Improving Internet Access by 11x in Low-Income, Non-High School Graduate Households in LA County

Francisco Razo Gomez, Gerardo Mora, Espartaco Palma, Marlene Plasencia, Jassmine Rabii

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Background

According to the Federal Communications Commission, nearly 30 million people in the US do not have access to high-speed fixed internet service. With the rise of work-from-home and more than ~5 million school-age children pushed into online learning, this inability to access online resources has led to achievement gaps in the community which can potentially lead to a higher income and education disparity down the line.

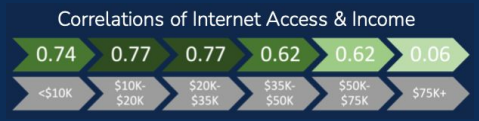
Data

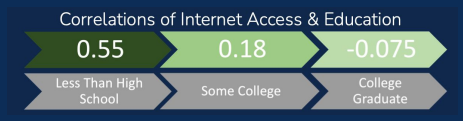
The data for this analysis was retrieved from the following sources:

- United States Census Bureau
- Los Angeles County
- NHGIS

The datasets were cleaned in Excel and Python, and joined across datasets used GEOIDs.

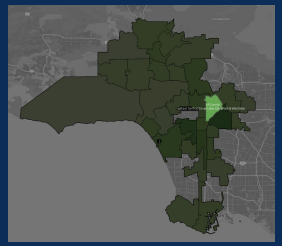
Analysis





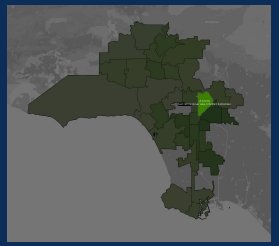
Income vs. PUMA

Los Angeles County (composed of East Central, Silver Lake, Echo Park and Westlake) has the highest Internet disparities by income levels compared to neighboring counties.



Educational vs. PUMA

A significant finding from analyzing education attainment was the high rate of people without a high school diploma in cities with limited internet access.



CURRENT

Percentage of region with wi-fi hotspots in walkable reach

PROPOSED

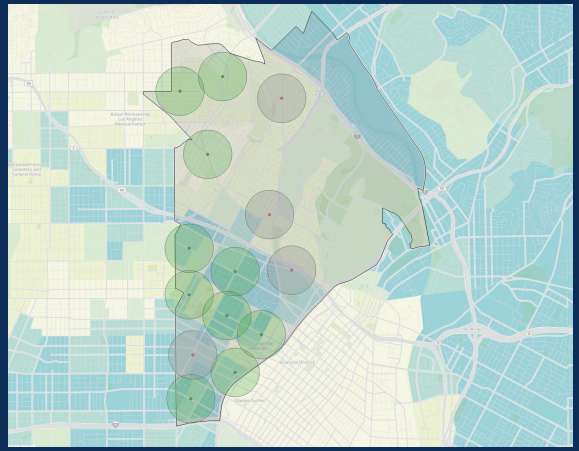
New percentage of region with wi-fi hotspots in walkable reach

IMPACT

Increase in percentage of region with wi-fi hotspots in walkable reach

Proposed Bus Stop Locations

After taking income, educational attainment, internet disparity, and existing public Wi-Fi locations (Red), into account we manually selected the following 10 bus stops (Green) as potential Wi-Fi hubs. These Wi-Fi-enabled bus stops can increase the percentage of the PUMA in walkable distance of a Wi-Fi hotspot from 2.4% to 25.9%.



Conclusion

The PUMA containing East Central, Silver Lake, Echo Park, and West Lake lacked the most internet access. We reached this conclusion by isolating households lacking internet coverage, and then evaluating the highest levels of education attained and annual incomes earned by their residents. Since the average person is willing to walk 0.33 miles to the nearest transit station we assumed they would do the same for Wi-Fi coverage, meaning the 4 Wi-Fi hotspots in the PUMA are accessible to residents living in 2.4% of the PUMA's total region (0.28 mi^2 of the total 11.98 mi^2).

By enabling only 10 of the 183 bus stops in the region with Wi-Fi, we would increase internet accessibility to residents residing in a combined total of 25.93% of the region (3.11 mi^2). This would is an increase of 1080%.

Next Steps

Going forward, we recommend creating an algorithm that uses the bus stop zone types to rank bus stops by a variety of factors, including whether it was in a residential or commercial area, the population density surrounding it, and its frequency of use. If a model were to be created, this could allow for dynamically finding the best hotspot placement.

Additionally, an issue that we faced was that we do not have knowledge of which bus stops have the correct type of electrical wiring to establish an internet connections. We had to assume that all bus stops were internet-ready when generating our conclusion, but in the future, would suggest partnering with local governments to prioritize the bus stop nodes on a weighted "system of feasibility" scale.