

Youngseok Kim

Professor Barry Waite and Bonnie Shrewsbury

GIS for Public Policy, Planning and Development

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## **Analysis for Improvement of the Public library's Program**

### **Introduction**

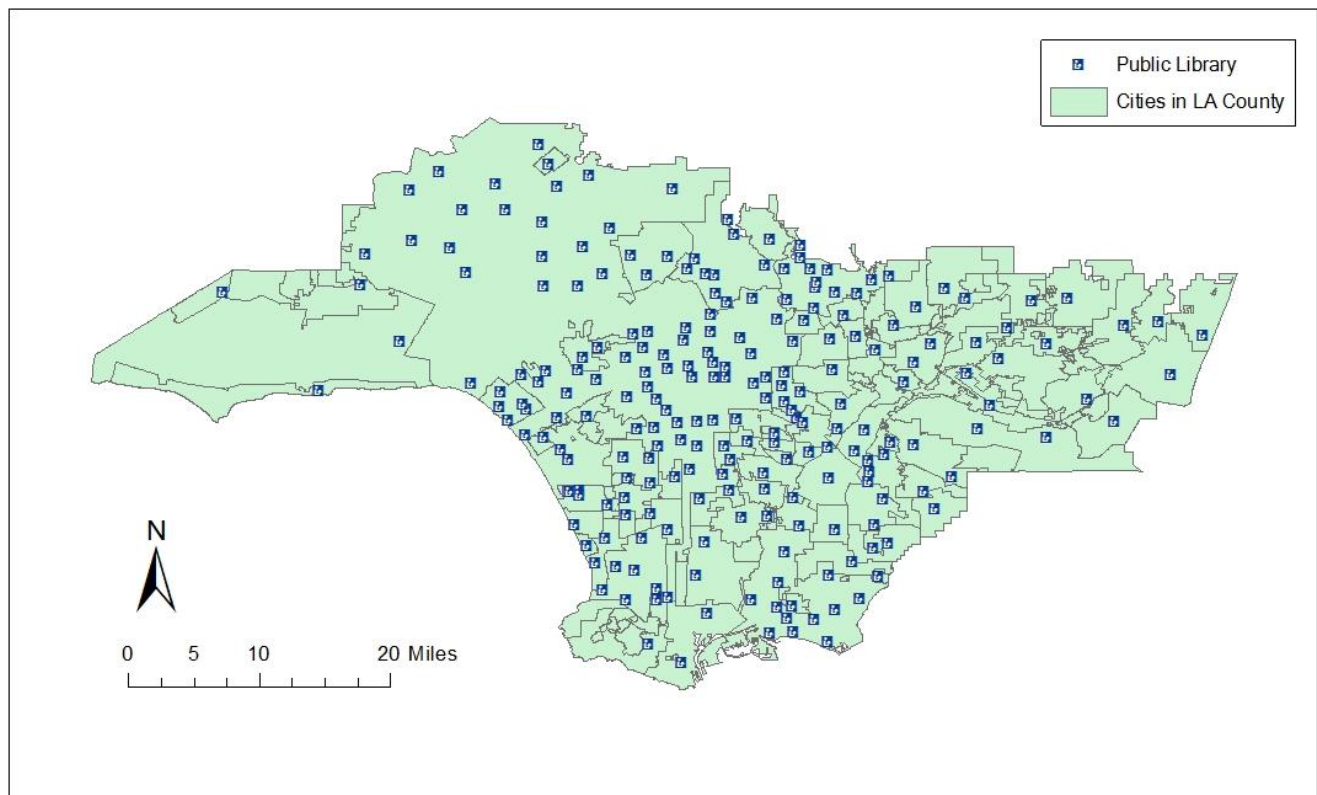
Public libraries have played a crucial role in the community. They serve an important purpose in neighborhoods by offering a public space for individuals to meet formally and informally (Japzon and Gong, 2005). For example, many children spend their time at public libraries in participating various programs for them, such as story time, craft activity, and book discussion. Also, some public libraries offer programs for adult, such as meeting with writers, computer lab, and law consulting. However, the role of public libraries started to decrease from a few years ago because of the development of the smartphone and tablet PC. According to statistics of the California State Library, the average circulation per capita has decreased from 8.45 in 2009-10 fiscal year to 7.93 in 2013-14 fiscal year, and the average visits per capita also has decreased from 6.37 in 2009-10 fiscal year to 5.97 in 2013-14 fiscal year. Therefore, it is necessary to improve programs of public libraries to recover their role in the community because public libraries still have the significance in our society. For revitalizing public libraries, they should offer better programs, and it is helpful for them to know who live nearby them, and to compare their current situation with others at a glance. The Geographic Information Systems (GIS) is a useful tool for this because it can show well their neighborhood and situation visually.

