

## What Factors Affect High School Graduation Rates? *An exploration of ten LAUSD high schools*

### Introduction

In Los Angeles, the difference between two high schools can make them seem like they're from totally different worlds. An inner-city school may not have access to books, afterschool activities, or breathable air. A school in the suburbs could be better funded by taxpayer dollars but has no public transportation stops within a half mile, making it out of reach for students who can't afford to live in the area but crave a higher quality education. Each student has to navigate their school's own unique barriers to graduate within four years.

My research project takes an in-depth look at a variety of factors, from transportation to economic development to the environment, in order to determine what affects high school graduation rates from ten public high schools in the Los Angeles Unified School District.

### Background Data

I chose the following public high schools at random and have ranked them in descending order of graduation rate for the 2017-2018 academic year. I then broke up the graduation rates into groups that vary by 5%. The top half of the subject schools have graduation rates from 85%-90%. The bottom half of the subject schools have graduation rates from 71%-83%. For context, the average graduation rate of all LAUSD high schools for the 2017-2018 academic year is 76.6%. Only Abraham Lincoln High School and Los Angeles High School fall below average.

School	Graduation Rate
Carson High School	89.4%
John H. Francis Polytechnic High School	88.0%
Alexander Hamilton High School	86.4%
Fairfax High School	85.9%
Hollywood High School	85.7%
Bell High School	82.8%
John C. Fremont High School	80.6%
Venice High School	79.5%
Abraham Lincoln High School	76.1%
Los Angeles High School	71.8%

Data source: Rothenbaum, D. (2019, May). DataQuest - Educational Demographic Reports.  
Retrieved from <https://dq.cde.ca.gov/dataquest/page2.asp?level=School&subject=Coh&submit1=Submit>.

I will be discussing the following factors regarding the subject school:

- Number of students in grade 12
- Percentage of students who took the SAT
- Football division standing
- Public libraries within 0.5 miles
- Number of Metro bus and rail lines servicing within 0.5 miles

along with the following factors regarding their respective census tracts:

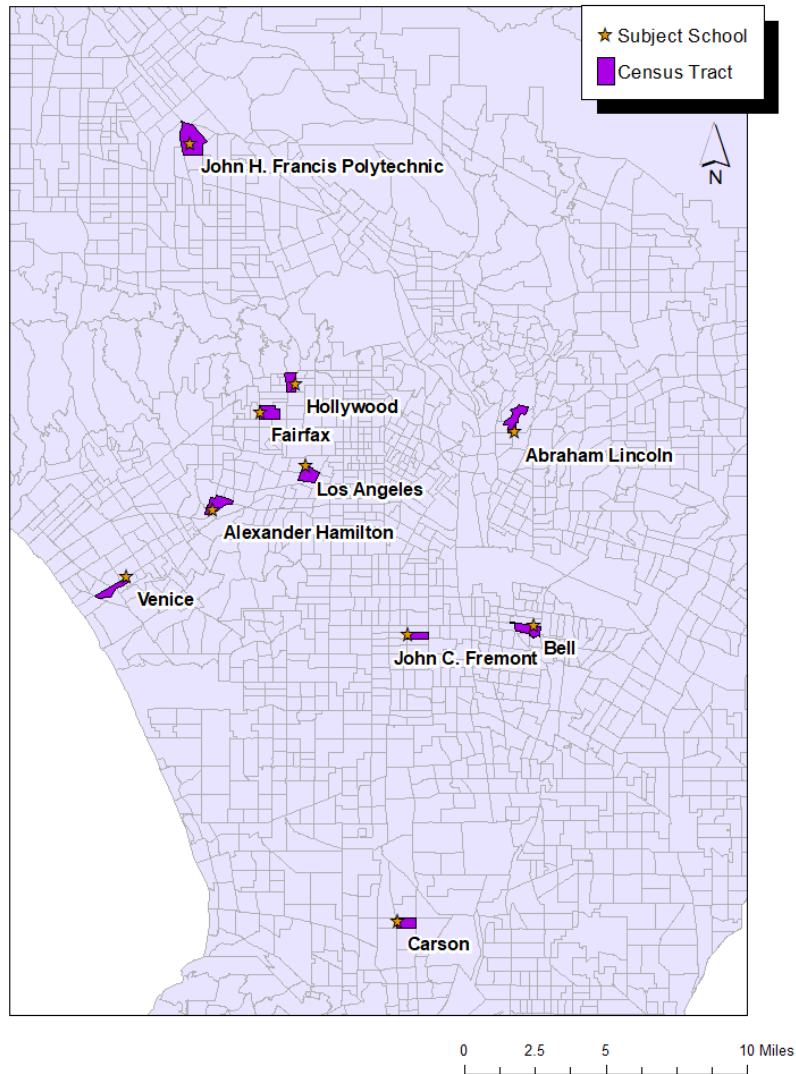
- Healthy Places Index percentile
- CalEnviroScreen 3.0 percentile
- Poverty percentile
- Traffic density percentile

In regards to factors that directly affected the subject school, I believed that larger class sizes would decrease the average one-on-one time that teachers could give to individual students, which my mother (a high school teacher herself) says is critical for maintaining student engagement and could possibly affect a student's willingness to follow through with their degree. The same reasoning applies to a student who takes the SAT. While a high score helps a student get into a good college or university, the mere act of taking the SAT shows intention to pursue a higher level of education – a process which inherently requires a high school diploma or GED equivalent. Along that same path, often students who struggle in class but excel in sports receive athletics scholarships for college and graduate high school to advance their athletic careers. Additionally, I believed that access to applicable public amenities, like transportation and libraries, would positively influence graduation rates.

