How Extraordinary Is a Police Stop With an Open Warrant?

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Abstract

The Fourth Amendment is meant to prohibit illegal stops and searches by police, but following a 2016 Supreme Court ruling in *Utah v. Strieff*, evidence collected following an illegal police stop is now admissible, if the stopped individual had an outstanding warrant.[2] The majority opinion reasoned that because the presence of an outstanding warrant is an "extraordinary intervening circumstance," the link between an illegal stop and a subsequent search was severed. We test the majority opinion and Justice Kagan's dissenting argument that stops that turn up an outstanding *municipal* warrant are routine, rather than extraordinary. We collect uncommonly available police stop data from the Austin Police Department and open Austin municipal warrants to investigate the distribution of warrants and modeled likelihood of a stop yielding a warrant. We find that while such a stop is indeed an extraordinary event in Austin's wealthier neighborhoods, it is a routine occurrence (happening at least once a week) in poorer, predominantly Latino and Hispanic neighborhoods. We also explore and simulate how warrant stop risk varies across demographic groups, income, or neighborhoods. Our results suggest that in St. Louis, MO (a city with a much higher overall rate of outstanding warrants), certain neighborhoods likely have a warrant prevalence nearing 100%.

Legal Background And Motivation

To safeguard citizens against illegal search or seizure, judicial precedent since *Nardone v. United States* (1937) has held that evidence obtained under an impermissible search is 'fruit of the poisonous tree' and is excluded from consideration.[1] *Utah v Strieff*, a 2016 Supreme Court decision, carved a new, law enforcement-friendly exception to the exclusionary rule. Evidence seized through a search after an illegal stop conducted by law enforcement is now admissible upon discovery of a valid warrant.[2] Law professor Orin Kerr, writing for Scotusblog, discusses how this case in practice encourages police officers to conduct illegal searches and seizures. To investigate a suspect, an officer needs only to stop a suspect, check their ID, and upon discovering a warrant, are free to legally search the individual incident to arrest.[3]

The Fourth Amendment, meant to protect against unreasonable search and seizure, has been severely eroded in recent years by the combination of focused over-policing, severe financial and legal penalties for minor infractions. This Supreme Court ruling further extends police search powers. People who have outstanding arrest warrants, even for minor issues like delinquent traffic tickets, now face a new legal risk of arbitrary stop and search by police. As Justice Sotamayor notes in her dissent, "The Court…holds that the discovery of a warrant for an unpaid parking ticket will forgive a police officer's violation of your Fourth Amendment rights."[14]

The majority opinion reasoned that because the presence of an outstanding warrant is an “extraordinary intervening circumstance,” it severs the link between an illegal stop and a subsequent search.[14] They relied on the attenuation doctrine, which finds evidence “is admissible when the connection between unconstitutional police conduct and the evidence is remote or has been interrupted by an intervening circumstance.”[15] However, Justice Kagan, in her dissent, argues that it is a common police practice for officers to check a person’s identification. These officers know that running an ID will routinely surface an open warrant.[14] And “in short, [warrants] are nothing like what intervening circumstances are supposed to be.. [especially given the] staggering number of such warrants on the books.”[14]

It is indeed concerningly common for people whose income limits their ability to pay off citations or whose race makes them disproportionate targets of police activity to face outstanding warrants. However, the geographic extent and prevalence of these warrants is not well understood, in part because the data is often privileged or difficult to obtain.

This leads to a broader set of questions we explore in this paper. What is the prevalence of individuals who have outstanding warrants originating from low-level citations who are now subject to searches and seizures? And how might the risk vary across demographic groups, income, or neighborhoods?

Given the volume of *municipal* warrants and over-policing, especially in some neighborhoods, we then investigate the probability of whether stops with warrants are common, rather than extraordinary events.

Literature review

Official data on the overall type and prevalence of warrants is scarce and coarse. In her dissension opinion in *Utah v. Strieff*, Justice Sotomayor relied on an incomplete, volunteered count by the Bureau of Justice Statistics that there were roughly 7.8 million open warrants in 2014.[4] The true number is likely much larger. A more recent investigation, in 2018, found at least 5.7 million open arrest warrants in the 27 states where data were available.[5] Another evaluation, just of New Jersey (which was not included in the previously cited investigation) reported 2.5 million open municipal-court bench warrants.[5] Based on those two studies alone, this suggests that in 28 of 50 US States, there are at least 8.2 million open warrants. And both reports did not collect data from populous states like California, Pennsylvania, Georgia, and North Carolina.

All studies reviewed find that many open warrants are a result of unpaid, low-level municipal citations and traffic violations. These warrants result from minor infractions

and are most commonly found in high poverty, majority-Black and -Hispanic neighborhoods[5]

The volume of open or issued warrants is striking relative to population. In 2016, a New York City report found there were “1.5 million open arrest warrants for minor crimes, about one for every six New Yorkers.”[5] In Ferguson, Missouri municipal courts *issued* each year one municipal warrant for every two residents, 92% of which were issued to Black residents.[5 6] At the time of the Ferguson report, 16,000 residents had outstanding warrants in a town of 21,000.[5 6] Nearby in St. Louis, Missouri, a 2020 study found between 2011 and 2019, on average each year one municipal warrant *issued* for every 3 residents.[7] The authors of the St. Louis report found there were 296,985 open, outstanding warrants in 2014, a rate of 99 open warrants per 100 St. Louis residents.[7]

City level per-capita estimates in New York and Missouri suggest stops that surface a warrant are the rule, rather than the exception for residents stopped by police in certain neighborhoods in U.S. cities.

