

Introduction

Every city has notoriously “unsafe” neighborhoods. While the perceptions of safety in the media do not always match up to the reality, a neighborhood’s reputation as an unsafe place has a profound effect on the residents’ daily lives. If people avoid neighborhoods that are deemed “unsafe” businesses are not patronized, community institutions do not thrive and social barriers between neighborhoods begin to form. High rates of neighborhood based violence and perceptions of living in an unsafe neighborhood have been found to increase rates of depression in residents in the neighborhood (Wilson-Genderson and Pruchno, 2013). Furthermore, deteriorating social fabric and lack of community engagement through public services may also contribute to greater vulnerability. Given the important effect a neighborhood’s reputation for safety has on the neighborhood and the people who live there, we began to wonder what makes a neighborhood have such high rates of violent crime? While demographic information, including race and poverty are often explored; we thought there might be an opportunity to add additional information to the discussion. As we began to research highly violent neighborhoods around the country we came across a Los Angeles Times article on Westmont, Los Angeles (L.A.), home of the most deadly corridor in the city. Since 2007, over 60 people have been killed along a single two-mile stretch in the neighborhood (Cruz and Schwencke, 2014). While the article offers some possible reasons why so many murders have happened in the neighborhood, what was most salient about this article was a quote from a local leader of a neighborhood non-profit, Nathan Arias, who said, “The community, which has no city government of its own, has fallen through the cracks.” (Cruz and Schwencke, 2014). Arias went on to say, “It’s amazing that an area with such high need is so underserved.” (Cruz and Schwencke, 2014). This prompted us to question, how does a neighborhood become a center for sustained high levels of violent crime and are high levels of violent crime present because of a lack of basic services as Nathan Arias suggests?

Through a network analysis of this neighborhood we aim to gain a better understanding of whether or not Westmont lacks access to basic services and if so, could this be a possible contribution to violence in the neighborhood. We will do this through exploring access to schools, safety services, and jobs in a neighborhood that experiences high levels of violent crime, Westmont L.A., and a neighborhood that experiences relatively low levels of violent crime, Lennox L.A. As Table 1 shows, Lennox and Westmont are similar demographically. They are both majority minority neighborhoods, and both have similar median incomes, poverty rates, and population sizes. Furthermore, as Figure 1 shows, both neighborhoods are in unincorporated L.A. in the same regional area. The major difference between the two neighborhoods is the extreme difference in the number of violent crimes that take place there. By holding things like geographic location and basic demographic information constant, we can better explore why these neighborhoods have such difference rates in violent crime.

Access to Jobs

To measure access to jobs in Westmont and Lennox we analyzed the total number and types of businesses accessible by each neighborhood within a thirty minute commute time by car and rail. Thirty minutes is the average commute time in Los Angeles (“Average Commute Times”, 2014). Most residents in Westmont and Lennox use a car to get to work. However, in each neighborhood, the second highest mode of transit used to commute to work was public transit. In Westmont, 14.8% use public transit to commute to work compared to 68.5% of people who drove to work alone in their personal car. In Lennox, the breakdown is similar with 11.1% who use public transit to work while 66.2% used a personal car (Census Bureau ACS 2008-2012 (5-Year Estimates), Table B08101). While public transit includes many different modes, given the time constraints of our project we decided to define public transit in the context of this neighborhood as the Metro Rail. Jobs were defined by a business repository of all businesses in Los Angeles in 2011.

Access to jobs by rail and car was conducted slightly differently. To increase the accuracy of the rail analysis we first measured the number of census blocks that had access to the closest rail stop within a half-mile walk. A half-mile was used because it is the typical length people are willing to walk. Then the distance from all census blocks that were accessible to the stop was measured. The rail schedule was used to determine how far the population of each centroid could get within a thirty-minute limit. While commuters potentially had a significant amount of time to walk to a job that was only one rail stop away, we maintained a half-mile limit on how far someone would walk from the rail stop to his or her job maintaining that initial assumption. A weighted average based on population was calculated for the number of jobs each neighborhood had access to. 23 blocks had access to a rail stop in Lennox compared to 14 in Westmont. This translated to 5,550 residents in Lennox and 1,275 residents in Westmont who had access to a rail stop within a half-mile. The results of the number of jobs each neighborhood had access to is summarized in Table 1. Lennox residents had access to only a slightly higher number of jobs than Westmont. Indicating that while many more Lennox residents have access to their jobs by rail using the half-mile assumption, they do not have access to a significantly higher amount of jobs by rail.

To measure access by car, a 30-minute commute area was calculated for each census block group in Lennox and Westmont and a weighted average based on population was found. The results are displayed in Table 2. Westmont has access to about 14,000 more jobs than Lennox by car.

