LA Gardens:

Mapping to Support a Municipal Strategy for Community Gardens

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Introduction

Food security and food quality are important issues facing the diverse communities of the City of Los Angeles. Access to affordable and healthy foods, especially fresh fruits and vegetables, is difficult for many residents. Time and money constraints often compound the dearth of grocery stores in lower-income and inner-city neighborhoods. In so-called "food deserts" (Cummins and MacIntyre 2002, Beaulac et al. 2009, Gordon et al. 2011), many residents turn to prepared foods and fast food. The epidemic of childhood obesity is in part related to these food choices. At the direction of Mayor Antonio Villaraigosa, the City of Los Angeles established a Food Policy Task Force to develop a set of recommendations published in the Good Food For All Agenda Report (September 2010). The report outlines strategies for developing opportunities for healthy, good food that is accessible to all, regardless of income level, including increasing the number of community gardens.

One means to improve access to affordable fresh food is the development of community gardens where residents can grow their own fruits and vegetables. Gardens have achieved a high public profile in the past few years, due no doubt in part to Michelle Obama's enthusiastic promotion of community and school gardens. Gardens are not, however, a new response to food insecurity in U.S. cities; rather over the past century and a quarter urban gardens have been periodically sponsored by governmental and philanthropic institutions in response to economic downturns and wartime food shortages (Kurtz 2001). Viewed as a source of supplemental nutrition rather than a panacea to hunger, community gardens have the potential to improve access to healthy and affordable foods in urban neighborhoods. Moreover community gardens are sites that promote improved mental health, physical activity, and community development (Armstrong 2000, Wakefield et al. 2007).

Currently we are aware of 42 community gardens located throughout the City of Los Angeles. While little is known about these gardens, it is apparent that they are not the results of any citywide, coordinated effort. Rather, they likely emerged opportunistically and owe their existence to the efforts of a variety of non-profit organizations, university extension offices, interested members of the public, and city officials. The absence of any strategy around community gardens is a hindrance to the establishment of more gardens to meet the extensive need for fresh, healthy food in low-income Los Angeles neighborhoods.

This report describes the results of a project undertaken to develop such a strategy. Concentrating on the Community Development Block Grant (CDBG) regions within the City of Los Angeles, the project team (1) developed an index to identify areas in greatest need of improved access to fresh, healthy, affordable foods; (2) identified potential locations for new community

gardens; (3) identified regions where it may be inadvisable from a health perspective to locate gardens; and (4) produced a set of online tools to facilitate the public's use of these findings. The findings from this project represent an objective way to consider the issue of food insecurity in Los Angeles and to quantify the need for intervention via community gardens and other resources. Among other things, findings suggest high levels of need in several northern San Fernando Valley neighborhoods, a part of Los Angeles that is consistently ignored in public discourse about food security and community gardens.

The following section details the methodological approach to the above activities, followed by a discussion of project findings and the implications of these findings for addressing food insecurity in Los Angeles via community gardens.

Methods

The first phase of this project involved an investigation of all City of Los Angeles community development block grant (CDBG) areas in order to suggest neighborhoods most in need of fresh, affordable food, and to suggest potential locations for new community gardens. We approached this objective by developing three assessments of CDBG areas, termed the "landscape of need," "potential siting considerations," and "landscape of opportunity." Together, these assessments — in the form of maps — are intended to guide decision-making on which neighborhoods and which specific locations within those neighborhoods might be prioritized for community garden development.

Landscape of Need

This map integrated seven measures of need that were suggested by the scholarly and gray literatures and city policy and planning documents to be common or important considerations in community garden location strategy, and that were deemed as priority considerations by the Los Angeles Neighborhood Land Trust and Commissioner of Public Works. These variables include: population density (Herbach 1998, City of Sydney nd, Woollahra Municipal Council nd); percent population below poverty (Seattle Department of Neighborhoods nd); median income; percent population 17 years old and under; percent population 65 years old and older; existing grocery stores, farmers markets, and community gardens; and results from the FITNESSGRAM, an at-school assessment of students' fitness levels. Table 1 displays the relationship between each variable and need.

