

Close Proximity of Tobacco Retailers to Middle and High Schools in San Diego County

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Introduction

Over 2 million middle and high school students currently use tobacco products in the United States. In California, over 20% of high school students have ever used a tobacco product, with e-cigarettes being among the most common. Current California students who vape report the ease of obtaining these products.

Tobacco 21 prohibited persons under the age of 21 of purchase tobacco products. A California law followed, prohibiting the sale of most flavored tobacco products, yet they continue to be sold statewide. Studies show tobacco and vape stores violate the Tobacco 21 law at a higher rate than other retailers.

Various articles showcase conflicting results regarding differences in tobacco usage among youth regarding various factors such as socioeconomic status and ethnicity. Higher income household as a protective factor for tobacco usage has also been suggested.

The majority of tobacco use stems from usage during adolescence. Many factors influence initiation from advertising to convenience and social influences.

Objective: To assess proximity of tobacco retailers to middle and high schools in San Diego to identify differences in proximity based on various socio-economic factors.

Methods

We conducted a quantitative study of two San Diego school districts, **San Diego Unified** and Sweetwater Unified (**Sweetwater**). Google maps was used to locate nearby tobacco retailers (**Figures A and B**).

Table 1 showcases the characteristics of the two school districts. **Table 2** showcases the different types of qualifying tobacco retail stores.

Qualifications for middle/high schools:

- Grades 6-12
- Public schools
- Non specialty/charter/online

Qualifications for retail stores:

- One-mile radius to middle/high school
- Separated by "liquor store" "smoke shop" and "convenience store/gas station"

Covariates:

- Average income levels
- Hispanic and minority enrollments
- Total economic disadvantage (percentage of students who qualify for free or reduced meals)

Figure A. Sweetwater middle and high school locations (yellow stars) and proximal tobacco retail locations (blue flags). Google Maps