In this study, I would like to show how to improve programs of public libraries in LA County by using GIS analysis. First, public libraries have to reflect the characteristics of their neighborhood, so we

can see who live nearby public libraries from GIS-created maps. To be specific, I analyzed neighborhood based on age and race, because those are the most representative factors among demographics. As a result, it is easier for public libraries to offer their programs differently according to age and race. Second, it is better for public libraries to compare their performance with others' one, and we can do this easily by using GIS. For this analysis, I chose several cities that are located closely but are appeared to have a different race distribution. Selecting these cities enables us to compare race proportion at a glance. Finally, we will check that public libraries can cover all areas with easy access by using buffer analysis. For showing these three analysis result visually, this study was based on public libraries that are in southern part of LA County. Figure 1 shows public libraries that are included in this study.

Figure 1

## Public Libraries in LA County



## Data Sources

In order to show visually how to improve programs in public libraries in LA County by using GIS, I found and received seven sets of data.

- **Addresses of public libraries in LA County** were received from [www.californialibrarystatistics.com](http://www.californialibrarystatistics.com) as an Excel format. This data included all public libraries in the California State, so I left public libraries in LA County.
- **Statistics of California library in 2013-14 fiscal year** were received from [www.californialibrarystatistics.com](http://www.californialibrarystatistics.com) as an Excel format. In order to explain some features of public library use, I left a few data cells with name, address, programs for under age five and visits per capita. However, this data have a limitation because statistics are arranged based on central library including statistics of its branches. Therefore, I could not use statistics on the basis of every LA County public library and every branch of city public library. For example, there are 84 LA County libraries, but the statistic of LA County public libraries is shown as just one number that is the sum of all LA County public libraries. Also, LA city public library has 72 branches, but one statistic of the sum of central library and all branches was analyzed in this study.
- **2010 Census tracts data** was received from fact <http://factfinder.census.gov/> as an Excel. In order to know characteristics of neighborhood, I chose data with age and race.
- I also need three shapefiles to create maps. **LA cities shapefile** was received from [www.barrywaite.org/gis.htm](http://www.barrywaite.org/gis.htm), and **2010 TIGER/Line shapefiles of census tracts and places** were received from [www.census.gov/cgi-bin/geo/shapefiles2010/main](http://www.census.gov/cgi-bin/geo/shapefiles2010/main).
- **LA County Countywide Address Management System (CAMS) Address Locator** was received from [egis3.lacounty.gov/dataportal/](http://egis3.lacounty.gov/dataportal/) to geocode the location of public libraries in LA County.

## Creation of GIS Maps

I created five maps by using data that I received.

- **Figure 1 (Public Libraries in LA County)** was created by geocoding addresses of public libraries based on LA County CAMS address locator.
- **Figure 2 (Programs for under age 5)** was created by displaying programs of public libraries for under age five and population under age five. In order to this process, join statistics of public libraries to geocoding result of public libraries, and join census data about age to census tracts shapefile. However, as I mentioned above, statistics about public library use are arranged based on central library, so I could not include LA County libraries and branches while making this map.
- **Figure 3 (Proportion of Asian Population)** was created by symbolizing bar chart after joining census data about race to census places shapefile. Before joining, I left nine cities that are located nearby from census place shapefile to show visually well.
- **Figure 4 (Average Annual Increasing Rate of Visitors)** was created by similar process with figure 2. After joining data about visit per capita of every public library to geocoding result of public libraries and joining census data about total population to census tracts shapefile, I symbolized those by using graduated symbols and graduated colors. Also, this map did not include LA County libraries and branches as the same reason with figure 2.
- **Figure 5 (Coverage of Public Library)** was created by showing a result of the buffer analysis based on location of public libraries. Also, this buffering result was displayed with symbolized colors of total population.