Table 1. Relationship between seven indicators and need for community gardens

Variable	Relationship to need
Population density	Higher density = greater need
Percent population below poverty	Higher % below poverty = greater need
Median income	Lower median income = greater need
Percent population 17 and under	Higher % 17 and under = greater need
Percent population 65 and over	Higher % 65 and over = greater need
Grocery stores, farmers markets, community gardens	Absence of these features = greater need
Obesity / physical fitness	Higher percent = greater need

Data collection and analysis was confined to CDBG areas (including a 1-mile buffer to avoid edge-effects) within the City of Los Angeles. Data at the 2000 U.S. Census block group level for percent population 17 years old and under, percent population 65 years old and older, and population density per square mile were obtained from Environmental Systems Research Institute (ESRI) Data and Maps CD (source: Tele Atlas North America and U.S. Census Bureau). Percent below poverty was calculated (*P087002 / P087001*) from Summary File 3 (SF 3) tables downloaded from the U.S. Census Bureau (see http://census.gov for more information). Median household income, calculated by Tele Atlas North America and ESRI, at the 2000 U.S. Census block group level was extracted from the census dataset through the use of ESRI Business Analyst. Supermarket chain locations and grocery stores were extracted (*SIC* field = 5411-05) from the 2009 InfoUSA shapefile within the ESRI Business Analyst extension. The businesses excluded mini-markets, discount stores, fish markets, liquor stores, and other small stores that may or may not carry fresh produce. Addresses of current farmers markets were generated compiled from two lists: one from the Bureau of Engineers under the City of Los Angeles Department of Public Works and the second from the California Federation of Certified Farmers' Markets (see http://cafarmersmarkets.com for further information) and then digitized. The community garden shapefile was obtained from the Los Angeles Community Garden Council and the Bureau of Engineers under the City of Los Angeles Department of Public Works. Six of seventy-two community gardens locations were incorrectly geocoded (Downtown Long Beach, Lago Seco, Palmer Park, Pico Rivera, Santa Monica (Main Street), and Santa Monica (Park Drive)). Their addresses were correct but spatially located in a different city. The six community gardens were re-geocoded using the ESRI Online Place Finder Web Service within ArcGIS 9.2, activated by clicking on binocular button. FITNESSGRAM data were obtained from Michael Jerrett of the University of California, Berkeley. The variable "body composition fail – total" represents the percentage of body fat and was used as an obesity or physical fitness indicator for adolescents in the fifth, seventh, and ninth grades in the County of Los Angeles. The dataset was compiled at the zip code level

Data for population density; percent population below poverty; percent population 17 years old and under; and percent population 65 years old and older; and obesity were handled as follows. The lowest and highest values present in the study area for each variable were determined. The lowest value was scaled to 0, and the highest value was scaled to 1, with 0 indicating lowest need and 1 indicating highest need. All intermediate values were transformed to correspond with values between 0 and 1. Table 2 shows the ranges for each of these variables. Each vector data layer was converted into a 100-m resolution raster layer.

Table 2. Value ranges for variables transformed to a continuous 0–1 scale.

Variable	Lowest value (scaled to 0)	Highest value (scaled to 1)
Population density	0	128,900
Percent population below poverty	0	100
Percent population 17 and under	0	79.67
Percent population 65 and over	0	100
Obesity	0	52.15

Median income was dealt with as a categorical variable. Disadvantaged and severely disadvantaged communities earned a median household income at or below $42,420 per year, and therefore, block groups at this income level were assigned a score of 1. Block groups representing low-income communities (i.e. median household income between $42,421 and $53,025) were assigned a score of 0.5. Block groups with median household income over $53,025 were assigned a score of 0. This data layer was also converted into a 100-meter raster layer.

Areas within CDBG were assigned a score of 0–1 according to proximity to grocery stores, farmers' markets, and community gardens. Scores of 1 represent areas that are at least 1-mile away while values approaching towards 0 indicates areas becoming closer to the source location of grocery stores, farmers' markets, and community gardens). This task was performed by converting point locations of community gardens and grocery stores and linear segments representing farmers' markets into 100-meter raster layers. The Euclidean Distance function in ArcGIS 9.2 was used to identify the distance from each cell (or area) within the CDBG area to the closest community gardens, farmers' markets or grocery stores. The resulting raster file was divided by 1-mile to convert the landscape into values ranging from 0–1. Cells over a value of 1 were reclassified as 1.