However, detailed study of the prevalence and concentration of warrants has been hampered by limited data. Municipal Court records are kept separately across each local jurisdiction and are rarely made openly accessible (in part due to valid concerns for privacy).

This lack of data is reflected in the majority and dissenting opinions in *Strieff.* Guy Padula notes with concern in a West Virginia Law review article how little the Justices actually understand about warrants in the United States. In oral argument, “Justice Elena Kagan admitted she was ‘surprised beyond measure’ by the number of outstanding warrants in America.”[13] And, as we note above, this count she was so shocked to discover is likely an underestimate. Justice Alito, also in oral argument, found it unlikely that traffic courts might routinely issue warrants *en masse*.[13] However, Justice Sotamayor pointed out that, “Alito had a shockingly antiquated conception of this process” and did not realize most warrants are automatically issued by computerized default.[13]

Data

Warrant Data

This project made use of publicly available warrant and municipal court data from Austin, Texas collected from online databases. Austin’s sheriff department has a searchable database of outstanding warrants and the city’s municipal court has a separate database with detailed records about each case.[8 9] The Python package

Selenium was employed to simulate a test browser for the web scraping. Traditional html based parsers, like BeautifulSoup, could not be used for this type of scraping: both websites are built in Microsoft ASP.NET and only reveal desired data elements after interacting with Javascript-based elements like buttons or drop downs. We spun up an Azure-hosted Postgres database to store each scraped data element into 6 structured tables.

We ran a two-stage web scraping process. Using our web-scraping program, we first searched the sheriff database inputting each possible date of birth for individuals up to 110 years of age. This allowed us to compile a complete list of individuals in Austin who have outstanding municipal (non-criminal) warrants. Once we had that list of names compiled, each active case was then searched in Austin Municipal Court's public inquiry database through searching by last name and date of birth. Again, we used a web scraping program to create a dataset that consists of each person's name, race, gender, age, approximate home location (down to a street level but not exact address), citation, current warrant dollar amount, and each violation event and corresponding date. Not all of the names that were scraped from the list of individuals in Austin who have outstanding municipal warrants had a corresponding case within the Austin municipal court public inquiry database. This could be due to asynchronous updating of the two separate websites as cases get resolved or added. These names without case information were removed from our dataset.

After scraper development and testing, the entire scraping process took approximately two weeks to run. To ensure we scraped responsibility, we limited the scraper to 3 concurrent requests with timed waits to avoid overloading the government websites.

Stop Data

In 2015 Sanda Bland, a 28 year old Illinois woman, died by suicide in the Waller County Jail days after being arrested following a routine traffic stop. Texas then enacted the Sandra Bland Act of 2017 which mandated the collection and reporting of any traffic stop that involved a citation or warning.[12] To comply with this expanded reporting requirement, the Austin Police Department releases traffic and non-traffic stops on the Austin Open Data portal. We pulled data for the most recent year available (2019) for our analysis.[13] Data were combined and deduplicated by stop ID number.

Geocoding

For further spatial analysis, we geocoded these locations. The Municipal Court records include an abbreviated home address for nearly every individual with the name of the street (e.g. Jay Street would be represented just as 'Jay'), city, state, and ZIP code, in most instances as a 9-digit code (ZIP plus 4). Thus the exact location (e.g. specific

house) cannot be determined—perhaps for privacy reasons—but the location can be approximated within a reasonably small area. Many streets in Austin are fairly short, so the street name alone defines a small area. Alternatively, the ZIP code + 4 defines a limited number of houses, generally one segment and side of the street in a postal delivery route.[20] Ninety-seven percent of records included both a street name and ZIP code. ArcGIS World Geocoding Service was used to geocode addresses and was able to match 87 percent of records to an individual street segment.[21] We manually reviewed addresses that matched to other (coarser) locations and kept only those that had correctly matched to a point of interest in Austin. Records for 1,323 individuals listed the location as “transient.” These and other records without a reliable location needed to be removed. We then filtered the data to only those locations within Travis County (the county Austin sits within). Removing the records without matched locations or with locations outside of Travis County pared the database to 20,600 records of individuals. Of these, 14,267 individuals had locations within the city of Austin.

Our study can only suggest a minimum concentration of warrants and the records without accurate location information that were removed are one additional source of underestimating the true prevalence of warrants.

IPUMS Demographic and economic data

We additionally used U.S. Census American Census Survey data, filtered to those living in Austin. Within this data, we can see individual- and household-level demographics and other factors that might impact an individual’s ability to pay a warrant. These factors include age, annual income, ownership of dwelling, monthly gross rent (to calculate factors like rent burden), linguistic isolation, access to the internet or a smartphone, citizenship status, educational attainment, and employment status. This data is collected at the PUMA (Public Use Microdata Area) level, which portions out non-overlapping geographical areas that contain 100,000 people each, and also at the Census Tract level which divides data into relatively compact areas of approximately 4,000 residents each. This data is then used to see how outstanding warrant geographical distributions correlate with demographic factors.