Access to Safety Services

Police Services

Since Lennox and Westmont are both unincorporated neighborhoods, their primary police services are provided by the L.A. County Sheriff’s Department. This means that residents in these neighborhoods only have access to police services supplied at the county level and do not have access to services through a contracted municipality or the city of L.A. despite how close these departments might be to Lennox and Westmont. In our analysis, we made the assumption that police respond from the nearest Sheriff’s Department. While this may not always be the case, this was the best proxy for where most police would be stationed at one time and would respond from. Therefore, we located the various Sheriff Department headquarters that serve these neighborhoods and used the national average response time, six minutes to create a service area (Palmer, 2014). The number of census block groups and subsequently the number of residents who had access to a standard response time was calculated.

Our findings, shown in Table 3 and Figure 6, show that Lennox and Westmont have very different levels of access to police response. There are two L.A. County Sheriff’s Departments in the vicinity of Lennox and Westmont. One is just south of Westmont on Imperial Highway and

one is just north of Lennox in Inglewood. While the Sheriff's Department in Inglewood is significantly closer to Lennox, it does not cover the centroid of any block group. Therefore, according to our analysis, Lennox has no access to police response within six minutes. The Sheriff's Department closest to Westmont, however, does service the neighborhood within the allotted service time. About half of Westmont's residents and block groups fall within the five-minute service area. Therefore, Westmont has much better access to police than Lennox.

Emergency Medical Services (EMS)

In order to measure access to EMS response times, we found all hospitals with emergency services in the region and ran a service area analysis based on a four-minute standard response time and measured the number of census block groups who had access. Four minutes is the standard response time in life threatening situations for EMS to be able to respond and employ life saving techniques (Ludwig, 2004). As can be seen in Figure 6 and Table 4, running a four-minute service area from each of the emergency facilities reveals that Lennox is partially served by area hospitals but Westmont is not. This analysis reveals that the Westmont neighborhood is completely outside of a four-minute service area from any emergency facilities. Lennox on the other hand is partially serviced in the service area with approximately 6,843 residents who have access.

Fire Response

To analyze access to fire response we located the L.A. County fire stations closest to the two neighborhoods and looked at a service area for a six-minute response time. Six minutes is the national standard for response by fire departments ("How Fast is LAFD...?", 2012). The fire department analysis was the most comparable between the two neighborhoods because of the locations and number of fire stations within close proximity. There is one fire station located near the center of each neighborhood and one additional fire station located in between both neighborhoods. Both neighborhoods are relatively well serviced by the local fire stations. According to our analysis, every resident in Lennox has access to a six-minute response time in by the fire department while 84% of Westmont's population has access to a six-minute response time.

Access to Schools

Access to Schools was measured by first locating all of the nearest schools in the Lennox School District, which Lennox is districted for, and L.A. Unified School District, which Westmont is districted for. We assumed that children would most likely be going to the school they would default to, based on their residence. While L.A. allows students to go to schools within or outside of their school district by applying, to simplify our analysis and better capture a neighborhood's "basic" access to schools we only looked at access to the nearest schools in the neighborhood's district. The weighted average distance based on population between Elementary, Middle, and High schools and the centroid of each block group in Lennox and Westmont was calculated. The results, as shown in Table 6, demonstrate that Lennox has a shorter average weighted distance to Elementary and Middle Schools than Westmont. Westmont on the other hand has an overall shorter average weighted distance to High Schools than Lennox. One reason for this is that Lennox does not have its own High School in the Lennox School District. Therefore, students in Lennox must go to an adjacent school district to attend a public High School.

Conclusions

Table 7 show the results of our full analysis to begin to answer the question, is access to basic services a problem in neighborhoods that experience high levels of violent crime. By comparing Lennox and Westmont, we are able to compare two neighborhoods, relatively similar in demographics but very different in rates of violent crime. Table 7 indicates that based on the multiple services we looked at, neither neighborhood shows a comparative disadvantage in access. However, looking at each service separately, differences in access can be better understood. While Westmont has access to more jobs by car than Lennox, Westmont has less access by rail and significantly fewer residents who can access the rail stop nearest Westmont. Transit dependent populations tend to be more vulnerable and therefore, a lack of access for them is often more significant than those who can use a personal car (“Transit Civil Rights...”, 2011). While this analysis does not demonstrate how this might effect the transit dependent population of Westmont, it does show that it exists, and there is an access problem for them in the neighborhood. Another significant finding in our analysis was the EMS analysis results. This analysis showed that zero residents in Westmont had access to a four-minute response time. Given that “death alley” is located in Westmont, the high rates of violent crime would lead one to believe that fast response times would be meaningful in the neighborhood. The fact that none of the population had access to a response time deemed necessary for life saving situations is concerning. In the end, our analysis does not seem to indicate Westmont, a neighborhood that experiences high rates of violent crime particularly, lacks access to basic services. Other structural issues are obviously at play in neighborhoods that experience violence and there are opportunities to explore this issue further. Either way, we hope that our study can help change the way people think about neighborhoods that have high rates of violent crime and help influence practitioners to explore ways to address spatially concentrated violence.