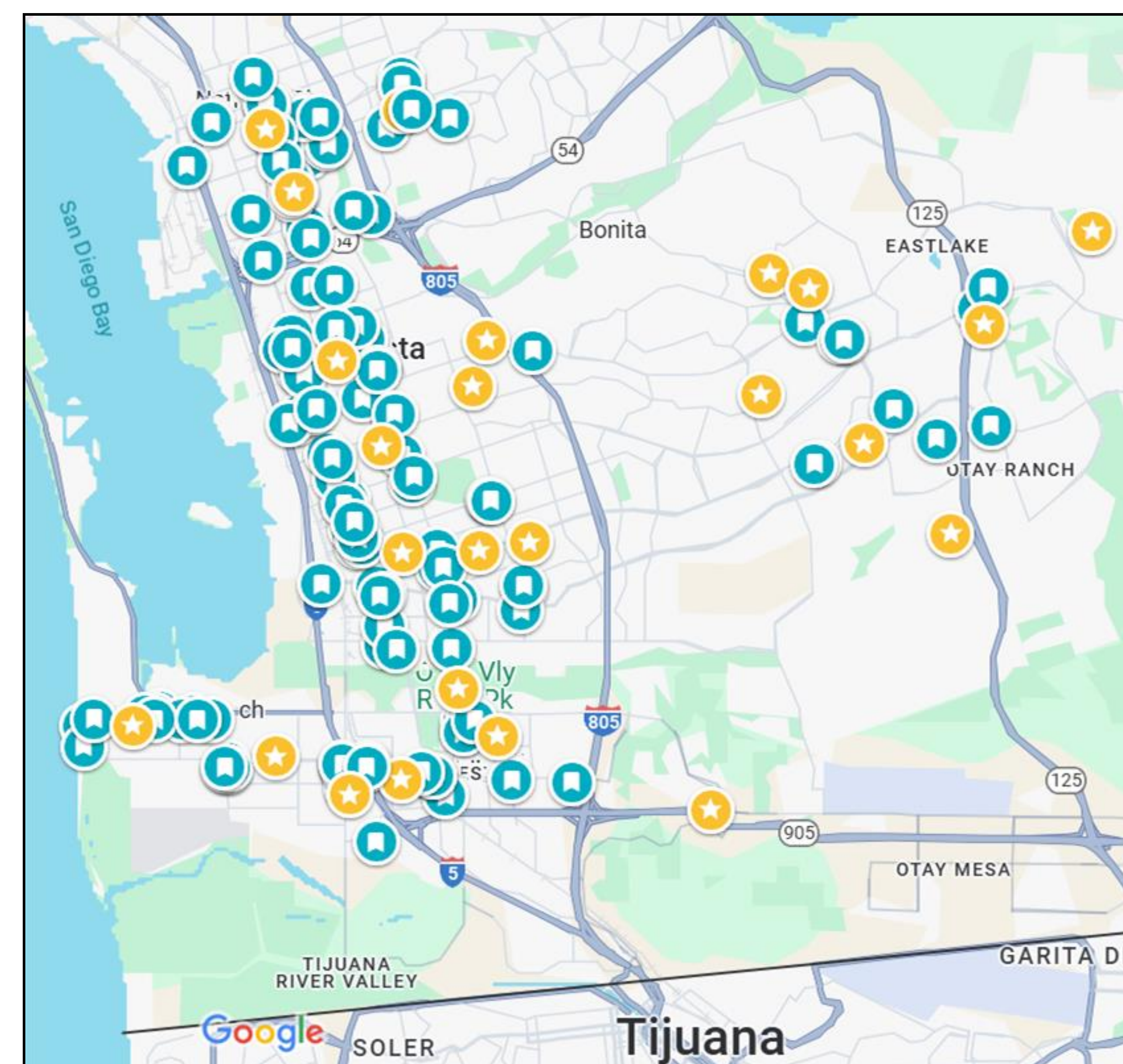


Figure B. San Diego Unified middle and high school locations (yellow stars) and proximal tobacco retail locations (blue flags). Google Maps