As for factors that affected individual census tracts, I was mostly concerned with pollution, the overall environment, poverty levels, and density. The Healthy Places Index was helpful to understand the influence of pollution, tree coverage, and healthy food access. As you will see later in the report, it very closely corresponds with the poverty percentile census map which was determined to be the most significant impact on graduation rate. The CalEnviroScreen 3.0 had an incredible agglomeration of factors and provided a comprehensive pollution score. I used the traffic density factor as a surrogate land density factor, since I could not find a reliable data source. My reasoning was that areas with higher density would in turn experience higher levels of traffic density. As it turns out, nearly everywhere in Los Angeles experiences extreme traffic density so it was a moot point.

Factors – Subject School

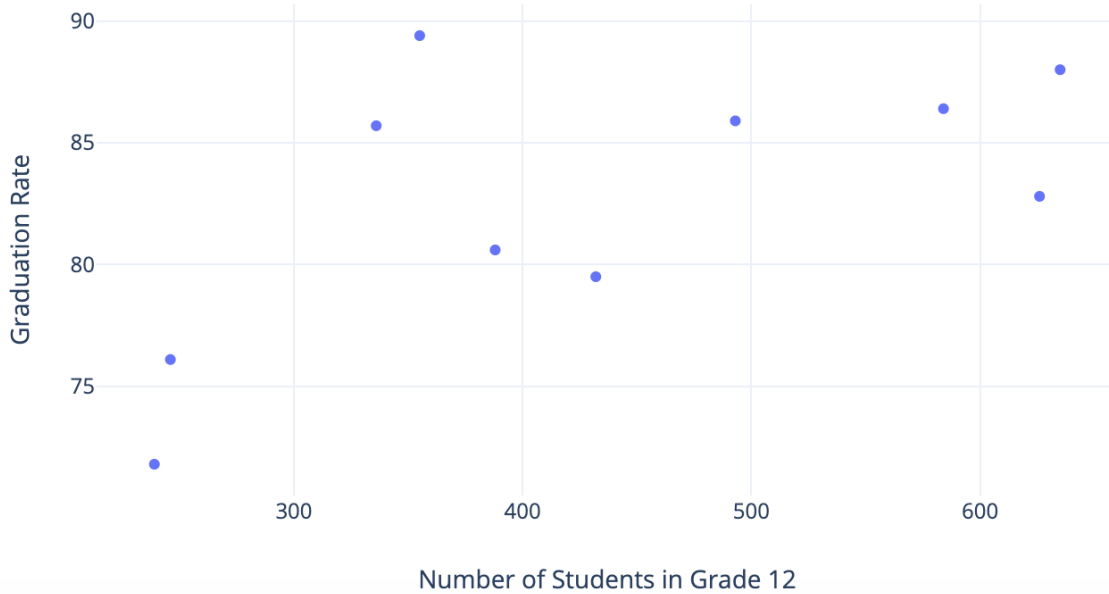
## Location of Subject Schools by Census Tract



Data Source: Locations/Points of Interest (LMS Data) – January 2016. (2016, January 15).  
Retrieved from <https://egis3.lacounty.gov/dataportal/2016/01/14/locationspoints-of-interest-lms-data/>.

The above map depicts the location of subject schools by census for reference. While most schools lie within a ten-mile radius, the following maps and data visualizations will show the great disparity between the census tracts in terms of transportation connectivity, environmental quality, and socioeconomic status.