After data for all nine variables were transformed to a scale of 0–1, these raster layers were added together to produce a composite score.

Potential Site Considerations

We developed a map that suggests areas in the CDBG zones where it may be detrimental to human health — that of gardeners and/or of garden produce consumers — to locate a community garden. This map includes four categories of land use suggested by the gray literature and city planning documents on community gardens to be locations to avoid, as well as uses suggested and agreed upon by the project team. These categories include: major transportation infrastructure (freeways, rail lines); gasoline service stations; Superfund sites; and Toxic Release Inventory (TRI) registered sites.

Data on freeways were obtained from ESRI Data and Maps CD (source: Tele Atlas North America/Geographic Data Technology), and rail lines from the Los Angeles County Metropolitan Transportation Authority (see http://developer.metro.net/gisdata/gisdataoverview). Gasoline service station locations were extracted from ESRI Business Analyst (*SIC* field = 5541-01). Superfund site data were obtained from Environmental Protection Agency (see http://www.epa.gov/enviro/html/frs_demo/geospatial_data/geo_data_state_combined.html). TRI locations were obtained from the Environmental Protection Agency (see http://www.epa.gov/tri/tridata/current_data/index.html#hState). Through consultation with Stephanie Shakofsky of Center for Creative Land Recycling, a subset of TRI sites were selected to include in the analysis based on the potential of emitted chemicals to pollute surrounding soils. Sites containing heavy metals and hydrocarbon complex (BTEX) comprised this subset. Freeways and rail lines were buffered by 1,000 feet, as a first pass indicator of the distance within which particulate air pollution would cause adverse health effects.

Landscape of Opportunity

The final map displays specific locations where it may be possible or fruitful to place a community garden. Location types were compiled from the gray and academic literatures and city planning documents on community garden location strategy, and also from discussions amongst the project team. The following land use types were selected for inclusion in this map: schools, parks, places of worship, and publicly owned vacant parcels and surplus properties for sale. WIC centers were also mapped to indicate the presence of potential community partners.

Data for schools, libraries, and churches were obtained from ESRI Data and Maps CD (source: United States Geological Survey). Parks data was obtained from Green Visions Plan for the 21st Century Southern California (see http://greenvisionsplan.net. WIC center locations were obtained from Community Redevelopment Agency of Los Angeles (CRA/LA). Data for vacant land came from two different sources: Los Angeles County Assessor's Office and the City of Los Angeles surplus land list from the City's General Services Department. Only parcels larger than 5,000 square feet were mapped; this measurement, approximately the size of a lot for a single family home, was determined by the project team to be the minimum amount of land needed for a community garden. Vacant surplus land data were current in October 2010 and were included as an example of how these opportunities could be mapped. Surplus property information must be updated and verified by City agencies and officials. For all maps, we masked out uninhabited areas, such as the Port of Los Angeles and Hansen Dam Recreation Area, as well as the portion of the CDBG block on the UCLA campus, since this area would not be CDBG eligible because of the affluent demographics in the surrounding area.

Web tools

The graphical assessments of need will be made available as kmz files that can be viewed in the free Google Earth viewer for the entire study area.

Results

The first map produced is a "landscape of need" (Figure 1) where areas with low composite values (near 1.31) demonstrate least need, and areas with high composite values (near 5.52) demonstrate the highest need for community garden relief.

Figure 2 illustrates the "landscape of siting considerations" that suggests areas in which planners and garden advocates may want to avoid placing gardens.

Potential opportunities for community garden sites are shown in Figure 3.