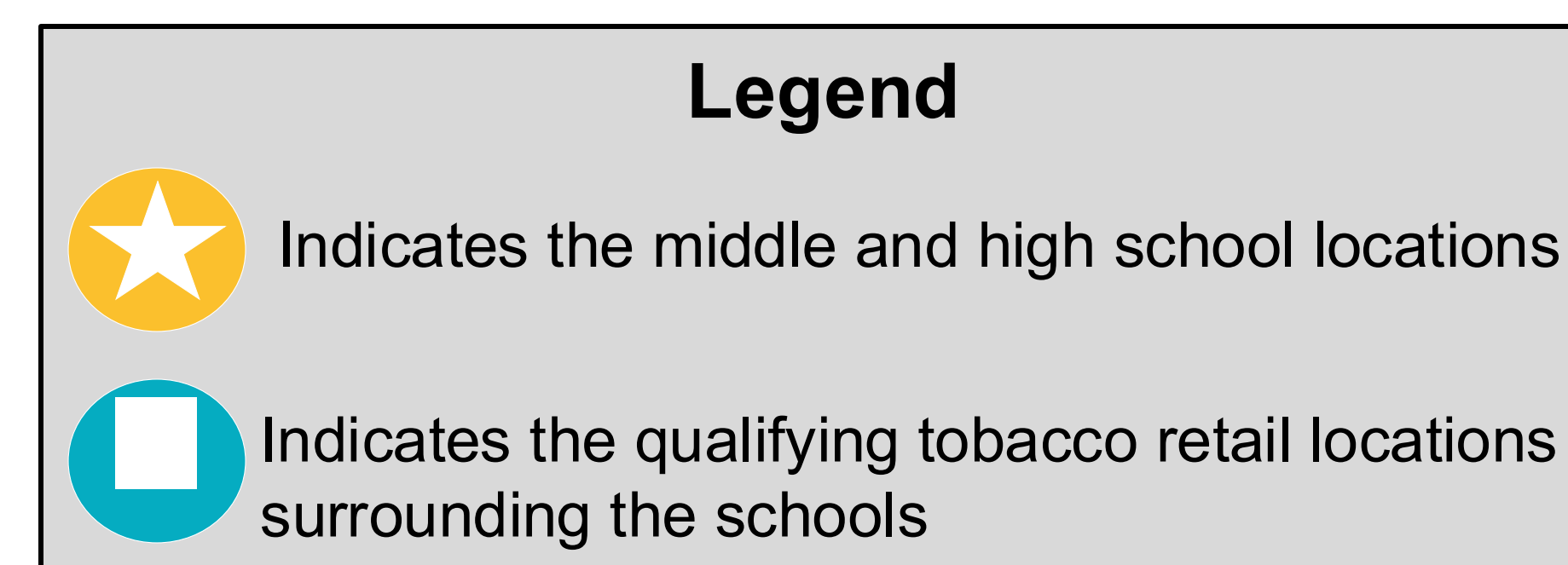
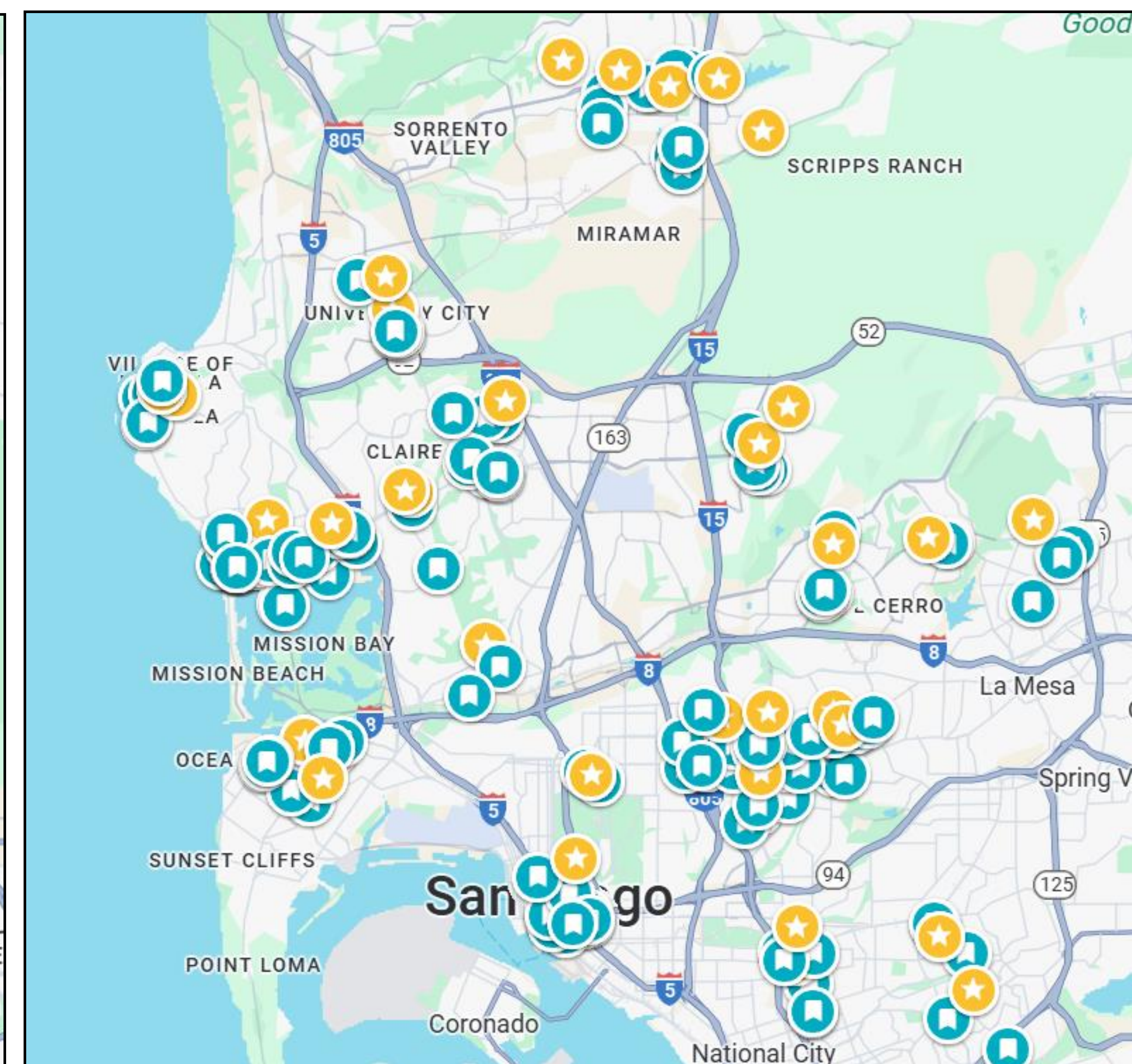