### Grade 12 Size and Graduation Rate

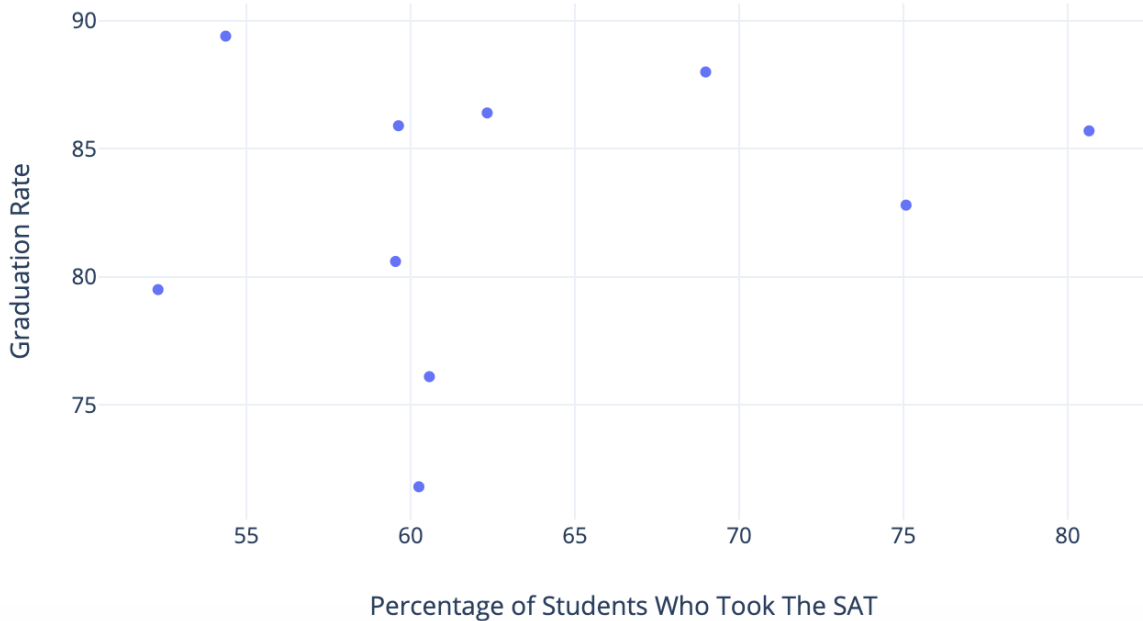


Data source: Rothenbaum, D. (2019, May). DataQuest - Educational Demographic Reports.  
Retrieved from <https://dq.cde.ca.gov/dataquest/page2.asp?level=School&subject=Coh&submit1=Submit>.

Y-coordinates are listed in descending order of graduation rate, following the chart listed under 'Background Data'. As shown in the scatterplot, there is a weak positive association with the number of students in grade 12 and the graduation rate for the 2017-2018 academic year.

The subject school with the largest graduating class is John H. Francis Polytechnic High School. The subject school with the smallest graduating class is Los Angeles High School. Besides two outliers, Carson High School, and Hollywood High School, scatterplot points towards the conclusion that a high graduation rate is related to a larger graduating class size.

### SAT Enrollment and Graduation Rate

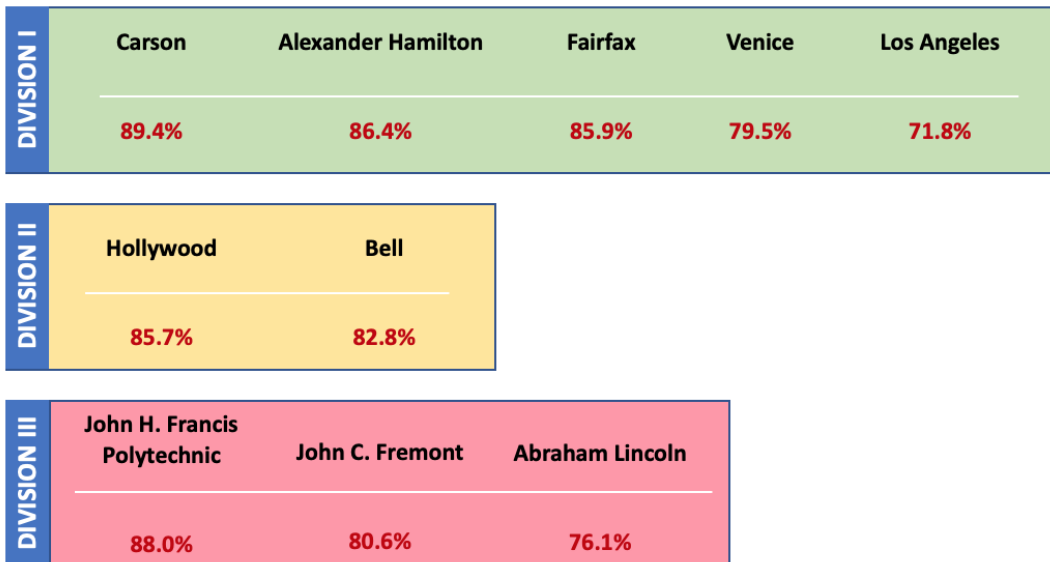


Data source: Rothenbaum, D. (2019, May). DataQuest - Educational Demographic Reports.  
Retrieved from <https://dq.cde.ca.gov/dataquest/page2.asp?level=School&subject=Coh&submit1=Submit>.

Y-coordinates are listed in descending order of graduation rate, following the chart listed under 'Background Data'. As shown in the scatterplot, there is no distinct association between graduation rate and the percentage of grade 12 students who took the SAT for the 2017-2018 academic year.

I chose this metric because taking the SAT or ACT shows some intention to apply for college, for which a student must also graduate high school. The subject school with the lowest SAT participation is Venice High School. The subject school with the highest SAT participation is Fairfax High School.

