

# Neighborhood Deployment in Policing Activities: the Role of the Built and Social Environment in Traffic Stop Outcomes in San Diego, California

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**GIS Meet-up, Nov. 10 2022**



# Framework

- 1** Context and Literature: Built Environment, Traffic Stops, and Policing Biases
- 2** Data and Models
- 3** Results and Implications



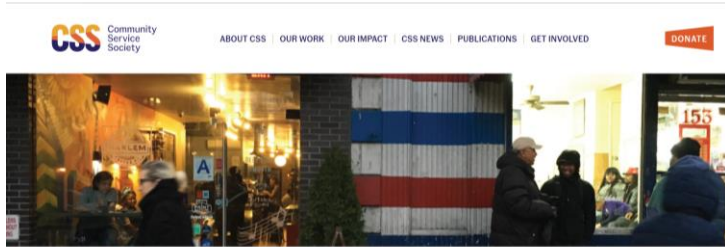
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# Context and Literature: Built Environment, Traffic Stops, and Policing Biases

# Over-policing?



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## New Neighbors and the Over-Policing of Communities of Color

An Analysis of NYPD-Referred 311 Complaints in New York City

Harold Stolper

January 6th, 2019

The tangible signs of gentrification are not hard to miss: new "luxury" high-rises and businesses catering to affluent newcomers, rising rents in older buildings, and displacement of long-time residents. But influxes of more affluent, white residents also usher in a cultural shift and conflicting views about public space. And this can result in increased police engagement as new neighbors make complaints about other neighbors.

The body of evidence documenting heightened NYPD enforcement in gentrifying neighborhoods is growing: higher stop and frisk activity by the NYPD in gentrifying neighborhoods, irrespective of local crime; more 311 complaints originating in either racially diverse or gentrifying neighborhoods of New York City; and a recent lawsuit against the NYPD linking increased enforcement to



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ANALYSIS

## There Is No One Answer to Over-Policing and Mass Incarceration — There Are Many

Examples abound for successful alternative methods that can greatly improve the current criminal legal system.



San Francisco Chronicle/Hearst Newspapers via Getty

# Racial Bias in Traffic Stops

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RESOURCE

## State Policing Reforms Since George Floyd's Murder

While the past year has seen some victories, transformative change in policing remains elusive.



Shane Martin/News Out

REPORT - OCTOBER 2022

## Racial Disparities in Traffic Stops

Magnus Lofstrom, Joseph Hayes, Brandon Martin, and Deepak Premkumar

POLICY BRIEF

REPORT PDF



Supported with funding from Arnold Ventures



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MAY 5, 2020

## Black drivers get pulled over by police less at night when their race is obscured by 'veil of darkness,' Stanford study finds

After analyzing 95 million traffic stop records, filed by officers with 21 state patrol agencies and 35 municipal police forces from 2011 to 2018, researchers concluded that "police stops and search decisions suffer from persistent racial bias."





# Literature Review from Different Disciplines

# Criminology: Traffic stop and Race







# Why RACIAL BIAS happens?



## Stereotyping people of color

**Stereotype theory** (Allport, 1955): associate people of color with dangerousness or criminality

- **African Americans** were more likely to be searched after traffic stops (Baumgartner et al., 2017; Carroll & Gonzalez, 2014; Chanin et al., 2018; Farrell, 2022; Higgins et al., 2008; Ridgeway, 2006; Roach et al., 2022; Tillyer et al., 2012).
- **Hispanics** were also more susceptible to discretionary searches (Lundman & Kaufman, 2003; Pickerill et al., 2009; Roh & Robinson, 2009).
- **However**, Fallik (2019) found that controlling for the other factors, race and ethnicity variables were not significant predictors of search outcomes.



## Place-based bias

Police presence is often more common in the crime "**hot spots**" (Brunson & Weitzer, 2009, 2011; Sherman et al., 1989; Terrill & Reisig, 2003).