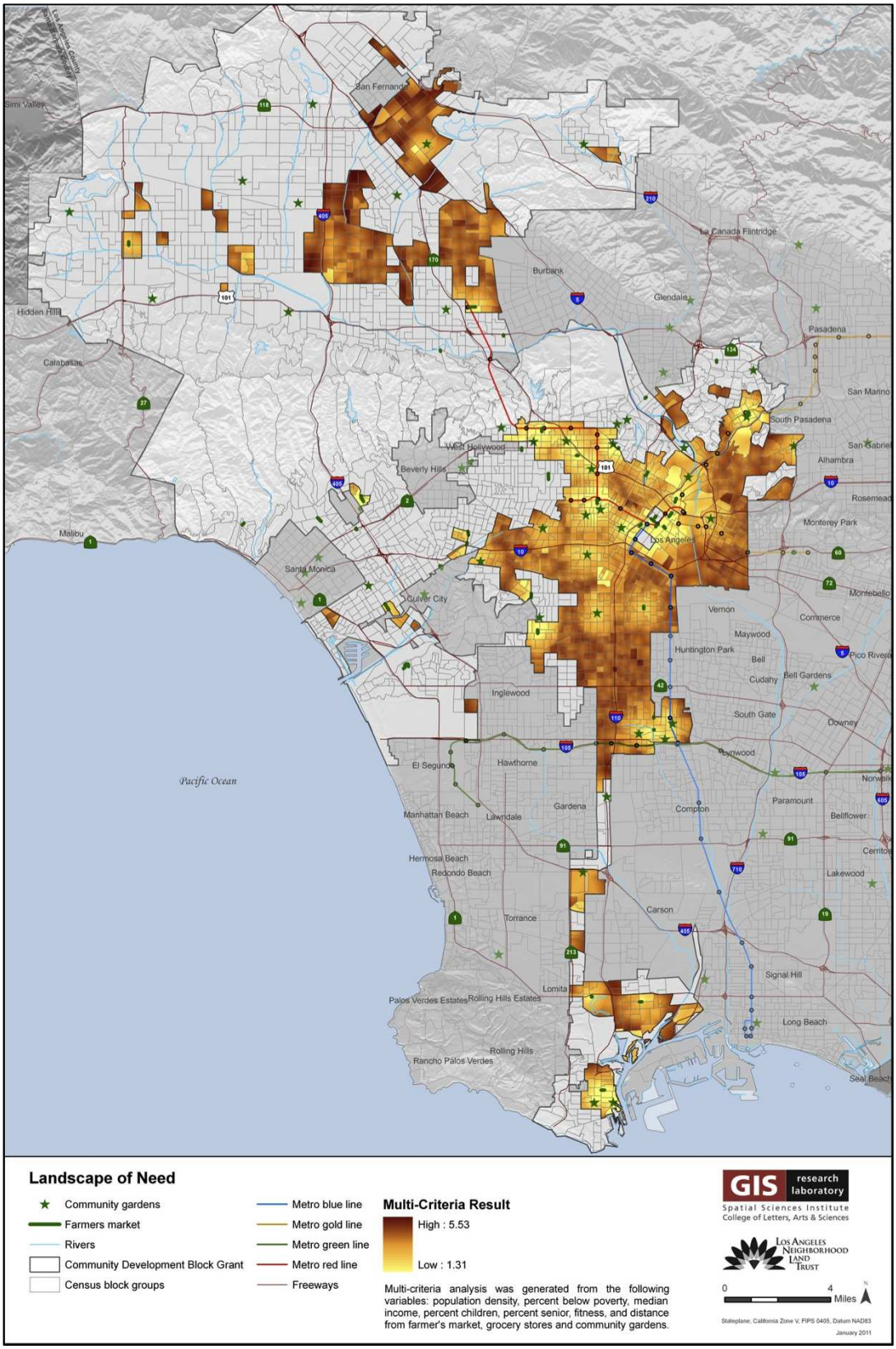

Figure 1. Multifactor evaluation of need for community gardens and fresh food.