There were a few limitations to our analysis. One of the biggest limitations was the use of the existing miles per hour (MPH) that was embedded in our roads file. Upon exploring our network dataset, we realized that in a city like L.A., which has notoriously bad traffic, that a network dataset that does not include any mechanism to build in traffic becomes very problematic. We reduced the MPH to better accommodate traffic based on a recommendation by a transit organization in L.A. but we recognize that our analysis still does not reflect daily travel in L.A. Another limitation, which was a methodology choice, was the proximity of our two neighborhoods. While, we wanted to chose neighborhoods that were similarly situated in most ways other than rates of violent crime, the lack of differentiation between the neighborhoods in our results may largely be due to the fact that the neighborhoods were too close to one another and therefore shared many of the same services, especially by car.

In the future, we would like to look at other services including grocery stores, voting stations, and daycares. We would also like to expand our analysis to multiple neighborhoods that are similarly situated but experience different rates of violent crime. Furthermore, we would like to incorporate other modes of transit to better capture how residents deal with accessibility issues.

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APPENDIX

	Lennox	Westmont
Total Population	22, 218	30,483
Land Area (SqMi)	1.06	1.84
Percent White (%)	31.58	18.48
Percent Black (%)	7.3	52.28
Percent Latino (%)	58.23	26.62
Percent Asian (%)	0.49	0.04
Avg Median Household Income (\$)	35,682	31,490
Poverty Rate (%)	34	33
Number of Violent Crimes Over a 6 Month Period	60	268

Table 1: Neighborhood Comparison; U.S. Census Bureau, American Community Survey 2012 5-Year Estimates; “Violent Crime,” *L.A. Times*, <http://maps.latimes.com/neighborhoods/violent-crime/neighborhood/list/>, accessed on October 1, 2014. Poverty rate calculated for percent of the population for which poverty status has been determined that falls into the lowest poverty bracket, under .50.

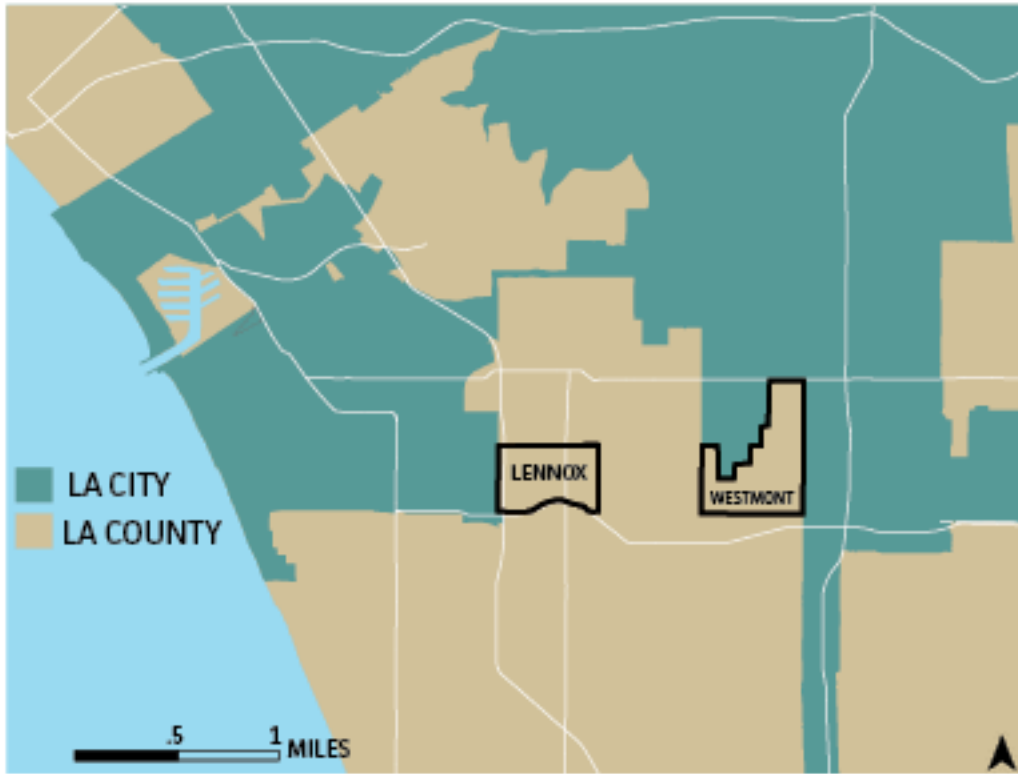


Figure 1: Neighborhood Map

Source: Map Created by Lacey Sigmon. UCLA MapShare LA County Shapefiles, LA County Government GIS Repository.