- **Shares of African Americans** (Petrocelli et al., 2003; Roh & Robinson, 2009)
- **Crime rate** (Gaines, 2006)



## Ecologically structured crime

Crime is associated with specific social and built environment attributes of a place (for a review, see **MacDonald, 2015**)

- **Social disorganization theory (SDT)** (Shaw & McKay, 1942): Crime as disrupting the community's capacity to regulate social order due to structural changes
- **Routine activity theory (RAT)** (Cohen & Felson, 1979): Illegal activities are more likely to occur in specific places in time and space, where motivated offenders, suitable targets, and the absence of capable guardians converge.

# Crime prevention through environmental design



“eyes on the street”

# Crime prevention through environmental design



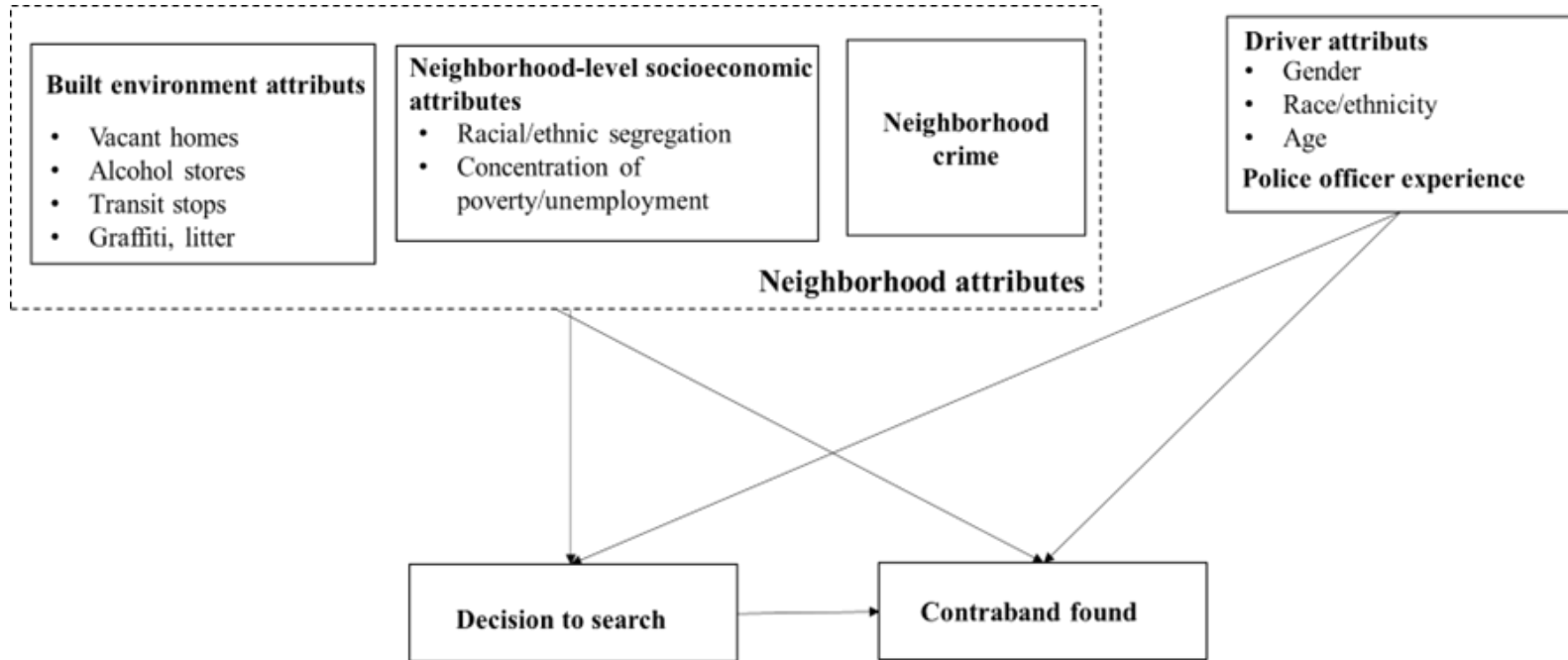




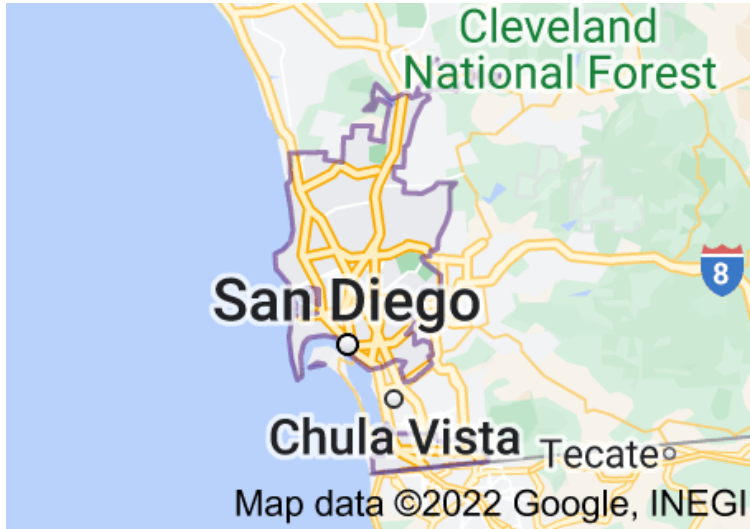
# Conceptual framework



# Neighborhood characteristics and traffic stop outcomes



# Study area: San Diego, California

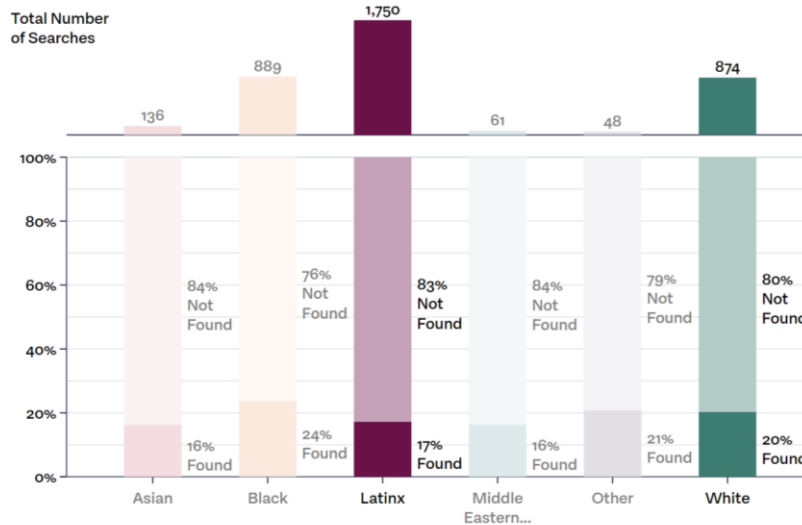


- Non-Hispanic whites: 42.3%
- Hispanics: 30.1%
- Asian: 17.3%
- African American: 6.1%
  
- Median household income: 83.4 K US Dollars

# Study area: San Diego, California

## Contraband Found and Not Found in Traffic Stop Searches

[details](#)



Source: <https://justicenavigator.org/report/sandiego-city-ca-2021/summary>



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# Data and Measurements

- **Traffic stop data:** RIPA traffic stop data: <https://data.sandiego.gov/datasets/police-ripa-stops/> (gender, age, race/ethnicity of the driver, police experience, whether to search, whether contraband is found)
- **American Community Survey 2016-2020:** Socioeconomic attributes (shares of people of color/shares of people under poverty/shares of unemployed people), shares of vacant homes of the block group where the stop occurs
- **Density of open 311 requests within a buffer of ¼ mile:** San Diego Open Data Portal (<https://data.sandiego.gov/datasets/get-it-done-311/>)
- **Density of alcohol outlets within a buffer of ¼ mile:** California Department of Alcoholic Beverage Control (<https://data.sandiegodata.org/dataset/san-diego-county-alcohol-permits/>)
- **Density of transit stops within a buffer of ¼ mile:** San Diego County Metropolitan Transit System (<https://data.sandiego.gov/datasets/transit-stops/>)
- **Number of crime incidents in the block group:** San Diego Regional Data Library ([http://library.metatab.org/sandiegodata.org-crime\\_victims-1.1.3/](http://library.metatab.org/sandiegodata.org-crime_victims-1.1.3/))