### Distribution of Football Division Standing and Graduation Rate

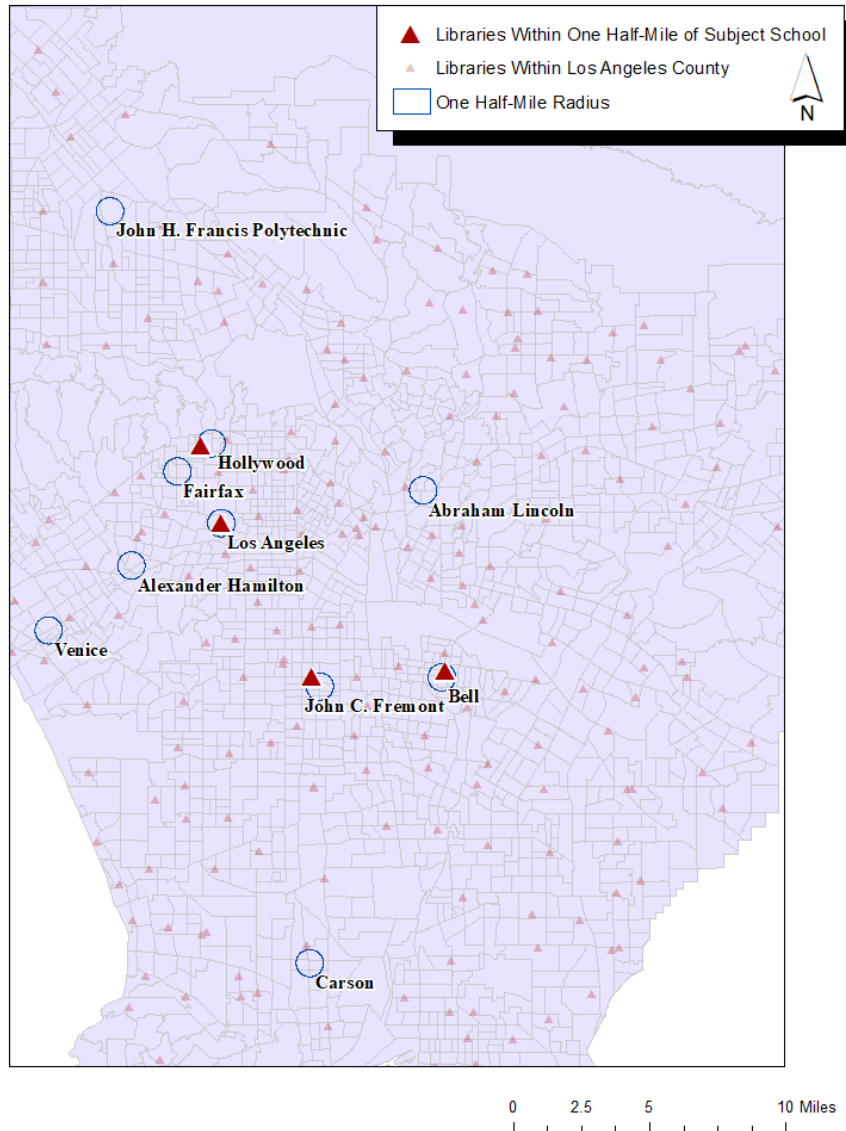


Data Source: CIF Los Angeles City Section. (2018). Retrieved from [https://www.cif-la.org/apps/pages/index.jsp?uREC\\_ID=49071&type=d&pREC\\_ID=577215](https://www.cif-la.org/apps/pages/index.jsp?uREC_ID=49071&type=d&pREC_ID=577215).

The above infographic depicts the split between graduation rate and CIF Football division standings for the 2017-2018 academic year. The schools are listed in order of division standing first, then by graduation rate within their respective divisions (Division I is the highest, Division III is the lowest). Division I has the highest concentration of subject schools from the top tier of graduation rates.

While the data does not show an association between CIF Football division standing and graduation rate, it could allude that the presence of intense athletic programs does not harm a student’s chances of graduating from high school. With this perspective, public schools could begin sourcing additional funding through athletic programs rather than relying on the state and federal government’s funding based on standardized test scores.

## Distribution of Public Libraries in Los Angeles County



Data Source: Locations/Points of Interest (LMS Data) – January 2016. (2016, January 15).  
Retrieved from <https://egis3.lacounty.gov/dataportal/2016/01/14/locationspoints-of-interest-lms-data/>.

The above graph shows public libraries that exist within a 0.5-mile radius of a subject school. Of the ten subjects, only four had a public library within easy walking distance of the school. The importance of a library nearby is that it offers a safe, quiet place to do homework or conduct research, it provides students with free access to computers and the internet if they don't have one at home, and it offers high schoolers a much-needed space to decompress after a long day of school if they have a less-than-supportive homelife.