	Lennox	Westmont
Number of Companies Accessible	1,416	1,396

Table 2: Number of Companies Accessible by Rail Within a 30 Minute Commute

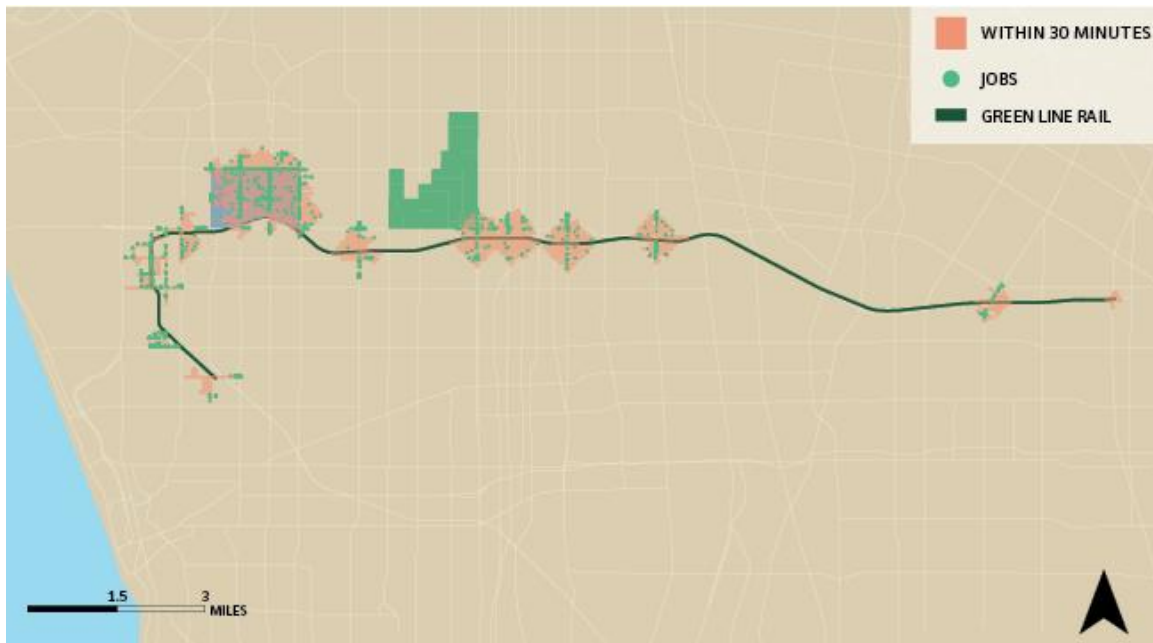


Figure 2: Access to Jobs by Rail in Lennox, LA

Source: Map Created by Lacey Sigmon. UCLA MapShare, LA County Government GIS Repository, LA Metro GIS Data.