**Some details about the data  
collection and processing...**



# The role of open-sourced data in urban planning

- **Open data portal**
- **Detailed geospatial information**
- **Possibility to merge with other data sets**
- **Real-time updates**



# Geocoding process

ArcGIS StreetMap Premium

Overview Resources Pricing

## ArcGIS StreetMap Premium

Quality street data behind your firewall for map display, geocoding, and routing

ArcGIS StreetMap Premium provides offline, enriched street data for use in ArcGIS software to deliver high-quality and multiscale cartographic map display; accurate geocoding; and optimized routing, driving directions, and network analysis. StreetMap Premium is an out-of-the-box solution designed specifically for use with ArcGIS. It can be deployed rapidly on-premises behind your firewall without the need for any data preparation.

# Spatial analysis using R

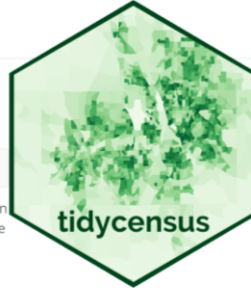
## tidycensus

**tidycensus** is an R package that allows users to interface with a select number of the US Census Bureau's data APIs and return tidyverse-ready data frames, optionally with simple feature geometry included. Install from CRAN with the following command:

```
install.packages("tidycensus")
```

**tidycensus** is designed to help R users get Census data that is pre-prepared for exploration within the **tidyverse**, and optionally spatially with **sf**. To learn more about how the package works, please read through the following articles:

- [Basic usage of tidycensus](#)
- [Spatial data in tidycensus](#)
- [Margins of error in the ACS](#)
- [Other Census Bureau datasets](#)
- [Working with Census microdata](#)



<https://walker-data.com/tidycensus/>

## 3.5.3 Spatial

**sf** provides common *geometry-generating* functions applicable to individual geometries, such as:

- `st_centroid` —Centroids
- `st_buffer` —Buffer
- `st_sample` —Random sample points
- `st_convex_hull` —Convex hull
- `st_voronoi` —Voronoi polygons

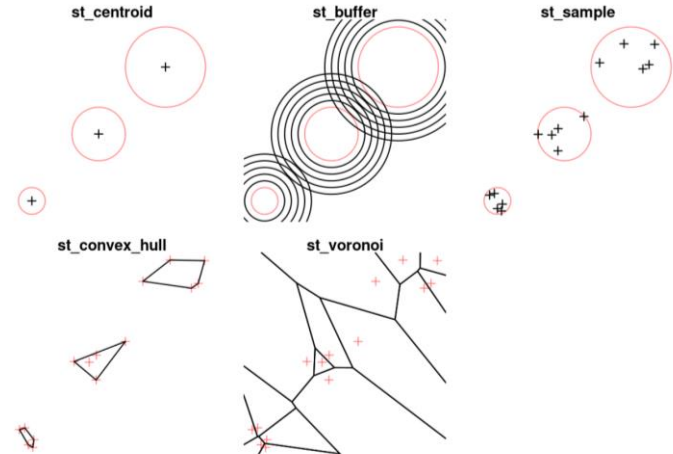


Figure 3.8: Geometry-generating operations on individual layers

[https://geobgu.xyz/presentations/p\\_2021\\_cbs/main.html#3\\_Geoprocessing\\_functions](https://geobgu.xyz/presentations/p_2021_cbs/main.html#3_Geoprocessing_functions)



