterized and reclassified as follows to determine the park acre need across the County. Original values = available park acres.





4.4.2 OUTPUT: PARK ACRE NEED

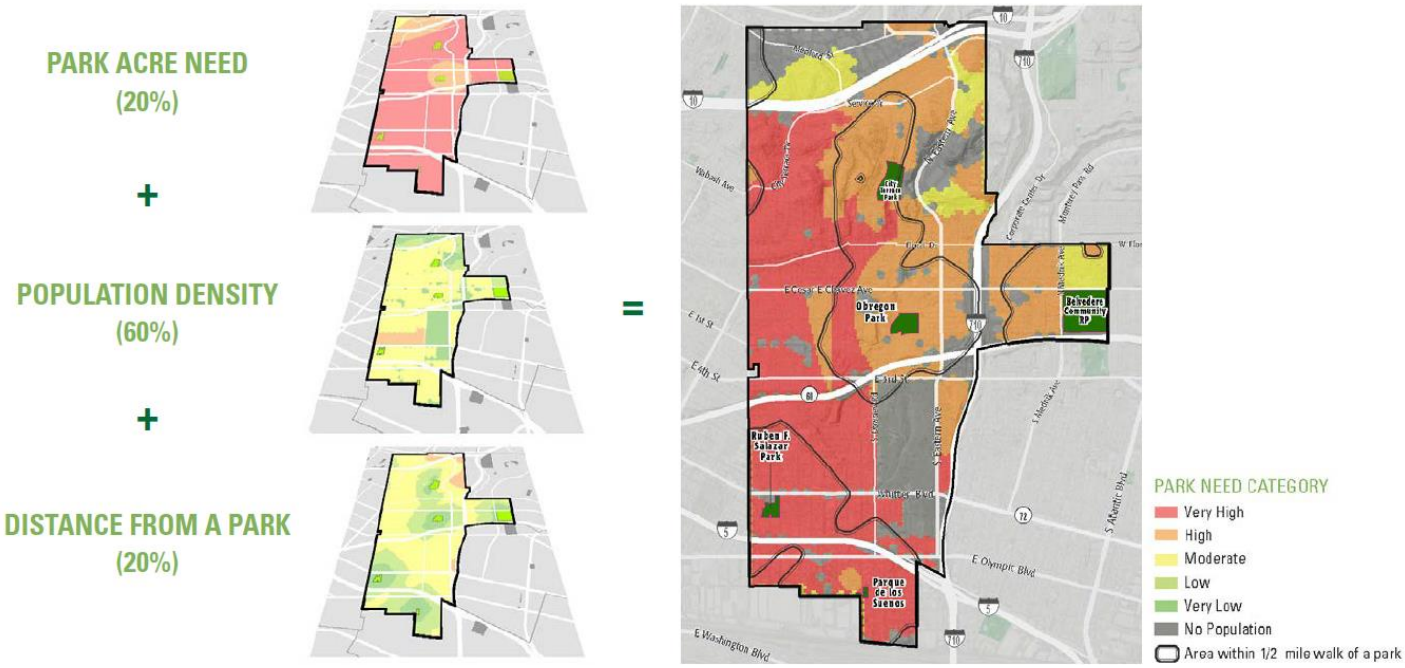


4.5 WEIGHTED OVERLAY ANALYSIS

Where are parks most needed?

Data Utilized: Reclassified Raster Outputs from the results of the Park Access, Available Acres, and Population Density Analysis
Analysis Tools Utilized: Spatial Analyst

Now that the subsequent analysis has been run, and outputs reclassified to a common measurement scale, it is necessary to overlay and weight each layer according to its importance. Combining the information from these three maps (park acre need, population density, park distance), creates a new map that identifies where parks are most needed. Areas with the combination of few available park acres, far from existing parks, and a high population density have a greater need for parks than areas with many available park acres, close to existing parks and with low population density. To create the map of where parks are most needed, each layer of information was weighted; with population density assigned the most weight. Population density greatly affects the number of acres of park available in any given area and is unaffected by the creation of new parks. New parks can be built to increase the number of park acres and decrease the distance people live from parks, and thus these two layers of information were given less weight. This weighting of layers was reviewed by the Steering Committee.