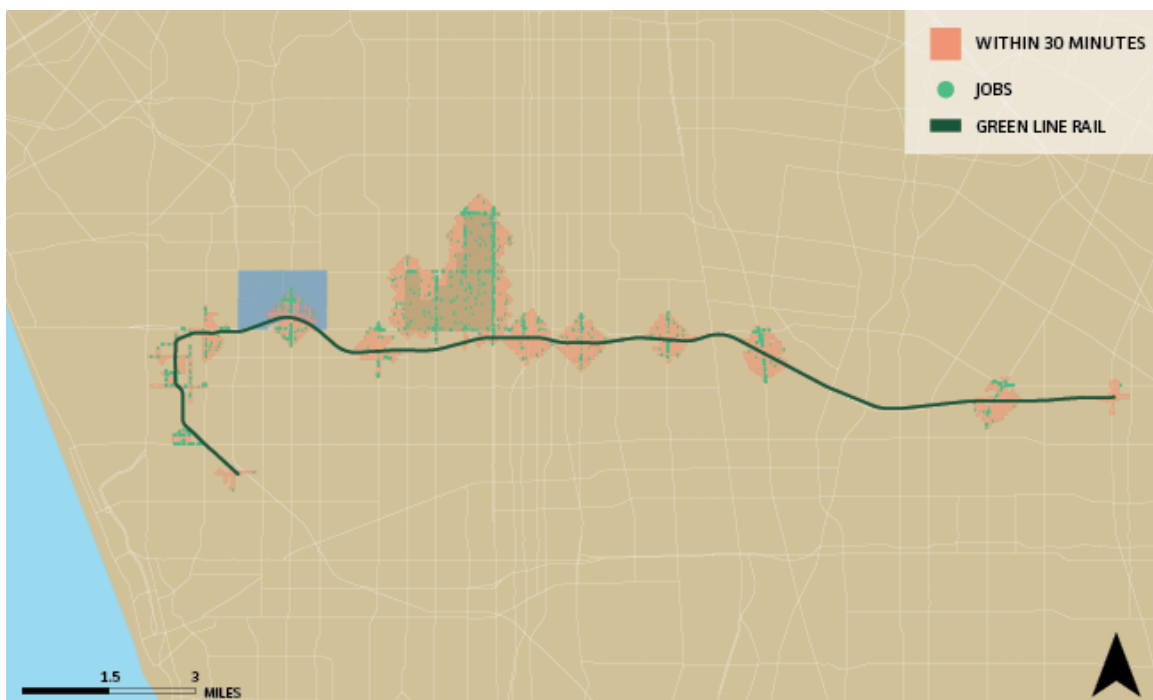


Figure 3: Access to Jobs by Rail in Westmont, LA

Source: Map Created by Lacey Sigmon. UCLA MapShare, LA Metro GIS Data, One Source Global Business Browser.

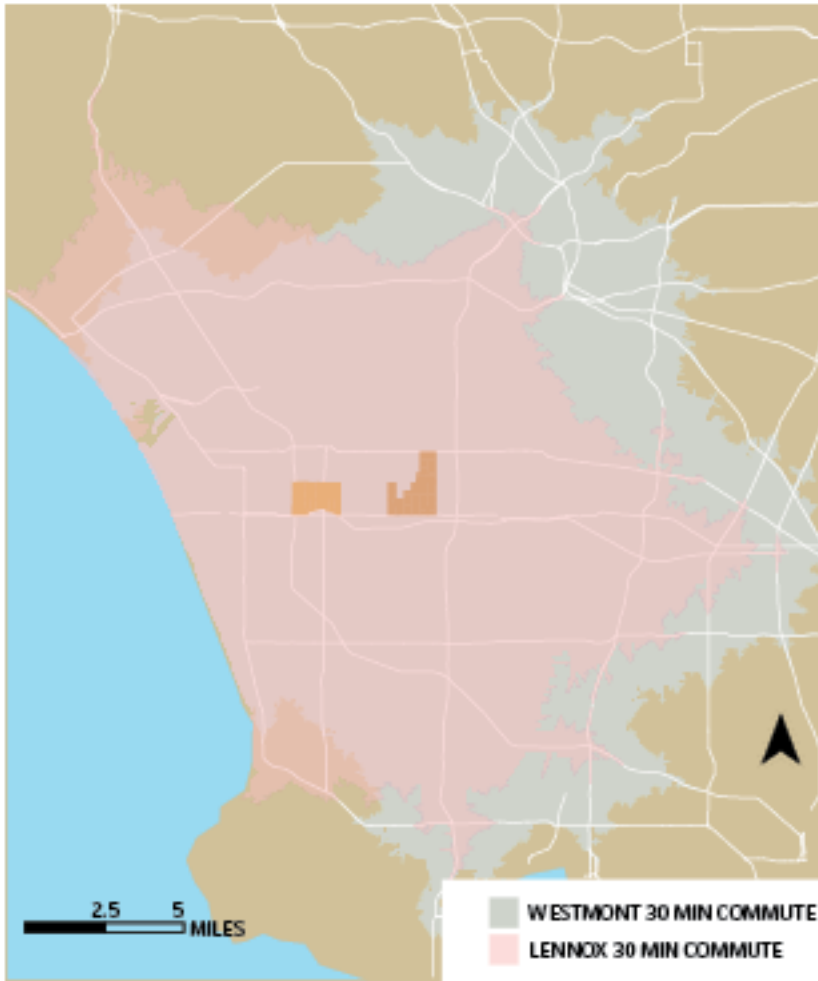


Figure 4: Job Access by Car in Westmont and Lennox
 Source: Map Created by Lacey Sigmon. UCLA MapShare LA County Shapefiles.