The data does not show a relationship between library proximity and graduation rate. Only one of the four subject schools that had libraries within a 0.5-mile radius, Hollywood High School, was in the highest tier of graduation rates. The other three were in the second tier and bottom tier. It could be reasoned that students are not taking advantage of the library nearby, or that they are relying on their school library for the benefits previously mentioned.



Data Source: Metro Bus & Rail GIS Data. (2019, September 26). Retrieved from <https://developer.metro.net/docs/gis-data/overview/>.

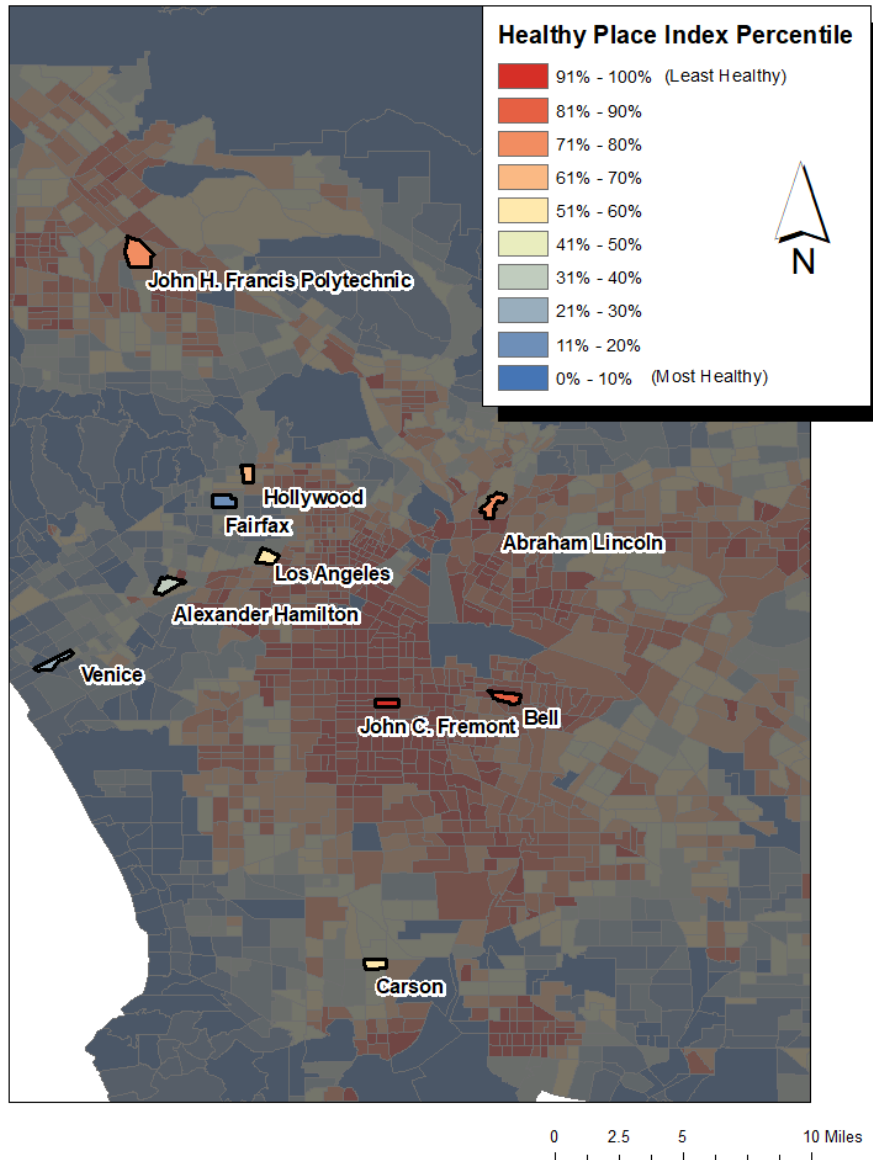
The above infographic shows a visual representation of the number of Metro bus and rail lines with stops within 0.5 miles of the subject school. It should be noted that the data for bus lines is from 2018, while the data for rail lines is for 2016 just before the Santa Monica extension opened for the Expo Rail Line. The subject schools are listed in descending order of graduation rate.

Carson High School, which has the highest graduation rate of the subject schools, has no active stops for Metro bus or rail lines. This could mean that the school is located in a residential area, or that it is solely serviced by municipal busses. There does not appear to be a relationship between transportation access and graduation rate, though it should be mentioned that the schools with the top two graduation rates are the furthest from the center of Los Angeles and may be better serviced by local lines.



Factors – Census Tract

# Healthy Place Index by Census Tract



Data Source: Healthy Places Index (HPI) 2017. (n.d.).  
Retrieved from [http://gisdata-scag.opendata.arcgis.com/datasets/ba5835578bfa4718bab24df71fca43b4\\_6](http://gisdata-scag.opendata.arcgis.com/datasets/ba5835578bfa4718bab24df71fca43b4_6).