Ethical data handling

We were able to find very detailed information on the open warrant records through two municipal websites. This level of data availability with such sensitive information poses privacy risks to the individuals. Our research only used data that was already made publicly available; nonetheless it represents a possible invasion of individual privacy. Individual records have been aggregated in this project to avoid exposing personal information. Individual records that have been scraped for this project will be deleted upon completion.

Exploring distribution of warrants across population

Data distributions exploration

We conducted exploratory analysis of the distribution of warrants across the population, the prevalence of individuals with outstanding warrants, and the spatial distribution of these prevalence rates.

Spatial distribution

Locations of individuals with warrants were spatially joined with Census Tracts, individuals were summed by Tract, then this number was divided by the total Tract population as a measure of warrant prevalence.

The relative spatial concentration of warrants, compared to clustering or segregation of other demographic factors, was computed using Moran's *I*, an index of spatial autocorrelation. This index compares the deviation from the mean at each pair of neighboring locations to the overall variance; a higher value indicates positive spatial autocorrelation, or that neighboring locations are more similar to one another than would be expected by spatially-independent processes.

Exploring correlations between warrant prevalence and demographics

Exploratory analysis compared both the count and total balance due and prevalence of individuals with outstanding warrants to several indicators of demographics and socio-economic status. A visual inspection of maps and scatter plots found few connections between variables. Where there seemed to be a relationship, bivariate regression models were fit to test the strength of the relationship. Spatial lags (the mean value at all other Tract locations, weighted by the inverse distance from the location) were computed and added to regressions to control for spatial autocorrelation in the independent variable.

Comparing distribution of warrants with demographics and indicators of cost-burden

Somewhat surprisingly, few demographic measures were seen to correlate closely with warrant concentrations.

The strongest demographic indicators of warrant prevalence were indicators of area income and the Hispanic or Latino population. Spatially-lagged linear regression of the

log of warrant prevalence rate by tract median income, the best-fitting model, showed an R^2 score of 0.45 (see Figure 1).

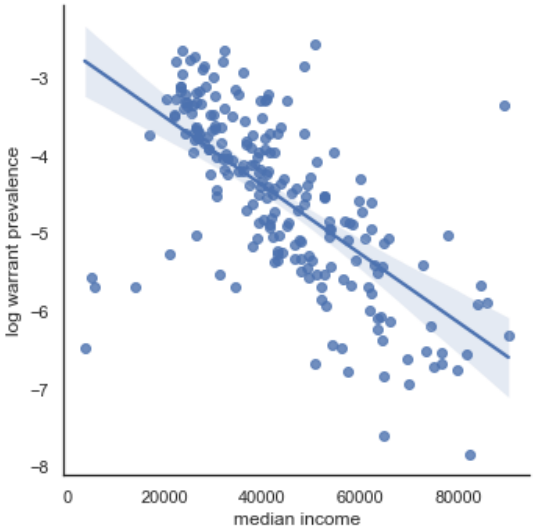


Figure 1: Linear regression of log of warrant prevalence rate by tract median income

The total number count of Latino or Hispanic residents in a Census Tract also correlated linearly with the prevalence of warrants. The spatially lagged regression showed an R^2 fit of 0.44. Counts or proportions of other racial and ethnic groups were seen to be uncorrelated to warrant concentration.

Other indicators of cost burden that might influence an individual's ability to pay a citation, like the percent of rent burden, access to the internet, access to a smartphone, educational attainment, linguistic isolation, and employment status, were also tested against the prevalence of warrants. Similar to the demographic values, there was not a significant correlation between most of these variables and outstanding warrant concentrations. The two variables with a high correlation were the percentage of the population who are linguistically isolated, with an R^2 value of 0.85 and the percentage of the population without access to the internet, with an R^2 value of 0.88. Individuals who have unpaid citations that are about to be converted to a warrant receive an email or a letter of warning. If individuals do not have access to the internet or are unable to read official letters, individuals with outstanding citations may not even be aware a deadline is approaching. The corresponding graphs comparing the warrant distribution and variable distributions can be found in Appendix A.

Distribution of warrants over the population and across neighborhoods

Extant data and research showed the aggregate number of warrants outstanding in several cities or jurisdictions (St. Louis, New York City, New Jersey), but without distributions, it is difficult to know the scale of the number of individuals affected.[5] If a small number of individuals were subject to many warrants each, or if a high proportion of warrants were issued against individuals living outside the municipal jurisdiction, then the local effect (measured in terms of the prevalence of individuals with outstanding warrants) could be small.

We found that in Austin individuals with warrants against them had, on average, 1.99 warrants each. Nearly half (48 percent) of individuals had a single outstanding warrant, an additional 28 percent had two warrants (see Figure 2). From an overall ratio of 6.8 *warrants* per 100 residents, we find a more illuminating ratio of 1.4 *individuals* with outstanding warrants per 100 residents.