Table 1. Characteristics of Sweetwater and San Diego Unified school districts.

	Sweetwater	San Diego Unified	Total
High schools	13	15	28
Middle schools	11	18	29
Total Schools	24	33	57
Average Income per Student	\$108,000	\$130,000	\$119,000
Total Stores	196	277	473
Number of stores per school* (range)	8.2 (0-25)	8.4 (0-29)	8.3

*Calculated by dividing the total number of schools by the total number of stores.

Table 2. Breakdown of shop types in close proximity to Sweetwater and San Diego Unified school districts.

Type of shop	Sweetwater total (%) n/school	San Diego Unified total (%) n/school	Total (%)
Smoke shops	35 (18%) 1.5	62 (22%) 1.9	97 (21%)
Liquor stores	61 (31%) 2.5	77 (28%) 2.3	138 (29%)
Gas/convenience stores	100 (51%) 4.2	138 (50%) 4.2	238 (50%)

Table 3. Univariable analysis of San Diego Unified and Sweetwater school districts (combined). **p < 0.01; ***p < 0.0001

Covariates	Unadjusted OR (95% CI)	Unadjusted p-value
Average Income	< -0.001 (< -0.001, < -0.001)	0.002 **
Minority Enrollment	0.113 (-0.004, 0.229)	0.063
Hispanic Enrollment	0.125 (0.044, 0.206)	0.004 **
Total Economic Disadvantage	0.151 (0.071, 0.230)	< 0.001 ***

Table 4. Multivariable analysis San Diego Unified and Sweetwater school districts (combined). **p < 0.01

Covariates	Adjusted OR (95% CI)	Adjusted p-value
Average Income	< -0.001 (< -0.001, 6.416)	0.465
Minority Enrollment	-0.164 (-0.348, 0.02)	0.086
Hispanic Enrollment	0.07 (-0.061, 0.02)	0.3
Total Economic Disadvantage	0.147 (0.01, 0.284)	0.04 **

Results

There is a statistically significant association between tobacco retailers and both Hispanic Enrollment and Average Income (**Table 3**).

For every **\$1 increase in average income**, there is a **decrease in tobacco retailers by 0.001**

For every **1% increase in Hispanic enrollment**, there is an **increase of 0.125 tobacco retailers**

For every **1% increase in total economic disadvantage**, there is an **increase of 0.151 tobacco retailers**

The multivariable analysis (**Table 4**) confirmed a higher number of retail tobacco locations around schools with greater total economic disadvantage.

There was a **1% increase in total economic disadvantage** for every **0.147 increase in tobacco retailers**

Conclusion

Because 90% of tobacco users initiate by age 18, it is important to focus preventative methods on adolescents. By assessing the number of tobacco retailers in close proximity to public schools, we hope to gain further insight into specific inequities and ease of procurement in San Diego County to better understand how we can intervene with advertisements and tobacco sale violations through greater enforced of existing or new policies.

Our findings conclude that:

- Schools with higher economic disadvantages have greater numbers of tobacco retailers within a one-mile proximity.**
- Stricter regulations should be made to protect the Tobacco 21 law and our adolescents. Further research should be conducted to gain insight into how and why students in this area are likely to initiate tobacco usage.**

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