## Conclusion

First, public libraries have to know and consider characteristics of their neighborhood. Every library has a different neighborhood, so public library can operate specialized programs based on analysis of neighborhood features, such as age and race.

Figure 2 shows that how many children under age five live nearby public libraries and how many programs for under age five are offered at every public library. Therefore, we can know that it is better to expand children programs for some public libraries, such as Pomona, Monrovia, and Calabasas city that have a few programs despite of large population under age five.

Figure 2

## Programs for under age 5

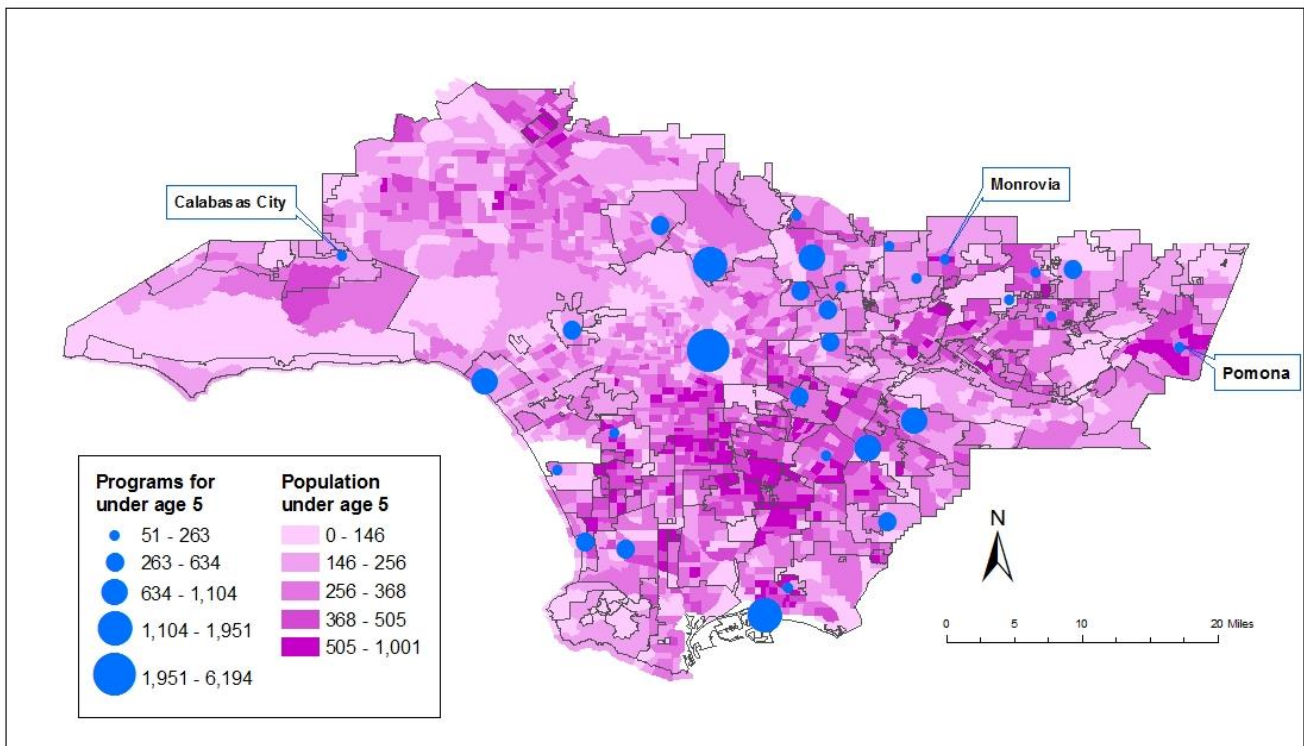
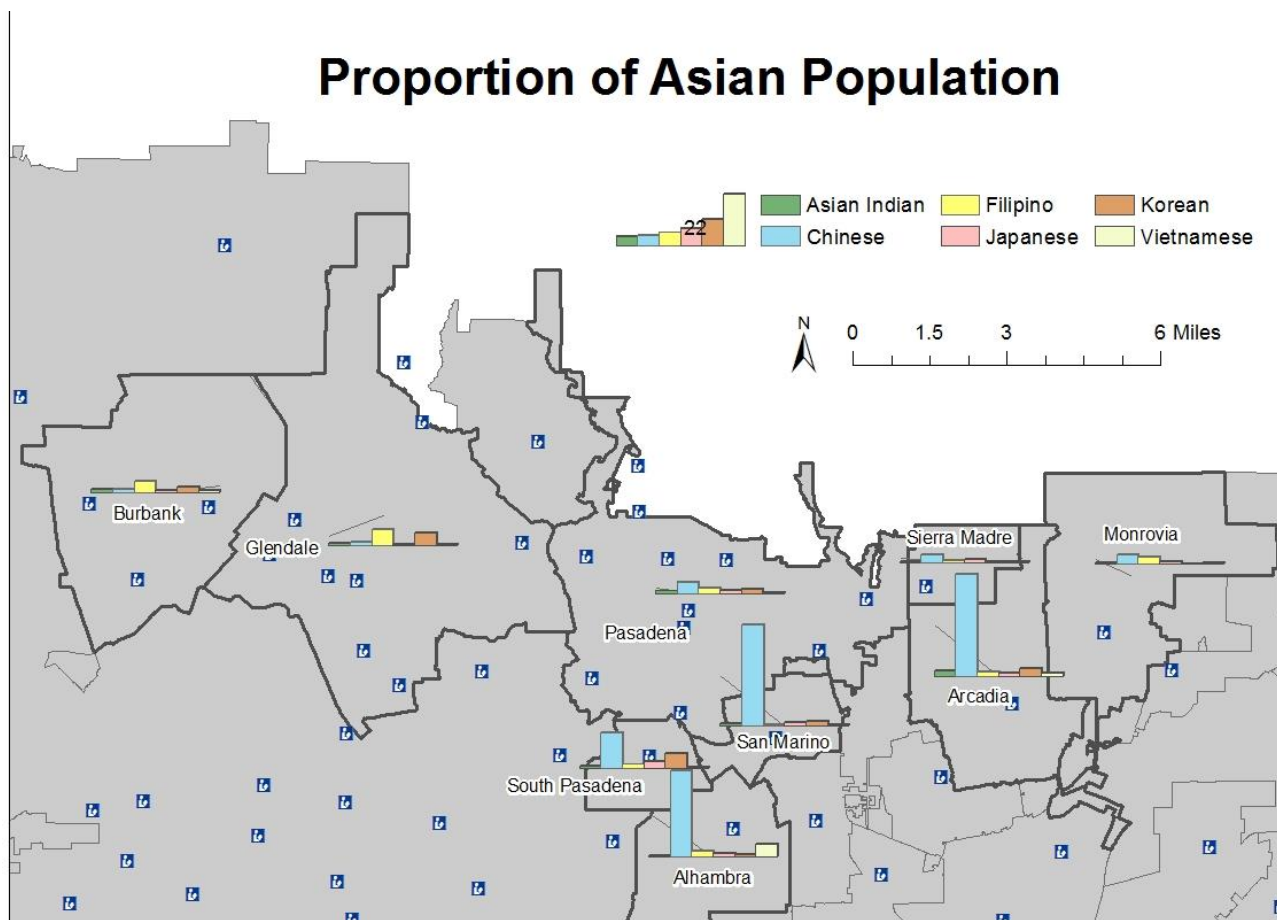


Figure 3 shows that which race lives at every city that has its own public library. I select the Asian race because they usually use not only English but also their mother tongue. Also, they have their own culture and national holidays that are different from western culture. Although the Hispanic population has a similar condition, almost organizations including public libraries already offer separate services for Hispanic. Therefore, I focused the proportion of the Asian population in each city. If public library offers programs that reflect Asian language and culture, more Asian residents visit there to enjoy those programs. For example, public library of San Marino, Arcadia and Alhambra can encourage their neighborhood to visit library by introducing programs for Chinese. Also, public library of Burbank and Glendale can consider expanding programs for Filipino and Korean.

