A SPATIAL ANALYSIS OF POTENTIAL DISPLACEMENT AND GENTRIFICATION ISSUES IN RIVERFRONT COMMUNITIES ALONG THE LOS ANGELES RIVER

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Introduction

In 2014, Los Angeles Mayor Eric Garcetti announced the one billion dollar L.A. River revitalization plan for restoring 11-miles of the river from Griffith Park to downtown Los Angeles (Figure 1). The ultimate goal of the plan is to revitalize the river by creating and expanding recreational facilities to make the river more accessible. Private developers and investors have become interested in the properties located along the plan extent. As the plan moves forward, housing values and rents have increased by approximately 20%. Existing residents who have in some cases lived in the area for decades, are concerned about the associated housing market changes. As rents increase, low-income working families may not be able to afford their living expenses. Eventually those residents cannot help but move to different areas where affordable housing is available. This analysis was conducted to provide riverfront communities with geographically visualized deliverables of the potential impacts of the plan, and to provide perspective related to the potential gentrification in the area as a result of the river revitalization project.

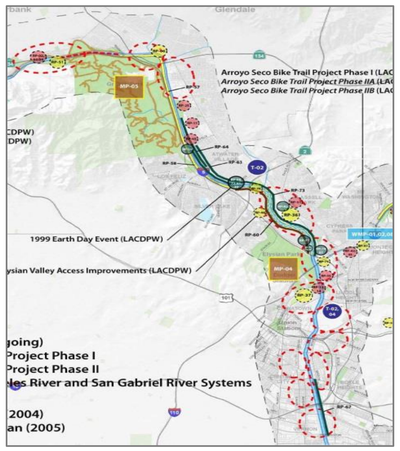

Figure 1. The extent of $1-billion plan (11-mile of the river). Image from the City of Los Angeles.

Data and Data Sources

Census datasets (housing tenure, race, median household income, educational attainment, and home value) were used to conduct gentrification analysis and were obtained from the U.S Census Bureau (American Factfinder). The 2014 county-wide median household income threshold was obtained from the U.S. Department of Housing and Urban Development. The threshold was used to find vulnerable households based on income value. Census tract shapefiles obtained from the TIGER Line webpage were used for incorporating the non-spatial census datasets and visualizing them in maps. A 2014 aerial imagery of Los Angeles County obtained from the USDA was incorporated in the map book to provide better visual inspection of local areas for map users. Furthermore, administrative boundary datasets obtained from the Los Angeles County GIS Data Portal were used for delineating the effective boundary of study area (Table 1).

Table 1. List of data and data sources used in the project

Dataset	Source
Tenure 2010, 2014	The U.S. Census Bureau (American Fact Finder), American Community Survey (ACS)
Race 2010, 2014	The U.S. Census Bureau (American Fact Finder), American Community Survey (ACS)
Median Household Income 2010, 2014	The U.S. Census Bureau (American Fact Finder), American Community Survey (ACS)
Educational Attainment 2010, 2014	The U.S. Census Bureau (American Fact Finder), American Community Survey (ACS)
Home Value 2010, 2014	The U.S. Census Bureau (American Fact Finder), American Community Survey (ACS)
Median Household Income of Los Angeles County 2014	The U.S. Department of Housing and Urban Development (HUD)
Census Tracts Shapefile 2010, 2014	The U.S. Census Bureau (TIGER)
Los Angeles County Aerial Imagery 2014	The U.S. Department of Agriculture (USDA)
Los Angeles County Parcel 2014	The Los Angeles County GIS Data Portal
City Boundaries of Los Angeles County	The Los Angeles County GIS Data Portal
Roads	The Los Angeles County GIS Data Portal
Community Boundary	The Los Angeles County GIS Data Portal
Los Angeles River	The Los Angeles County GIS Data Portal

Methodology

After the raw datasets were collected and modified, they were reviewed for additional modifications. The 2010 and 2014 census datasets were combined with the 2014 census tract shapefile of Los Angeles City. Displacement vulnerability, demographic characteristic change, and housing market condition change were separately analysed to determine what types of gentrification pressures might have impacted individual census tracts during the study period.

In the displacement vulnerability analysis, displacement risk factors (2014 tenure, 2014 race, 2014 median household income, 2014 educational attainment) of individual census tracts were compared to the city-wide average values, and if a tract satisfied more than three factors, that tract was categorized as being vulnerable to resident displacement.