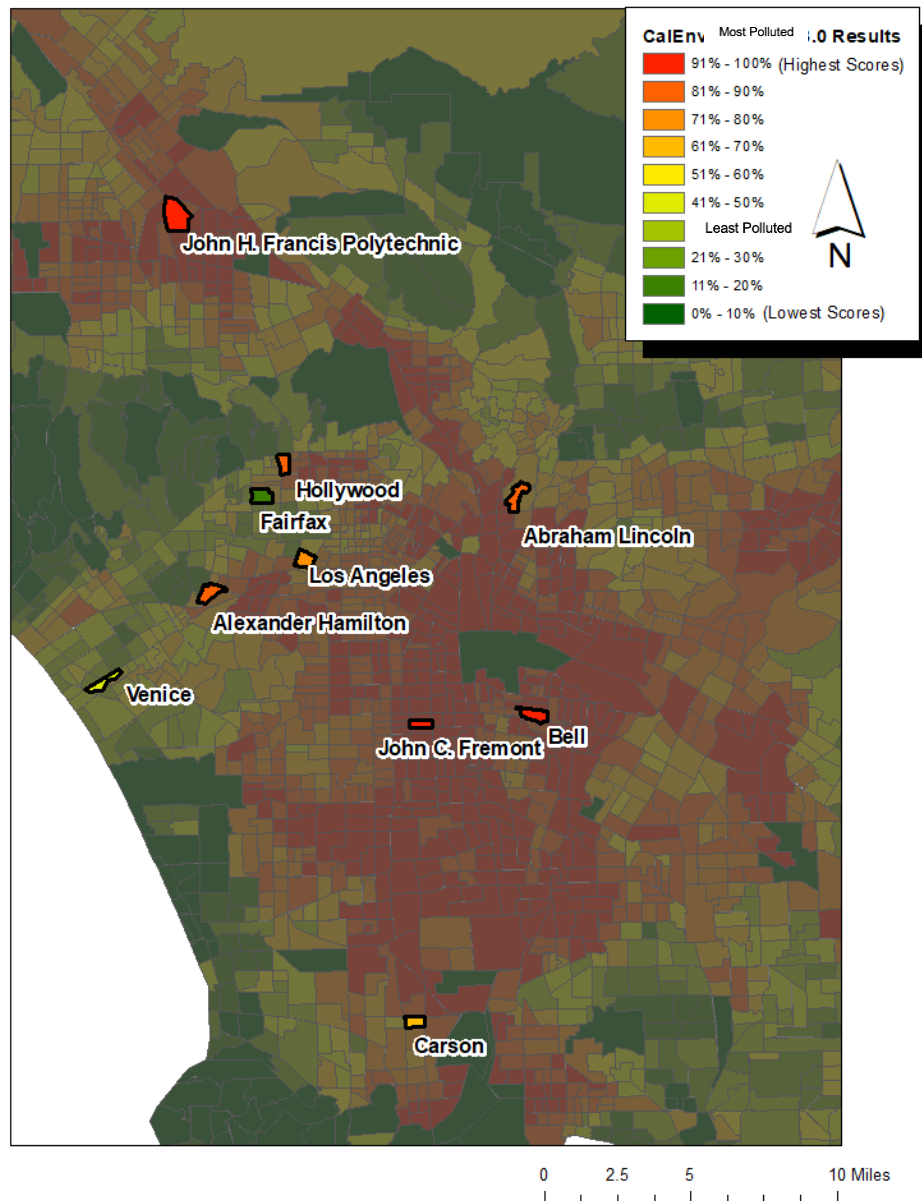
The Healthy Place Index (HPI) is a program run through SCAG’s Active Transportation Program. It analyzes census tract level data for food access, retail density, park access, tree canopy coverage to assign HPI score data for the SCAG region. I created a map based on the defined HPI percentile for each of the subject schools’ respective census tracts.

Sophia Greenberg  
December 1, 2019  
Final Project – PPD 361

There seems to be a relatively even split between the top half of graduation rates and the bottom half in terms of HPI. Besides Venice High School, the census tracts for subject schools on the bottom half of graduation rates experience high levels of unhealthiness ranging from the 51<sup>st</sup> percentile to the 100<sup>th</sup> percentile. Besides John H. Francis Polytechnic High School, the Census tracts for subject schools on the top half of graduation rates experience lower levels of unhealthiness. Hollywood High School, though it rests in the 61%-70% zone, is surrounded by extremely healthy areas.