# Models

## Binary logistic model for:

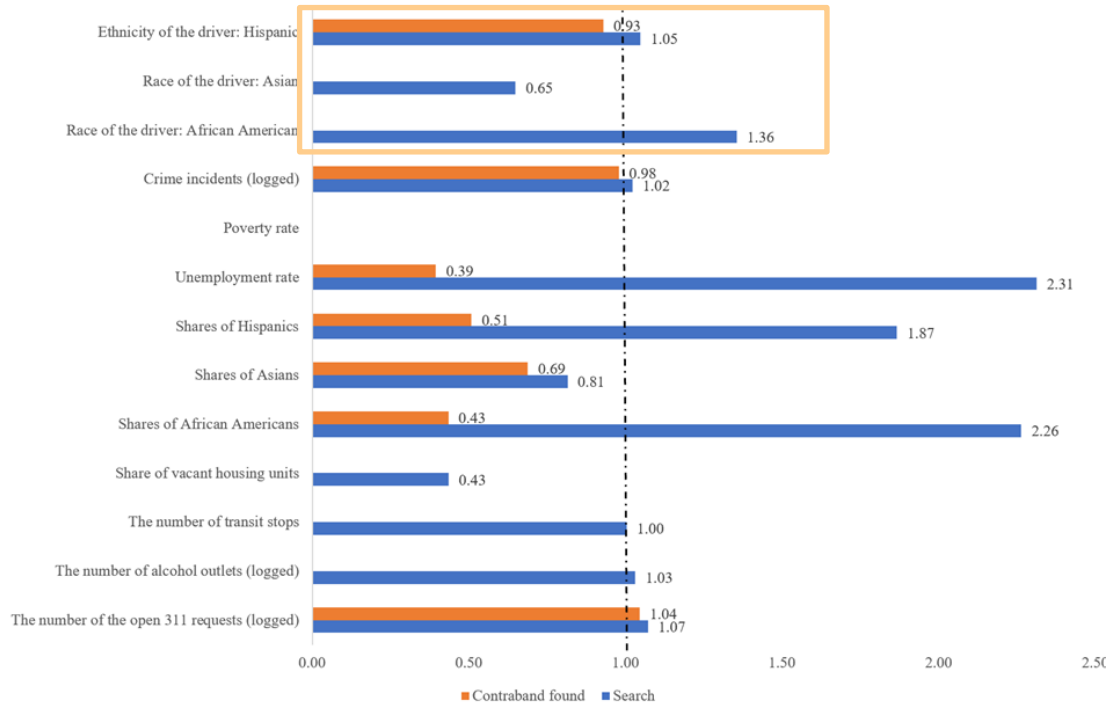
- Whether to search after traffic stops for all stops (384,748)
- Whether contraband is found after searches (26,024)