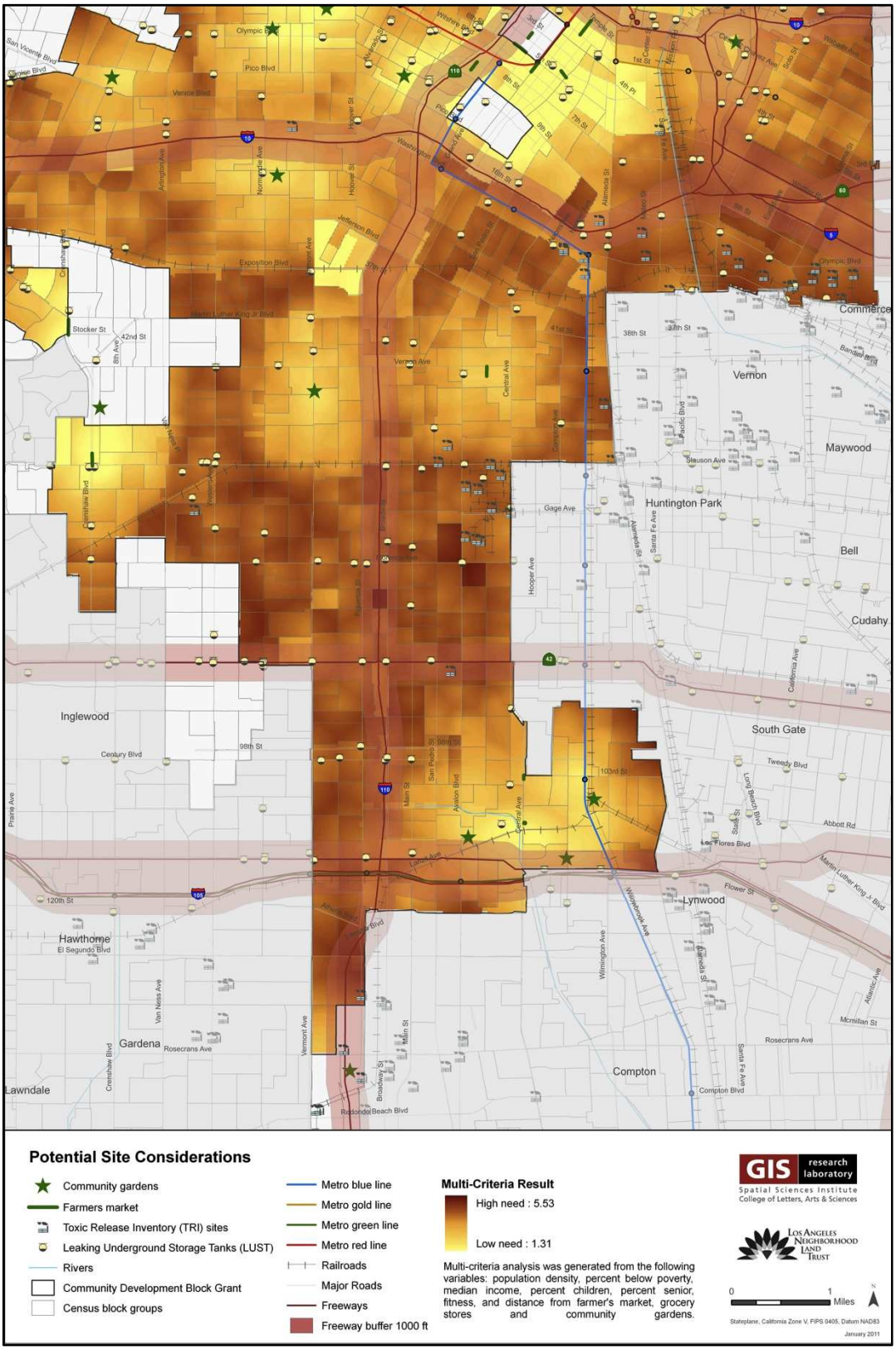

Figure 2. Site considerations for placement of community gardens. Features of interest overlaid on landscape of need.