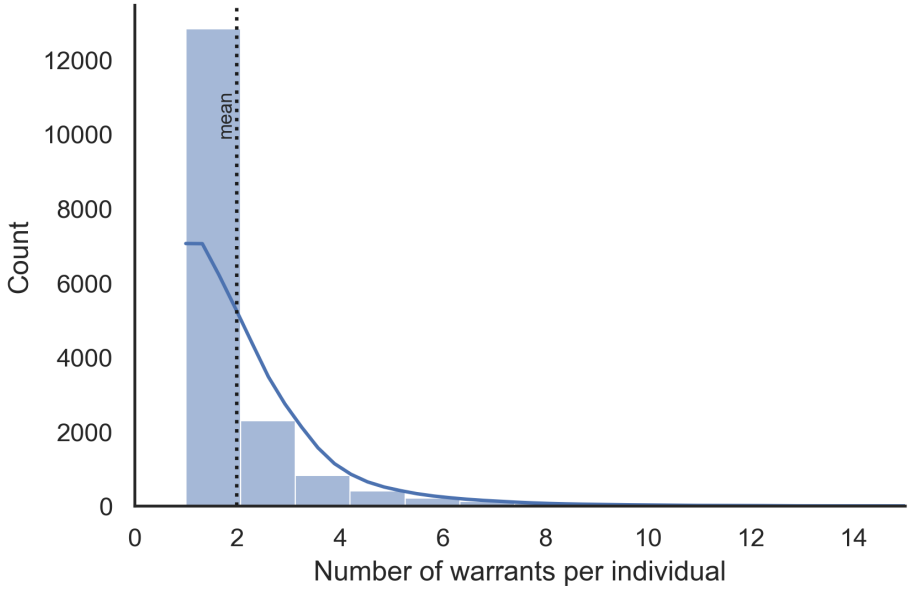


Figure 2: Distribution of warrants per individual in Austin, TX

Scaling this overall rate to cities with a higher base level of outstanding warrants gives an indication of the number of individuals affected. Applying the same ratio of outstanding warrants to individuals affected to St. Louis suggests that in that city, 22 percent of individuals have one or more warrants against them (see Figure 3).

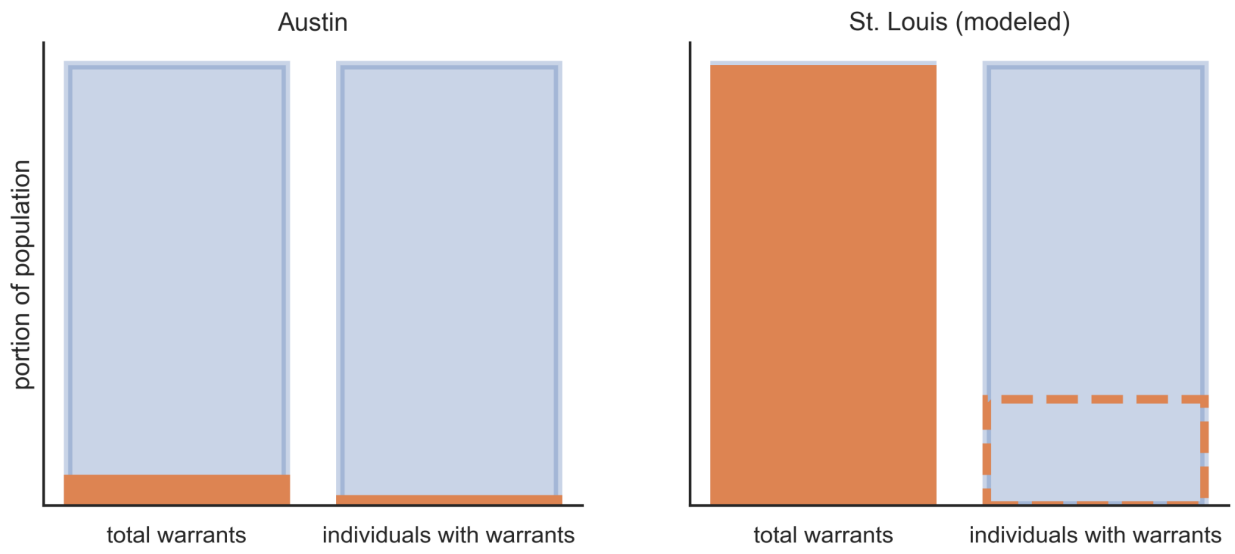


Figure 3: Comparing Austin to St. Louis (modeled) of total warrant to individuals with warrants

Moreover, the prevalence of warrants is not evenly distributed spatially: a few neighborhoods are home to the bulk of the individuals with warrants. In Austin, the Census Tract with the highest warrant prevalence has a rate 4.4 times the citywide prevalence, or 3.6 standard deviations above the mean. If neighborhoods in St. Louis have a similar distribution of warrants compared to the city mean, then some areas of that city have a 100 percent warrant prevalence.

Austin and St. Louis obviously differ in many ways, so it may be inaccurate to extrapolate the spatial distribution of warrants from the former to the latter. The comparison is not baseless, however. The overall income segregation between the two cities (measured by Moran' *I*) matches closely and in Austin, area income was shown to be one of the strongest demographic indicators of warrant prevalence (although it explains slightly less than half of the spatial variation).