In the demographic characteristic change analysis, value changes in the risk factors from 2010 to 2014 of individual census tracts were compared to those of the city-wide average rate changes. If a census tract experienced greater than average change in three of the four factors used in the vulnerability displacement analysis **or** experienced greater than average increases in both the percentage of the population self identifying as white **and** percentage of the population holding a bachelor`s degree, the tract was categorized as experiencing demographic changes related to gentrification.

In the housing market condition change analysis, 2014 home value ratios were calculated based on the median home value of individual census tracts and the city-wide average home value. Home value appreciation rates were generated based on home value changes between 2010 and 2014. With the results of the 2014 home value ratios and 2010-2014 home value appreciation rates, the census tracts were categorized as ***unaffected, adjacent, or accelerating***.

By combining the results of the three analyses described above it was possible to determine the extent to which each census tracts in the study area experienced gentrification during the study period and classify them according to the following gentrification levels: ***Susceptible, Early: Type 1, Early: Type 2, Dynamic, and Unaffected***. After the categorization of gentrification, one-mile buffer analysis were performed with the Los Angeles River dataset to extract the analysis results of the riverfront communities. Ultimately, three different cartographic products were developed (static maps, a map book, and an interactive 2D web map) for delivering the results to map users.

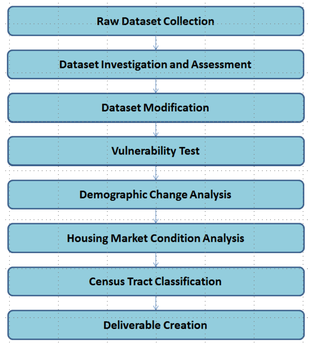

Figure 2. Flow chart of project tasks conducted in this study

Timeline

Table 2. Project timeline

Project tasks	Task periods
Project planning	February 7th, 2016 – February 23rd, 2016
Project literature review	March 7th, 2016 – March 29th, 2016
Data collection	April 18th, 2016 – April 29th, 2016
Data process and review	May 9th, 2016 – May 27th, 2016
Data analyses and results	May 30th, 2016 – June 17th, 2016
Deliverable creation	July 1st, 2016 – July 22nd, 2016
Thesis draft	June 20th, 2016 – August 2nd, 2016
Thesis submission	August 12th , 2016

Results

Of the 164 census tracts located within the one-mile buffer zone around the LA River revitalization area, 98 tracts found to be *Unaffected* were either having no valid dataset or having no vulnerable values associated with gentrification. 66 were found to be experiencing some level of gentrification. Of those 66 census tracts, 42 were categorized as *Susceptible*, 12 were categorized as *Early: Type1*, and 5 were categorized as *Early: Type2*. Based on the result shown in Figure 3, those 59 census tracts identified as *Susceptible, Early:Type1, or Early:Type2* are predicted to have experienced the beginning phases of gentrification effects such as increases in housing prices and in-migration of high income and college-educated individuals. 7 census tracts categorized as *Dynamic* are assumed to be experiencing ongoing gentrification pressures such as new commercial and residential district constructions. As shown in Figure 5, most of the dynamic census tracts are located in the extent of the current revitalization plan. The riverfront communities containing census tracts that were found to have experienced gentrification-related changes are shown in Table 3.