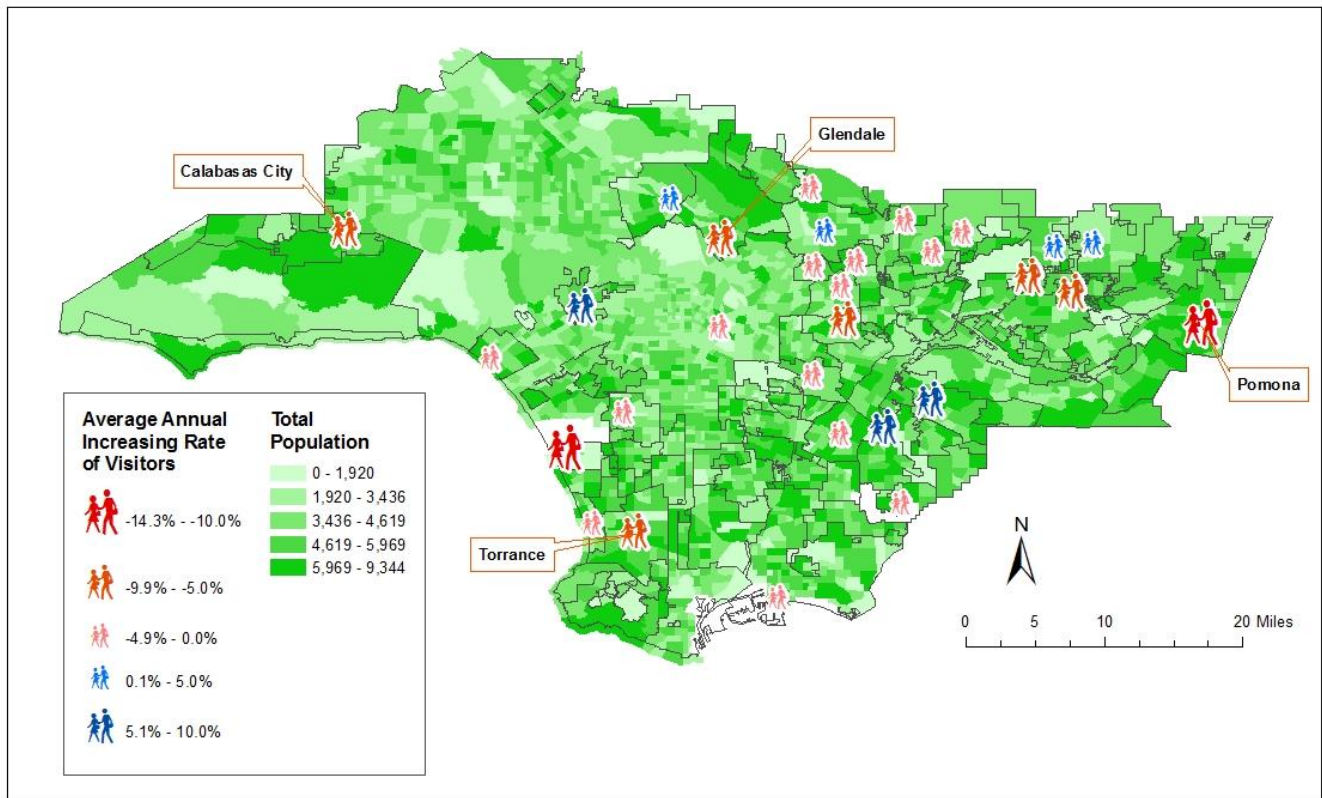
Figure 3



Second, public libraries can revitalize their role in the community by comparing with nearby public libraries. Also, public officials can know and check which regions need a change for better performance. We can know from Figure 4 which public libraries show increase in visitors and which libraries show decrease in visitors. Also, by considering total population at the same time, we can find the region that shows decrease their role despite of large population. For example, public library of Pomona, Torrance, Glendale and Calabasas city should make more effort to recover their role.