Dragnet Policing Under Strieff

If *Strieff* stops really aren't an extraordinary circumstance, police officers can use this to their advantage by utilizing dragnet policing. Dragnet policing involves any system of coordinated measures for apprehending individuals who are suspected of a crime. Police officers who use this type of policing can conduct more stop-and-frisk searches, which would lead to more minor citations of illegal possessions in certain neighborhoods. More citations would lead to more unpaid tickets and more small crimes transferring to open warrants. This would provide more cover for police officers to utilize the *Strieff* ruling to cover unconstitutional stops, especially in neighborhoods where there is high policing and high open warrants. This type of policing, in combination with

utilizing the *Strieff* ruling as legal cover for unconstitutional stops, could lead to individuals being targeted for smaller petty crimes that turn into warrants. These smaller petty crime fees incur more of a financial burden for those who are not able to pay them off immediately, leading to a downward cyclical effect in certain disadvantaged neighborhoods.

Police officers can check the database when conducting a simple traffic stop and be influenced if they see that the individual in question has an open warrant. Officers could view the individual as more dangerous, which could pose a physical danger to the person who was stopped. Officers could also detain and arrest someone who was stopped for a simple citation.

Police officers can use the *Strieff* ruling as post-hoc justification for an otherwise unconstitutional stop, especially in areas with a high prevalence of outstanding warrants. This safety net for officers could lead to an aggressive enforcement of low level warrants. A $50 traffic violation can quickly turn into several hundred dollars due to court fees and late fees.[11] If an individual could not afford to pay the original citation fee, a low level citation could turn into an open arrest warrant. This impacts the working class disproportionately due to the burden to pay the original cost. Individuals who are not able to afford the original violation are more likely to be subject to a Strieff stop.This may provide more legal cover for police officers to target neighborhoods where more people have unpaid outstanding warrants or even to hand out more low level citations in the first place.

Warrant Stop Probability and the Attenuation Doctrine

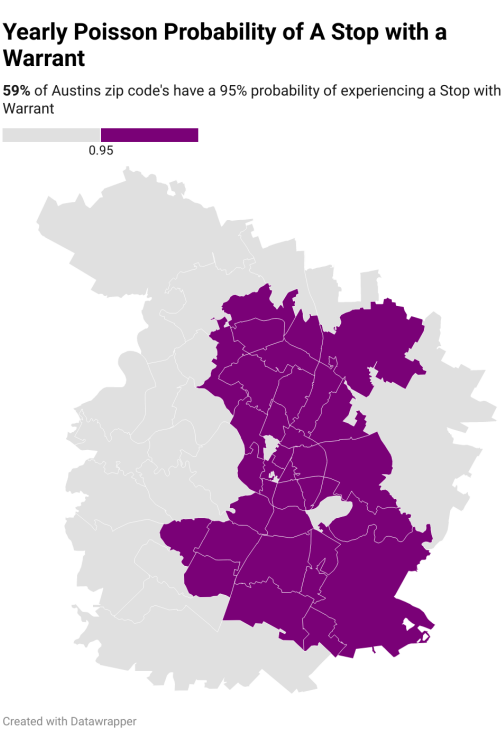
In *Strieff*, the Court “considered the presence of a valid arrest warrant to be an ‘extraordinary intervening circumstance’” which overcame the attenuation doctrine because the warrant was “entirely unconnected with the stop” and the officer did not engage in any flagrant misconduct (the officer’s actions were, “negligent at best.”)[14] Dissenting Justices disagreed, and Justice Kagan argued that, [warrants] are nothing like what intervening circumstances are supposed to be.. [especially given the] staggering number of such warrants on the books.”[14]

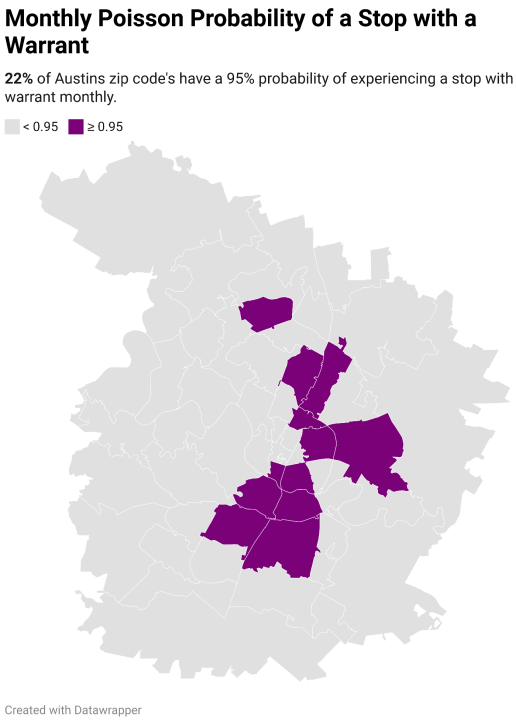
To test whether warrants are extraordinary or staggering in number, we model the probability of whether stops that turn up warrants are common occurrences in a given Austin, Texas neighborhood. We define a neighborhood as a ZIP code for this analysis.

We calculate the probability that there will be at least one stop of an individual with an outstanding warrant in a given zip code within each of three time periods: yearly, monthly, and weekly. This is based on the likelihood that any random person stopped

has a warrant against them, which we take to be the prevalence of individuals with warrants within that area; and the number of stops, which we have records for.