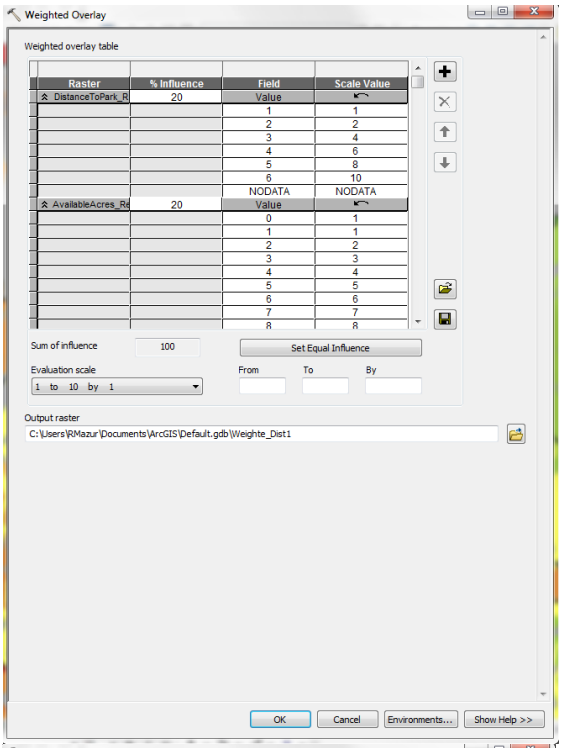


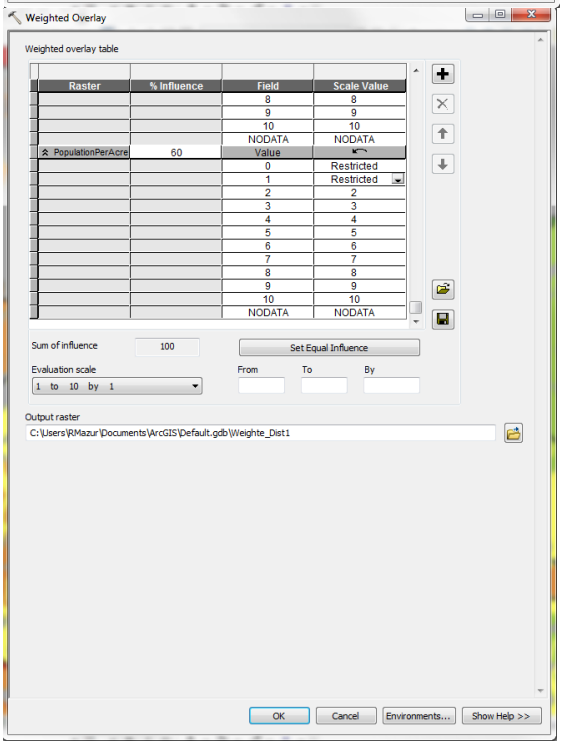
4.5.1 ANALYSIS METHODOLGOY

This analysis was done using the Weighted Overlay tool in Spatial Analyst. The final parameters set in the tool can be found below.

Weighted Overlay Parameters

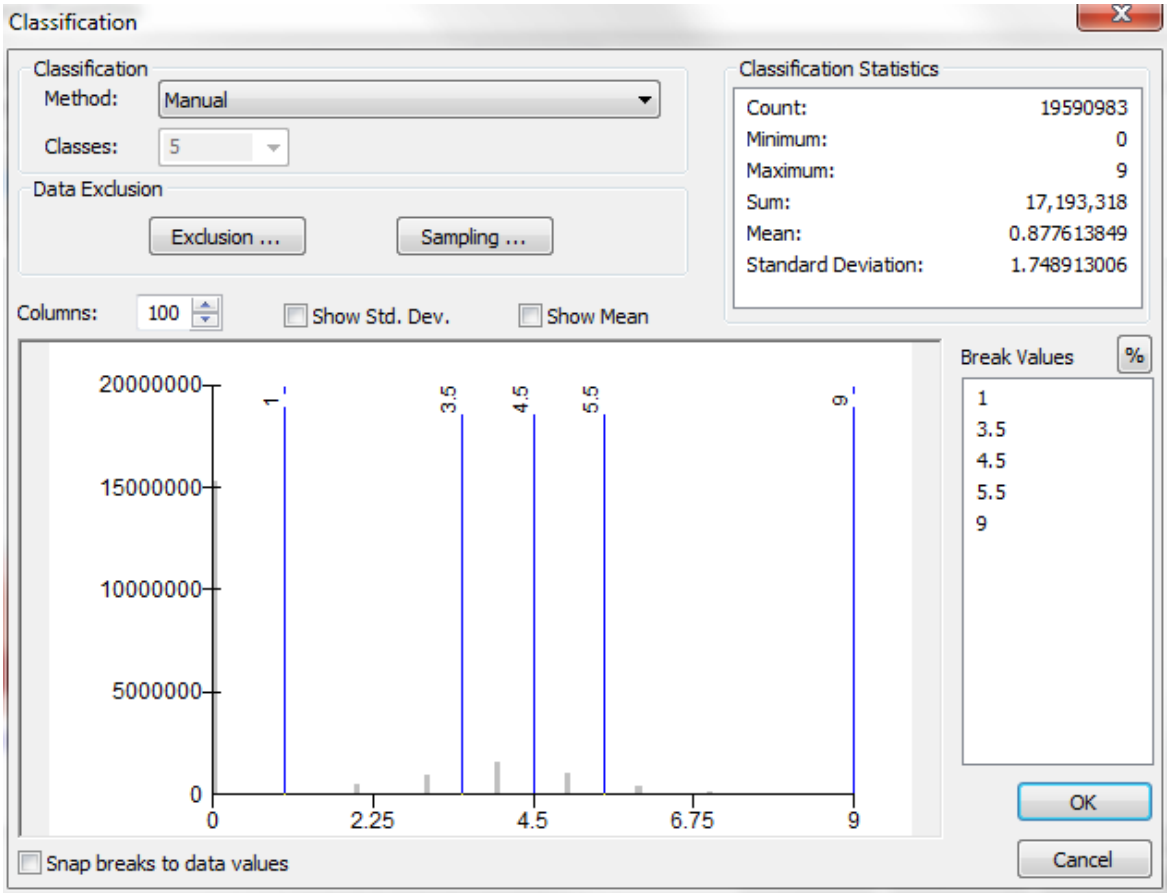
Raster	% Influence (Weight)	Cell Value	Scale Value
DistanceToPark_Reclass	20	1	1
		2	2
		3	4
		4	6
		5	8
		6	10
		No DATA	NO DATA
Raster	**% Influence (Weight)**	**Cell Value**	**Scale Value**
ParkAcreNeed_Reclass	20	0	1
		1	1
		2	2
		3	3
		4	4
		5	5
		6	6
		7	7
		8	8
		9	9
		10	10
		NO DATA	NO DATA
Raster	**% Influence (Weight)**	**Cell Value**	**Scale Value**
PopulationDensity_Reclass	60	0	Restricted
		1	Restricted
		2	2
		3	3
		4	4
		5	5
		6	6
		7	7
		8	8
		9	9
		10	10
		NO DATA	NO DATA