	Lennox	Westmont
Number of Companies Accessible	92,582	106,051

Table 3: Number of Campnies Accessible by Car Within a 30 Minute Commute

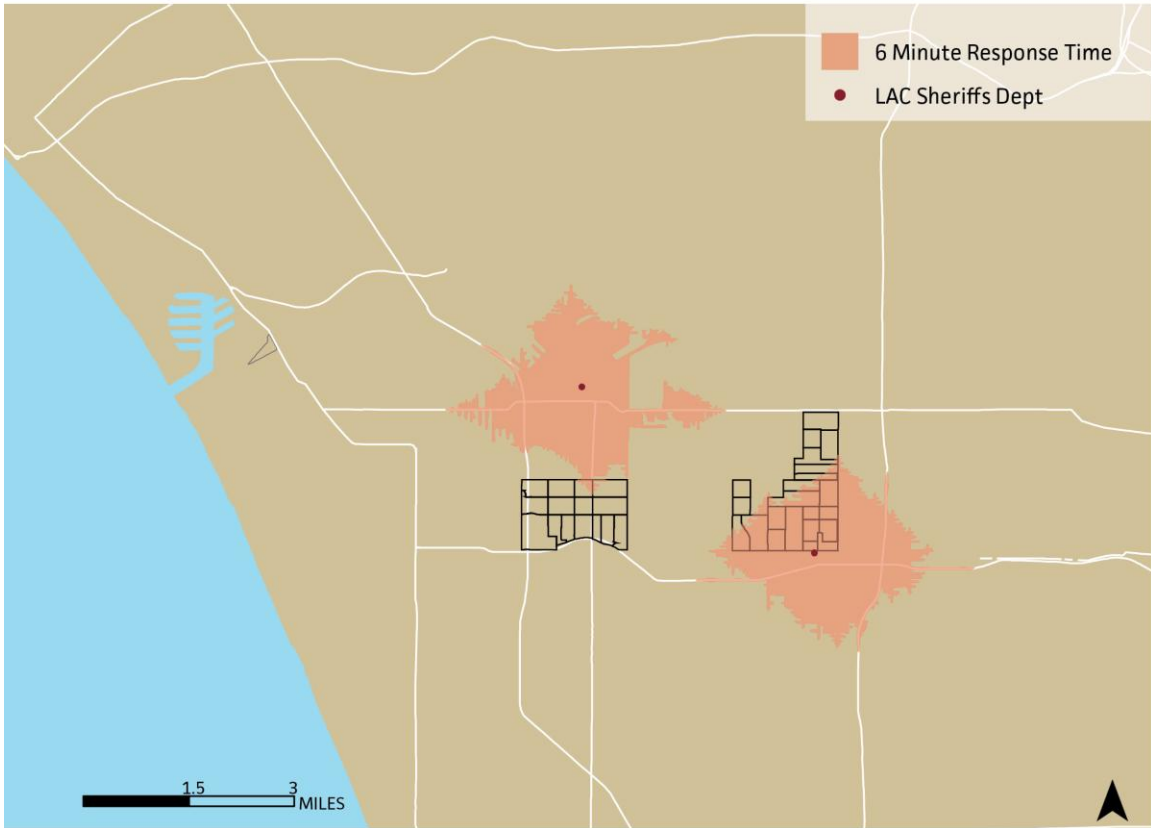


Figure 5: Access to Six Minute LA County Sheriff's Department Response Time in Lennox and Westmont.
 Source: Map Created by Lacey Sigmon. UCLA MapShare LA County Shapefiles, LA County.Gov GIS Repository.

	Lennox	Westmont
Number of Block Groups	0	12
Number of People	0	14,467
Percent of Population (%)	0	45

Table 3: Access to Six Minute LA County Sheriff's Department Response Time - Lennox and Westmont, LA

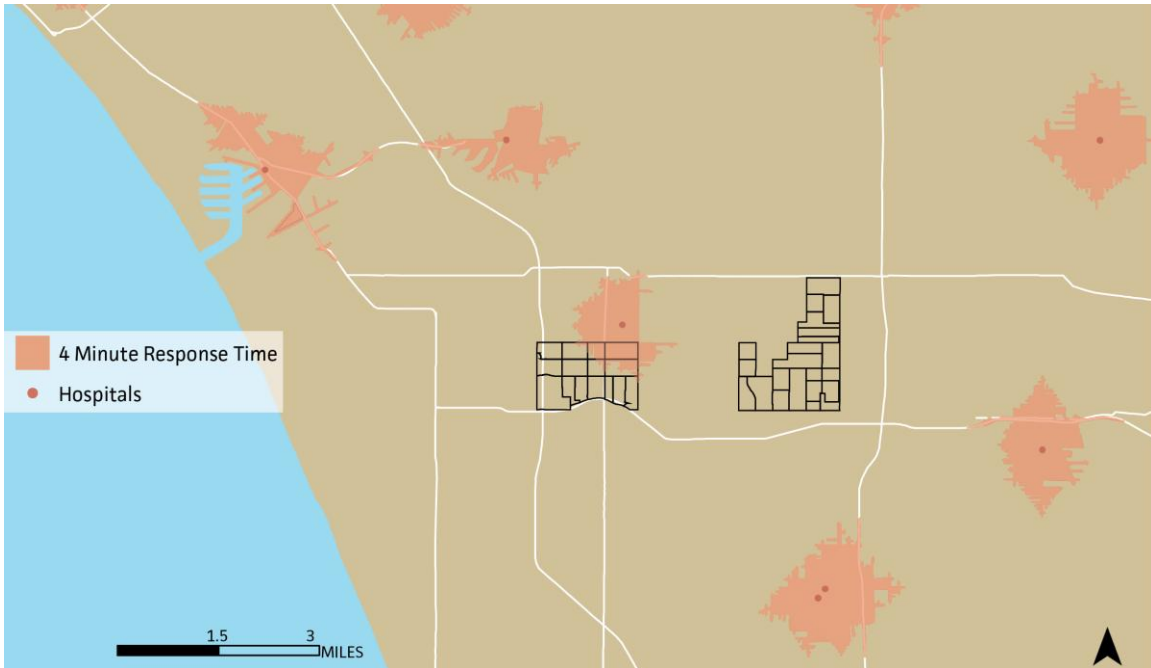


Figure 6: Access to a Four Minute Response Time by EMS in Westmont and Lennox, LA
 Source: Map Created by Lacey Sigmon. UCLA MapShare LA County Shapefiles, LA County.Gov GIS Repository.