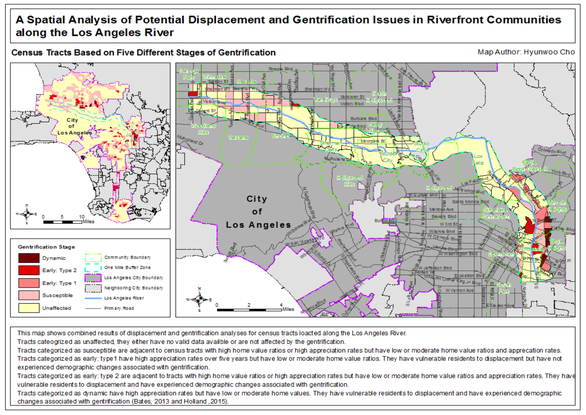

Figure 3. Five gentrification stages of the riverfront census tracts

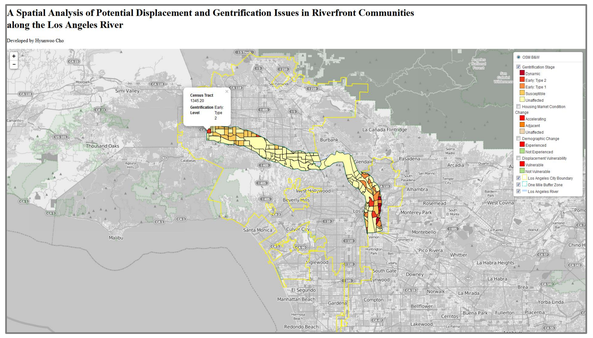

Figure 4. Overview of interactive 2D web map containing the results of analyses

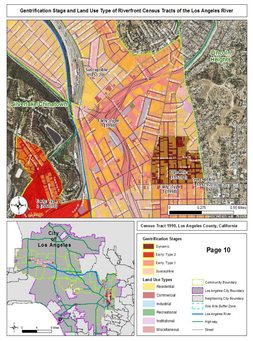

Figure 5. Overview of map book page

Census Tracts	Riverfront Communities
37 census tracts that belong to the 11-mile revitalization plan and were detected as having gentrification changes	Boyle Heights, Downtown, Eagle Rock, Silverlake, South Park, Lincoln Heights, Los Feliz, Wholesale
29 census tracts that fall under outside of the 11-mile boundary but were detected as having beginning phases of gentrification changes	Canoga Park, Encino, Reseda, Tarzana, Van Nuys, Winnetka, Woodland Hills

Table 3. Riverfront communities verified to be under the effects of gentrification

In investigating the results of the gentrification analysis, 37 census tracts of the 66 tracts were verified as being located within the 11-mile boundary of the current plan. Once the plan is implemented, those 37 tracts would be highly vulnerable to gentrification compared to the ones outside of the plan extent. Furthermore, 29 census tracts located outside of the extent were also verified as vulnerable to gentrification. When the plan is expanded to cover the entire river, these 29 tracts are also likely to be vulnerable to gentrification.

After classifying the level of gentrification in each census tract, three different deliverables were created including static maps, a map book, and an interactive 2D web map. The static map (Figure 3) shows the gentrification levels of the riverfront census tracts and their related communities. Accessing the results for each census tract on the web became possible using the interactive web map (Figure 4) which can be further developed into a complete website. With the map book shown in Figure 5, map users are able to inspect locational information of individual tracts and associated local communities that are considered to be vulnerable to gentrification so that they can pull up additional information. The aerial imagery added to the map book helps map users who may not be familiar with the geography of the study area's neighbourhoods to understand their location by landmarks such as lakes, stadiums, schools, and parks.

Discussion

As planned in the beginning of the study, the riverfront census tracts were verified and categorized with different stages of gentrification (Figure 3). Within the 11-mile boundary of the current revitalization plan, six census tracts were found to be in the ***dynamic*** stage of gentrification. These tracts are considered to be currently experiencing ongoing gentrification pressures such as increasing housing prices as well as new developments. After the local community boundary dataset was added to the static map and the map book, it was clear that the Lincoln Heights, Boyle Heights, and Downtown neighbourhoods were experiencing gentrification. Those communities are identified to have ***dynamic*** tracts that are assumed to face higher pressures of gentrification as the current revitalization plan progresses.

With these results and deliverables, map users including community residents, developers, and policy makers can be made aware of areas that are potentially vulnerable to gentrification and come up with plans to mitigate detrimental effects. These results allow them to communicate more effectively so as to have proper resolutions in cases of potential social conflicts over local development and affordable housing supply.

However, the results of this study may not be entirely accurate or up-to-date since the plan has not yet been implemented and the newest datasets available are for the year of 2014. Due to that, the census tracts included in this study have likely undergone additional changes that could be studied with more recent data. Furthermore, there may be additional factors that could be influencing gentrification in the study area. If these factors are incorporated into this study, the effectiveness would be improved.

Conclusion

With the results, local residents of the vulnerable communities and the other stakeholders can have productive communication so as to generate effective resolutions for possible social conflicts that may occur as the revitalization plan is implemented and progresses. This study, however, can be improved if new datasets reflecting more current changes become available. Moreover, if a housing sales dataset containing house sale prices and demographic information of the sellers and buyers can be obtained, current housing market changes that might be related with gentrification can be studied to increase the accuracy of this study.

Furthermore, by using a GPS receiver for field data collection, location information about ongoing construction sites of new residential and commercial facilities in the vulnerable tracts can be collected. With this dataset, the current local changes that might be associated with gentrification can be incorporated into the study for better results.

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Reference:

Bates (2013), Lisa K. 2013. Gentrification and Displacement Study: implementing an equitable inclusive development strategy in the context of gentrification. Portland State University.

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