---

## CalEnviroScreen 3.0 Percentile by Census Tract

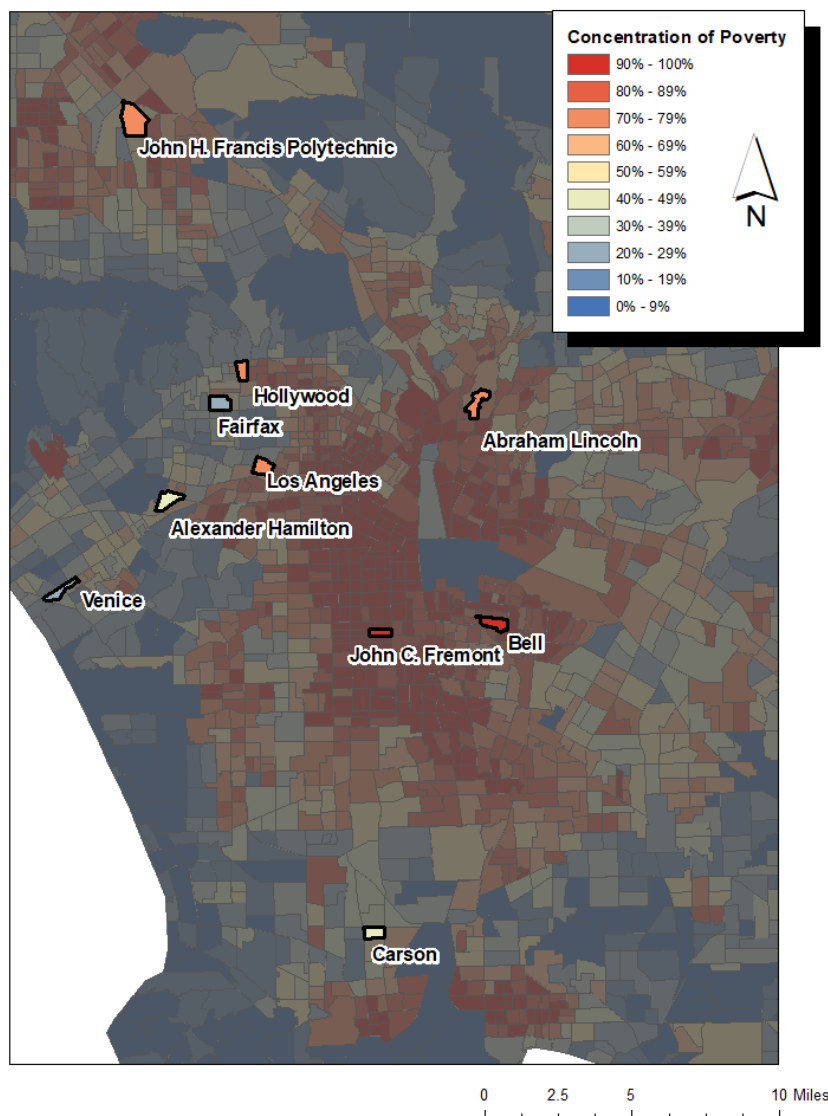


Data Source: CalEnviroScreen 3.0. (2018, June).  
Retrieved from <https://oehha.ca.gov/calenviroscreen/report/calenviroscreen-30>.

The CalEnviroScreen 3.0 is a service provided by the California Office of Environmental Health Hazard Assessment that identifies multiple sources of pollution in communities determined by census tracts. It includes factors like 8-hour Ozone concentration, drinking water contamination, hazardous waste, traffic density, and poverty. I will take a deeper look into the last two factors in the maps that follow.

This map shows the CalEnviroScreen 3.0 percentile results by census tract. There is no distinct relationship between these results and graduation rate. Fairfax High School, which ranks middle of the pack for graduation rate, has a far healthier environment than any of the other schools. Venice High School, which ranks #7 of the ten subject schools, is a close second. What this map really shows is that the further away a census tract is from the center of Los Angeles (except the Valley) the more livable the environment is. Note that this data also accounts for poverty percentile, which improves data to show the harsher environmental disadvantages poor communities face.

## Poverty Percentile by Census Tract



Data Source: CalEnviroScreen 3.0. (2018, June).  
Retrieved from <https://oehha.ca.gov/calenviroscreen/report/calenviroscreen-30>.