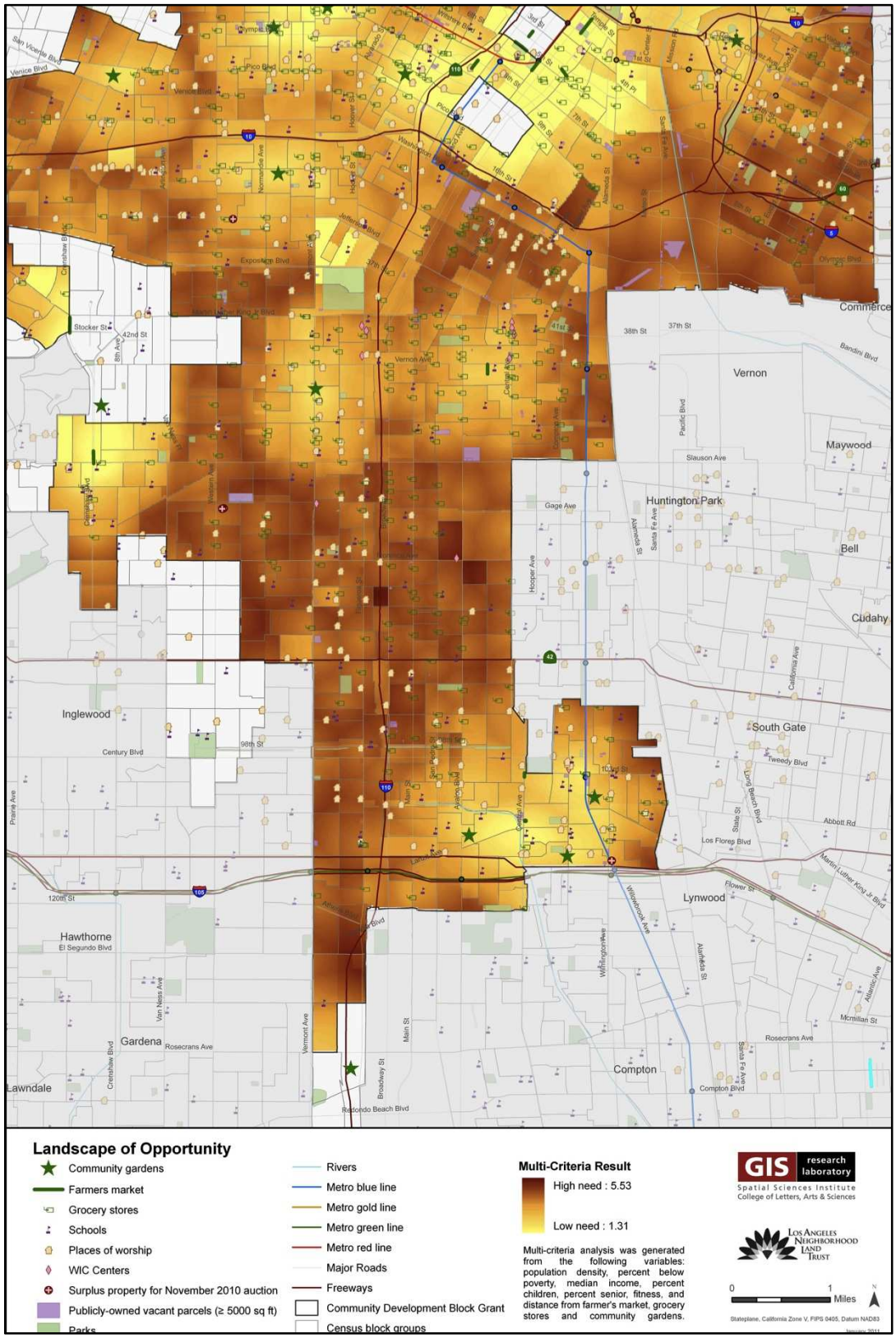

Figure 3. Landscape of opportunity for community gardens in South Los Angeles, showing surplus parcels and public facilities with possible co-location possibilities.

Discussion

Many of the low income neighborhoods identified in this report face disparities with regard to neighborhood conditions and resources that support healthy life choices and minimize environmental health risks. Residents have limited access to nutritious, healthy food options but have access to an excessive number of fast-food chains, liquor stores, and small convenience stores selling processed, high calorie foods. Food desert conditions and the high rates of obesity found among residents in low income neighborhoods are linked to the lack of nutritious food resources and lack of park space and community gardens in the area.

The maps provide an important overview of the health disparities and food desert conditions that exist in low-income neighborhoods. We hope that by raising awareness of the areas where these disparities exist, that resources will increase to for community gardens to help address the gap in services. Information from these maps is intended to support planning efforts by community based organizations, community members, and public officials interested in developing community gardens located in food deserts with high public health disparities. By using the information provided in these maps, it is the intent of the project team that projects will be developed to provide the greatest impact in addressing the lack of community gardens and access to locally grown fresh foods.

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