	Lennox	Westmont
Number of Block Groups	3	0
Number of People	6,843	0
Percent of Population (%)	26	0

Table 4: Access to a 4 Minute Response Time by EMS in Westmont and Lennox, LA

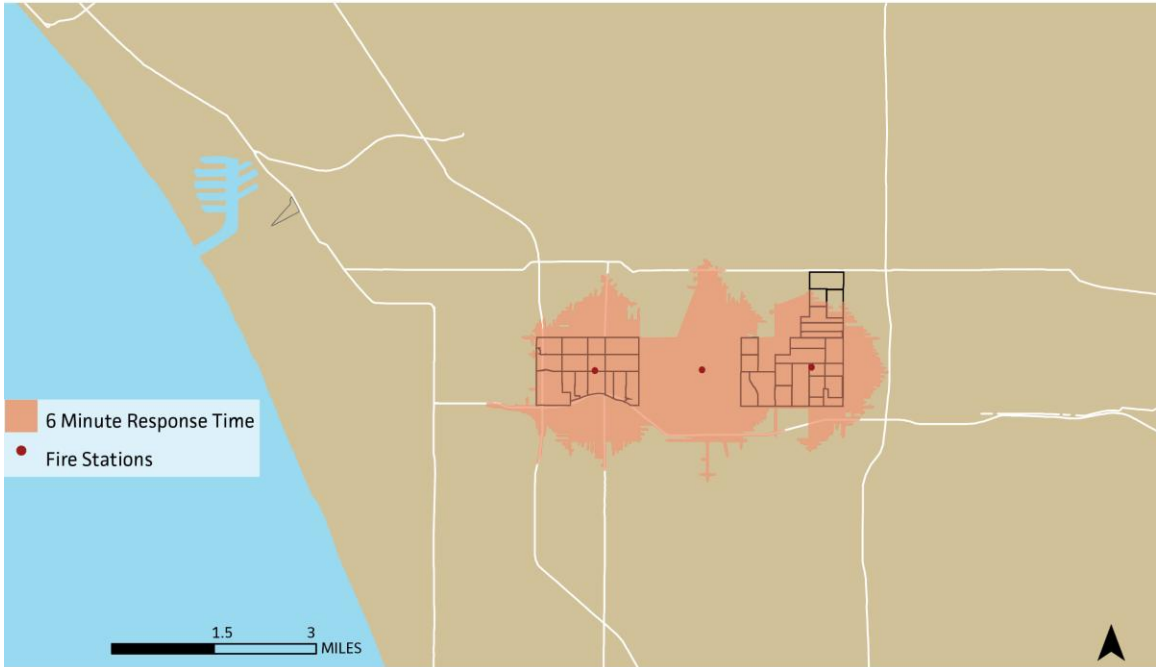


Figure 7: Access to a Six Minute Response Time by the L.A. County Fire Department in Westmont and Lennox, LA

Source: Map Created by Lacey Sigmon. UCLA MapShare, LA County.Gov GIS Repository.

	Lennox	Westmont
Number of Block Groups	15	20
Number of People	22,218	26,775
Percent of Population (%)	100	84

Table 5: Access to a Six Minute Response Time by the L.A. County Fire Department in Westmont and Lennox, LA

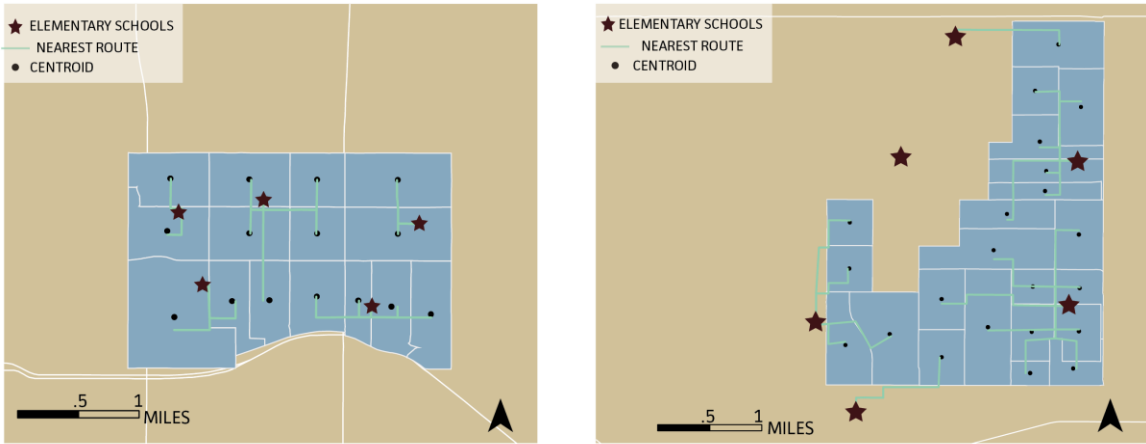


Figure 8: Access to Elementary Schools in Lennox and Westmont, LA
Source: Map Created by Lacey Sigmon. UCLA MapShare, LA County Schools.