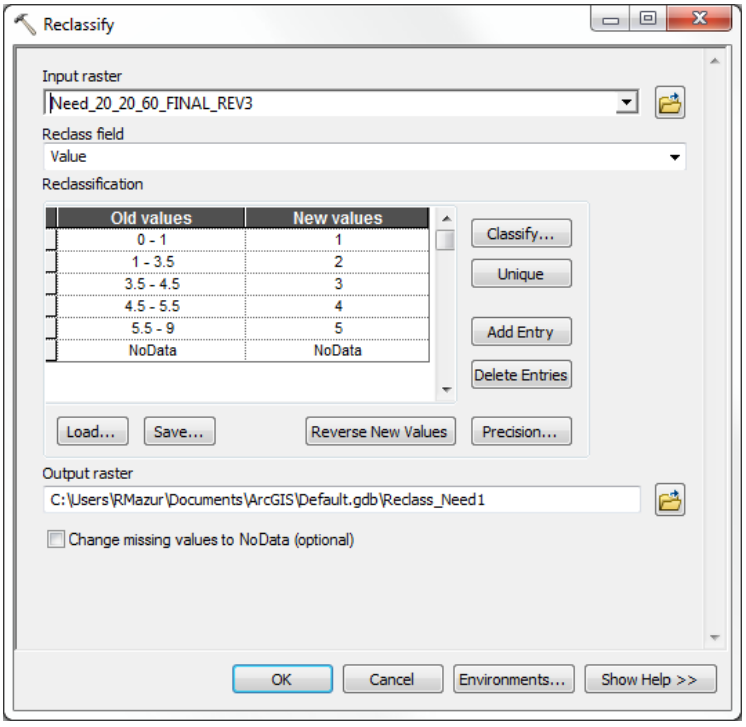




4.5.2 DATA CLASSIFICATION

The data results of the weighted overlay analysis were classified and reclassified as follows.





COST ESTIMATE ASSUMPTIONS

1. PROJECT LIST COST

- A new park request counts as 3 points and consists of:
    1. Land acquisition
    2. General infrastructure
    3. 2 amenities
        - If specific amenities were not requested, the average cost of standard amenities (excluding those with buildings) was used
- If the size of a requested new park is not specified, we infer the size of the park based on the amenities requested. The following park sizes were determined:
    - Pocket – 0.5 acres
    - Neighborhood – 3 acres
        - Contains 1- 2 amenities
    - Community Park – 5 acres
        - 3 or more amenities
        - Contains multiple sports fields
    - Regional- 10 acres
        - Contains equestrian amenities, or other large amenities.
- Sizes of parking lots were assumed as follows:
    - 25% of "Pocket"-sized park
    - 20% of "Neighborhood"-sized park
    - 10% of "Community"-sized park
    - 10% of "Regional"-sized park
- Landscaping of a park is assumed to be 75% of the total park area.
- Trees in a park are assumed to be 25% of total park area.
- General Infrastructure includes restrooms and any repair or replacement of existing infrastructure is assumed to be 50% of the total park area.

*Landscaping and general infrastructure does not add up to 100% because they are not mutually exclusive and can overlap.

2. TOTAL COST

- Overlap
    - To calculate overlap, any projects and deferred maintenance costs that were identical had 1 cost allocated to the overlap to be subtracted from the total cost. For any overlapping deferred maintenance cost/project item that had slightly different costs, the lowest cost is subtracted from the total cost and the highest cost is taken into the total cost.
- Adding a new amenity or replacing an amenity will be the same cost.
- The cost to repair an amenity is 10% of its replacement costs.
- Summing study area costs will not equate county total costs because some parks may service more than 1 study area.