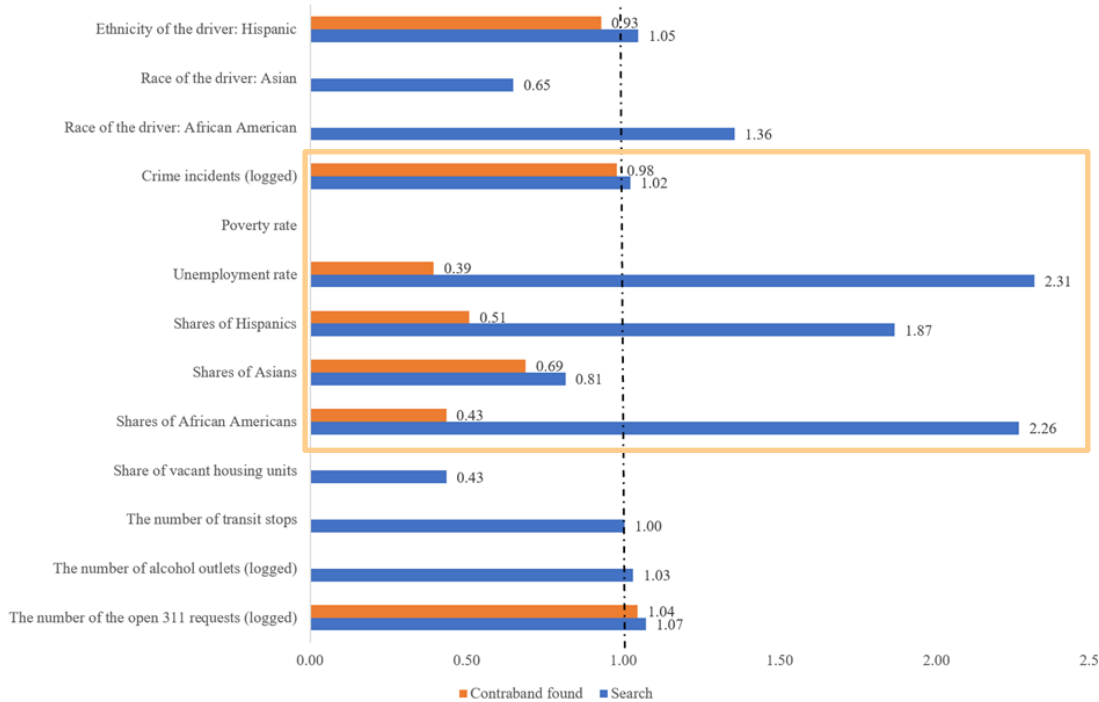
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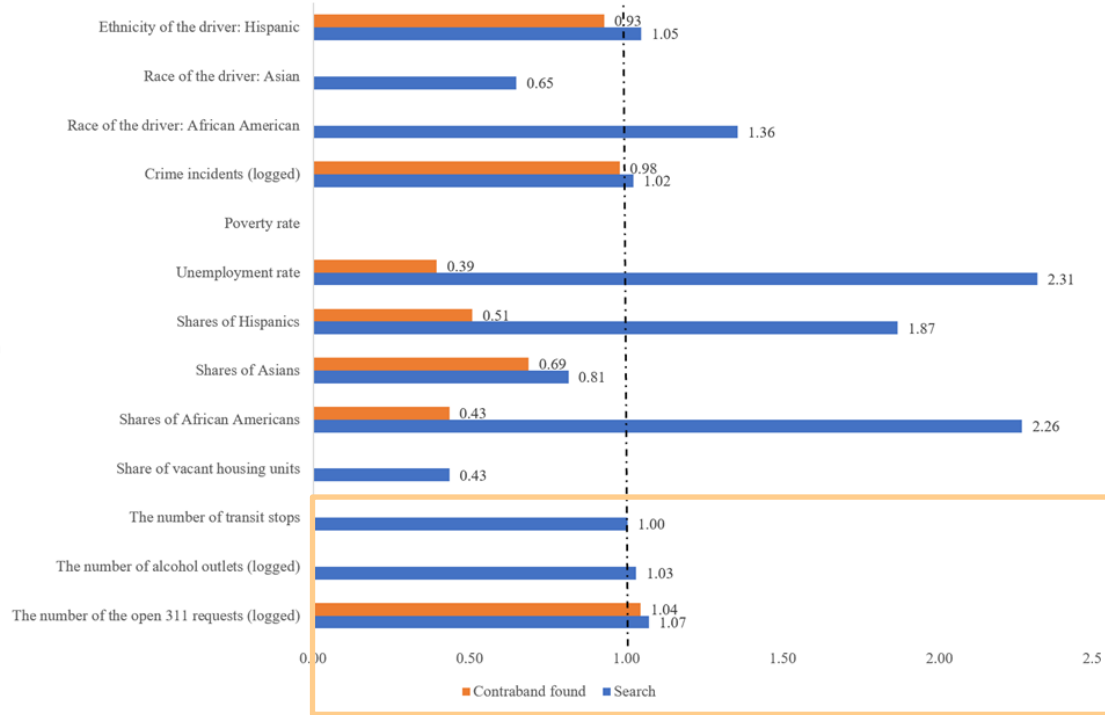
# People of color are more likely to be searched.



# Social attributes of the neighborhoods



# The built environment







# Reduce policing bias through policies



# Environmental design

- “Risky” places?
- 311 open requests and smart city initiatives



# Rethinking policing in cities

- **Automatic speed cameras? The Chicago practice**
- **Disarming the police? Berkeley, CA, and Virginia**



# Thank you! Q and A?

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