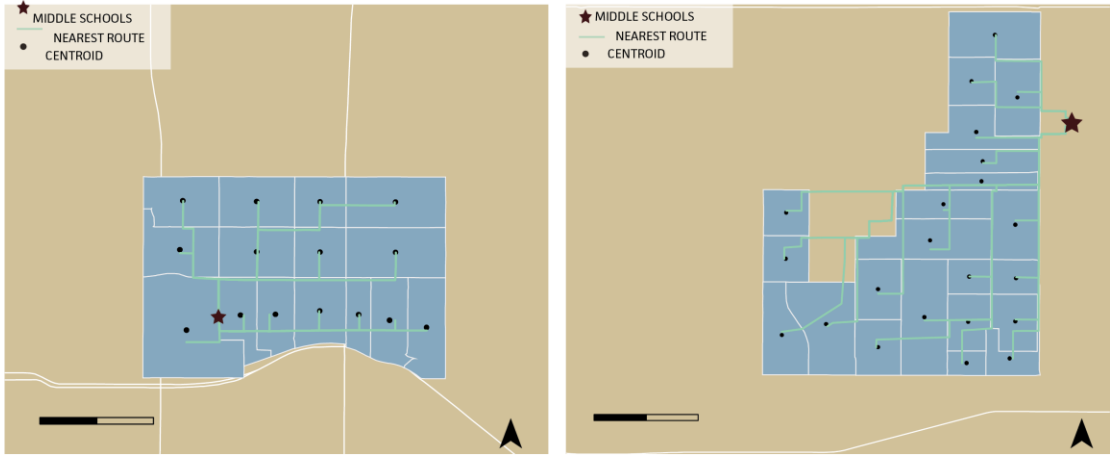


Figure 9: Access to Middle Schools in Lennox and Westmont, LA
Source: Map Created by Lacey Sigmon. UCLA MapShare, LA County Schools.

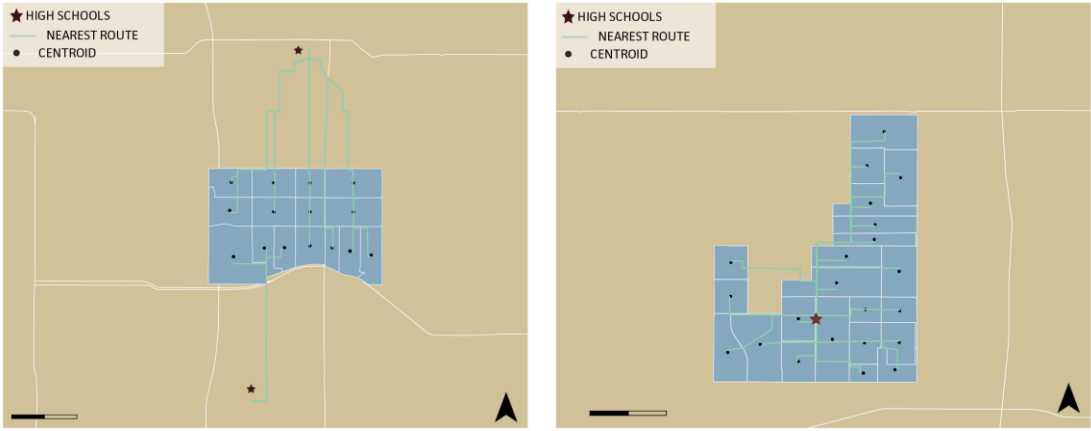


Figure 10: Access to High Schools in Lennox and Westmont, LA
Source: Map Created by Lacey Sigmon. UCLA MapShare, LA County Schools.

	Lennox	Westmont
Elementary	.26 miles	.5 miles
Middle	.75 miles	1.43 miles
High	1.56 miles	.93 miles

Table 6: Average Weighted Distance to Closest Elementary, Middle, and High School in Lennox and Westmont, LA.

	Lennox	Westmont
Jobs by Car		X
Jobs by Rail	X	
Police		X
EMS	X	
Fire		X
Elementary	X	
Middle	X	
High		X

Table 7: Neighborhood Evaluations of Access to Basic Services