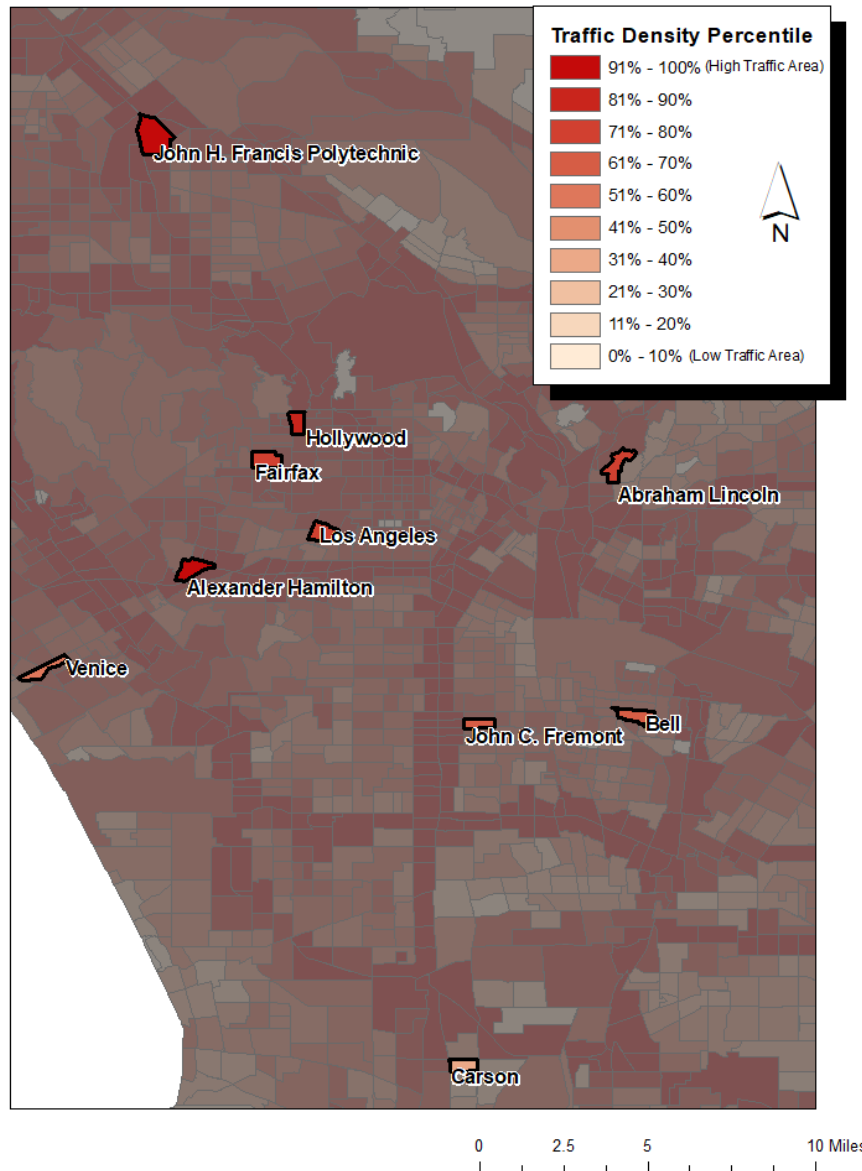
Sophia Greenberg  
December 1, 2019  
Final Project – PPD 361

The map above was sourced using the poverty data within CalEnviroScreen 3.0. It shows the percent of the population living below two times the federal poverty level. This map follows a similar pattern as the Healthy Place Index, which measures for common environmental deficiencies that exist in poorer communities. These being – among others – shaded public infrastructure, access to healthy foods and supermarkets, and surrounding land density.

While the HPI shows factors surrounding the issue, this map cuts to the root of the problem: public high schools in areas with high poverty have lower graduation rates.

---

# Traffic Density by Census Tract



Data Source: CalEnviroScreen 3.0. (2018, June).  
Retrieved from <https://oehha.ca.gov/calenviroscreen/report/calenviroscreen-30>.

The map above was sourced using the traffic data within CalEnviroScreen 3.0. It shows traffic density, in vehicle-kilometers per hour per road length, within 150 meters of the Census tract boundary.

No real conclusions can be drawn from this map given that all schools except for Carson High School are located in census tracts with extreme traffic density.

## Conclusion

Based on my analysis of the aforementioned factors, I have come to the conclusion that the following have an effect on graduation rates for the subject schools:

**Number of students in grade 12**  
~~Percentage of students who took the SAT~~  
~~Football division standing~~  
~~Public libraries within 0.5 miles~~  
~~Number of Metro bus and rail lines servicing within 0.5 miles~~  
**Healthy Places Index percentile**  
~~CalEnviroScreen 3.0 percentile~~  
**Poverty percentile**  
~~Traffic density percentile~~

By far, the strongest relationship could be seen between poverty percentile and graduation rate. Poverty brings with it a host of other well-documented issues. Low-income urban communities often face much higher exposure to pollution than their suburban or rural counterparts. Areas with low property values struggle to properly fund public schools that rely on property tax revenue to survive. Looking at the issue from the student's perspective, a teenager from a low-income family may juggle their free time between studying and holding down extra jobs to contribute to the family budget. Overall, students at schools located in areas with high concentrations of poverty have more barriers to graduation than students at schools in more affluent areas.

## Limitations

The biggest limitation I faced was sourcing data directly from schools. It was very difficult to pull together data about the schools that would help me to better understand what life was like in the school, rather than just around it. For example, Alexander Hamilton High School is a widely known proponent of the arts, and has one of the largest visual, dramatic and performing arts programs in Los Angeles County. I would be eager to see how a student's participation in a creative afterschool activity translated to their willingness to stay in school and graduate with their class.

Personal surveys would have been extremely helpful in crafting a more thorough investigation into graduation rates. It seems from this report that external factors have a relatively low effect on graduation rates. This leads to another limitation: school location does not necessarily represent where students are coming from, both from a physical and metaphorical standpoint. A student may attend Carson High School but comes from a low-income household and travel many miles to get there for a better chance at graduating. I would venture to say that what happens within the school and at home, what affects students on a daily basis, is much more strongly related to whether a student sticks with school and earns a high school diploma.