Figure 4

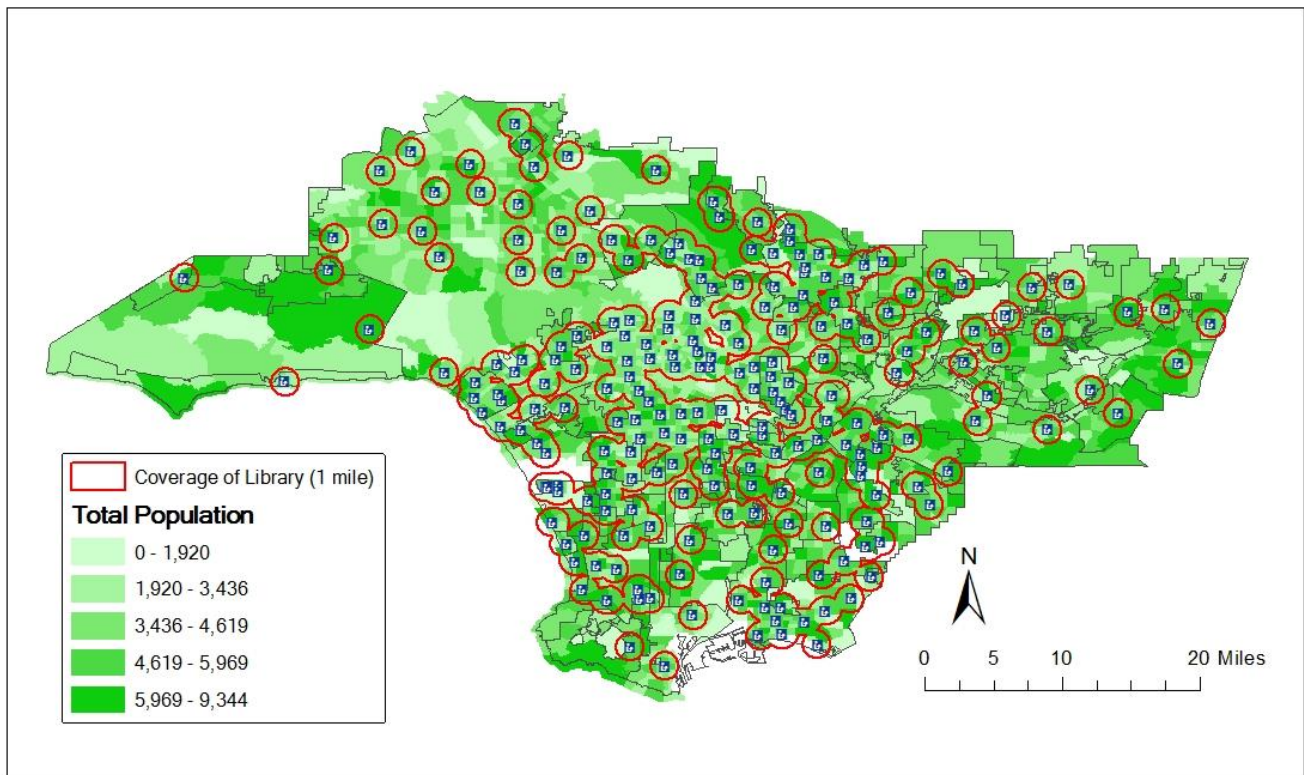
### Average Annual Increasing Rate of Visitors



Finally, we have to check all people are offered public library service within their residence. In order to know coverage of public library service, I use buffering analysis with one miles distance from every library. The reason to set one miles is that it almost takes within fifteen minutes to go to library by walk. I did not consider to use a car because using public libraries by a car is convenient enough now as we can see figure 1. We can check the result from figure 5 and know that some regions need additional public library. Or, these cities can cover their service by using branches, stations and bookmobiles.

Figure 5

### Coverage of Public Library





**Limitation**

As I mentioned above, the limitation of statistics about public library use, I have not analyzed based on every LA County public library and every branch of city public library while creating figure 2 and figure 4. Therefore, it is better to arrange the statistics of public library use based on every LA County public library and every branch in order to know more specifically about how to improve programs of public library.

## References

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