We assume that a stop with a warrant in a given time period can be modeled as a Poisson distribution. We specify λ (the portion of stops that yield warrants) as the number of unique individuals with at least one open warrant, divided by the population over 16 years old, multiplied by the average number of total police stops in the ZIP code. We then calculate the theoretical probability using a Poisson cumulative distribution function. We use Python's SciPy package to simulate the probability that a stop with a warrant for a given Austin ZIP code is greater than 0 at each time period we specified. λ, with population held constant, will increase based on either the number of stops or number of warrants in a given ZIP code.





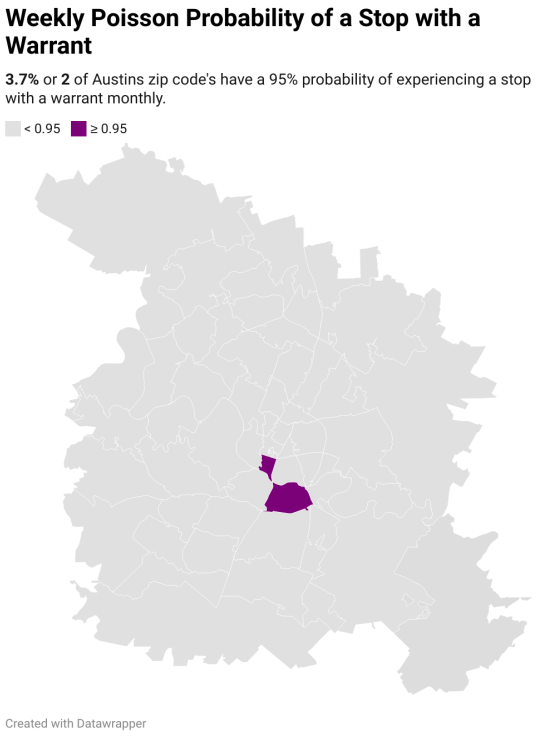


Figure 4: Poisson model distribution of zip codes with at least 95% probability of experiencing a *Strieff* stop within a given time interval

We find that 59% of Austin's ZIP codes have a 95% probability of experiencing at least one stop that finds a warrant each year. Monthly, only 22% of Austin's ZIP codes have a 95% probability of experiencing such a stop. And finally, in 3.7%, or two, of Austin's ZIP codes a traffic stop that uncovers a warrant is a likely weekly occurrence.

Randomization and the Fourth Amendment

We find evidence to support Kagan's assertion. While a stop with a municipal warrant in Austin's wealthier neighborhoods is indeed an extraordinary event, it is a routine occurrence for poorer, predominantly Latino and Hispanic neighborhoods.

When the Supreme Court majority ruled in *Strieff* they dismissed the defendant's counter arguments that the officer engaged in flagrant misconduct that amounted to a "suspicionless fishing expedition".[14] And they argued "that *Brown's* purpose and flagrancy factor" could provide protection against a police force that decided to use *Strieff* to engage in a dragnet search policy.[14] However, they did not reckon with Justice's Kagan's suggestion that the scale of warrants rendered those considerations as secondary.

Police in Austin need not engage in a coordinated dragnet style of policing to ensnare individuals with outstanding warrants. Our model is based on Austin's existing policing levels and strategy. Officers complying with the letter of *Strieff* could, with general *negligence*, make illegal stops at random and in some neighborhoods expect to find a municipal warrant weekly. On the sole condition that they were policing in a poor neighborhood with open municipal warrants, officers are now afforded the opportunity to conduct a search that is still considered a Fourth Amendment violation in many wealthy, white neighborhoods.

And Austin, Texas's warrant prevalence and stops are low relative to other jurisdictions like those in Missouri. From our initial simulated results in St. Louis and findings from DOJ on Ferguson's Municipal Court, there are some jurisdictions where a combination of over policing and predatory municipal courts result in neighborhoods saturated with open warrants. A given stop in an area where nearly 100% of the population have low-level warrants implies that for some places in the United States, *Strieff* has stripped entire neighborhoods of their ability to successfully argue a Fourth Amendment violation.

This leads to an open legal question. Are there neighborhoods where the sheer prevalence of open warrants in an area means that no reasonable person would conclude that finding a warrant is "unconnected with the stop", rendering *Strieff* moot on a neighborhood level?[14] Existing Supreme Court precedent has found that Fourth

Amendment considerations can apply in a placed-based fashion. *Illinois v. Wardlow*, for example, let courts "use *high crime area* as a factor to evaluate the reasonableness of a Fourth Amendment stop."[19]

The ruling in *Strieff* also raises issues for those who support randomized policing. Certain scholars like Harcourt and Meares argue that randomized searches should be considered as the "very lodestar of a reasonable search,"[18] They argue that individual suspicion ignores the reality of policing which is tailored to a search program, e.g. targeting open air drug markets or patrol based stops. Randomization best embodies the values of the Fourth Amendment, they argue, and provides "privacy protection" and "evenhandedness".[18] However, we have shown that randomized policing in an Austin neighborhood with a high prevalence of open warrants means that Fourth Amendment protections are not evenly distributed.

Further research

To investigate the probability that an officer stops someone with an open warrant, we ideally would have access to stop-level data elements similar to what is needed to calculate the hit rate. The hit rate is an outcome measure of discrimination that measures the "proportion of stops…with an outcome…that suggests the guilt of a stopped individual" like illegal weapons or drugs.[15] Instead of a guilt outcome, we seek the number of stops where an officer could potentially have searched an individual incident to arrest due to the presence of an active warrant. This could be a binary flag for whether an officer ran a warrant check on any person stopped. This would allow us to estimate the true prevalence of stops with an open warrant. And would likely include criminal and municipal warrants from multiple jurisdictions. Our data in this study is limited to Austin's Municipal Court.

In addition to conducting an analysis with more granular data, further research would benefit from studying a jurisdiction with higher warrant prevalence like Missouri or Michigan.[5] [6] [7]

Appendix A:

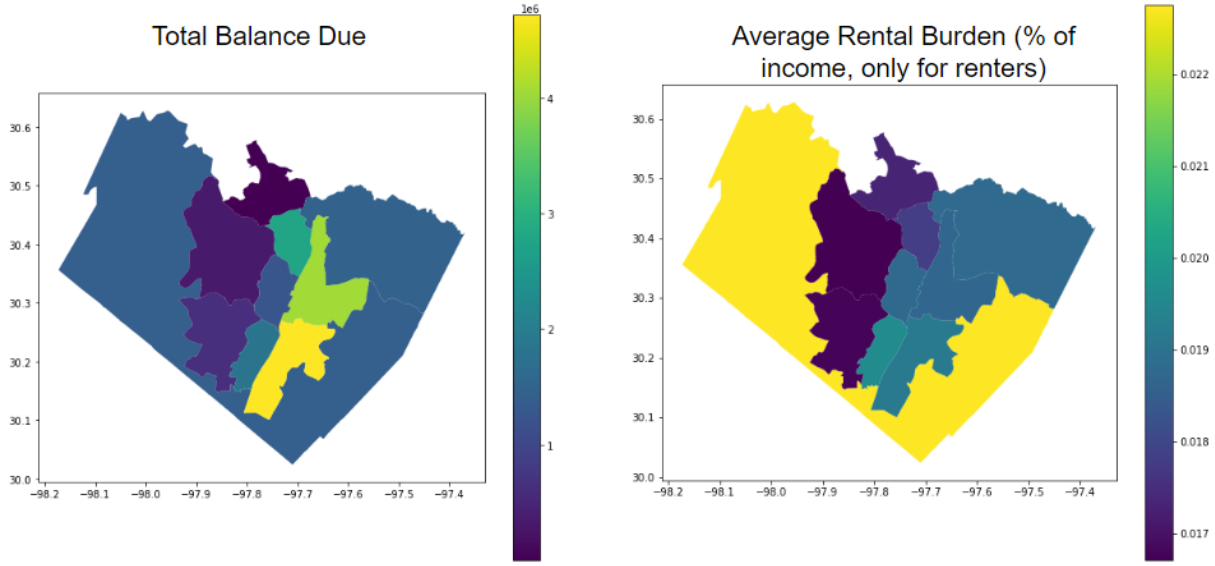


Figure A-1: Total balance due vs average % rental burden for renters, distributed by PUMA (public use microdata area) - R^2: 0.27

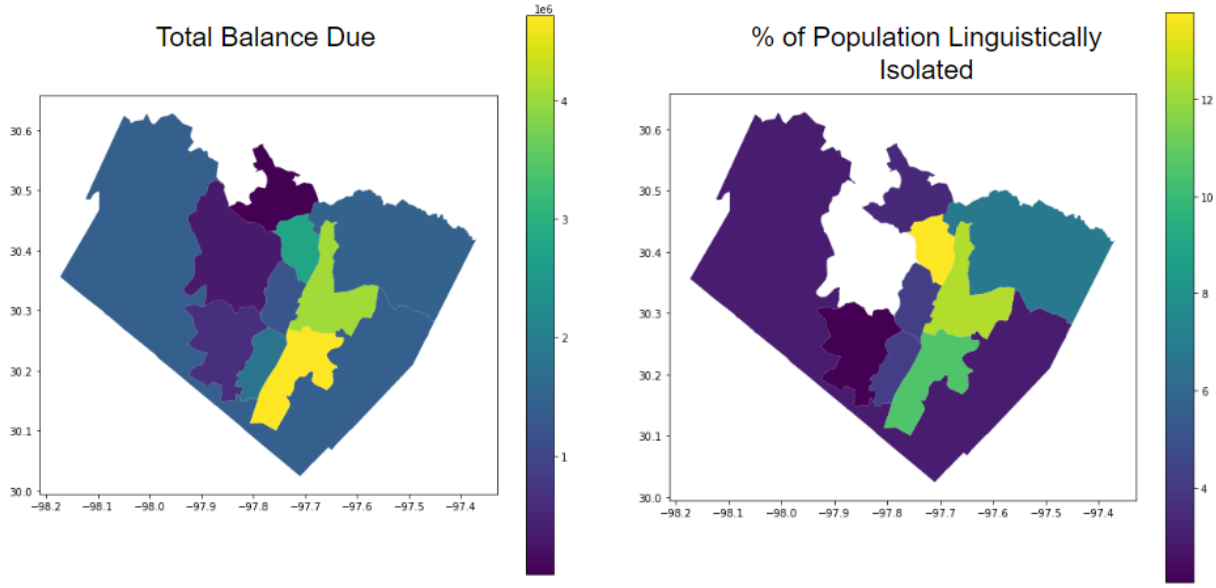


Figure A-2: Total balance due vs % of population linguistically isolated, distributed by PUMA - R^2: 0.85

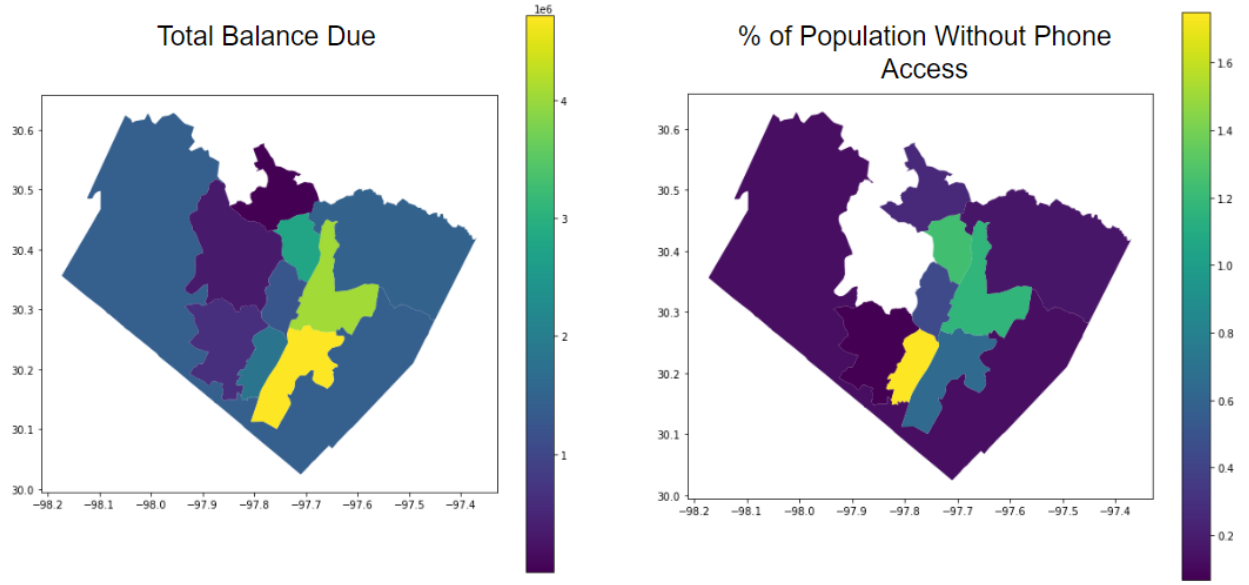


Figure A-3: Total balance due vs % of population without phone access, distributed by PUMA - R^2: 0.48

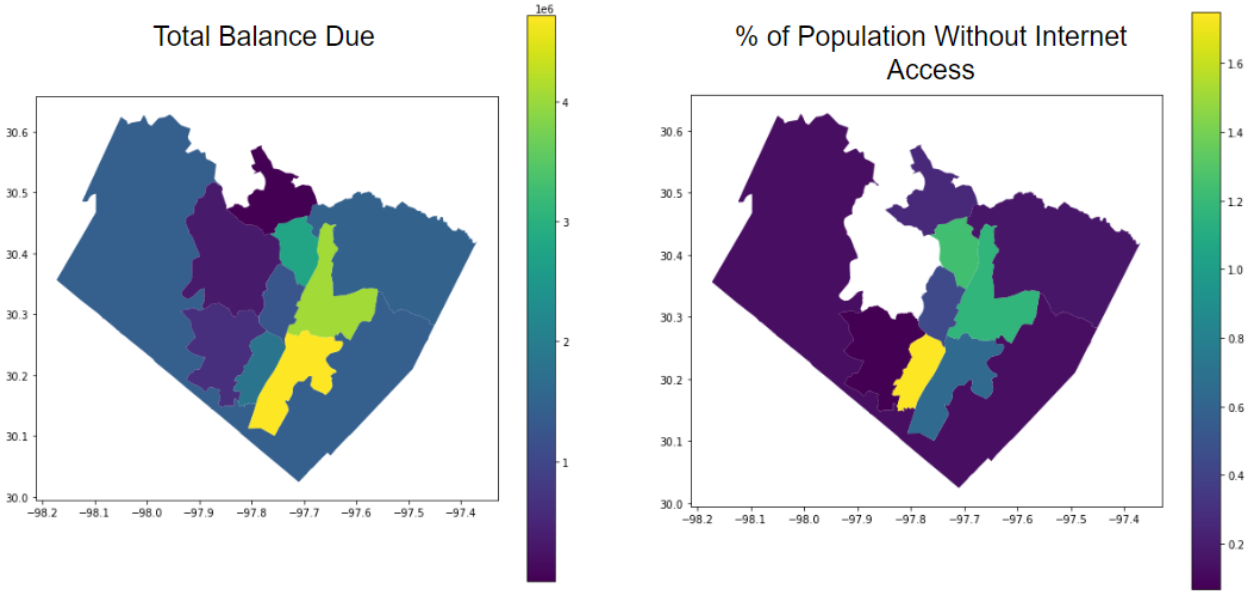


Figure A-4: Total balance due vs % of population without internet access, distributed by PUMA - R^2: 0.88

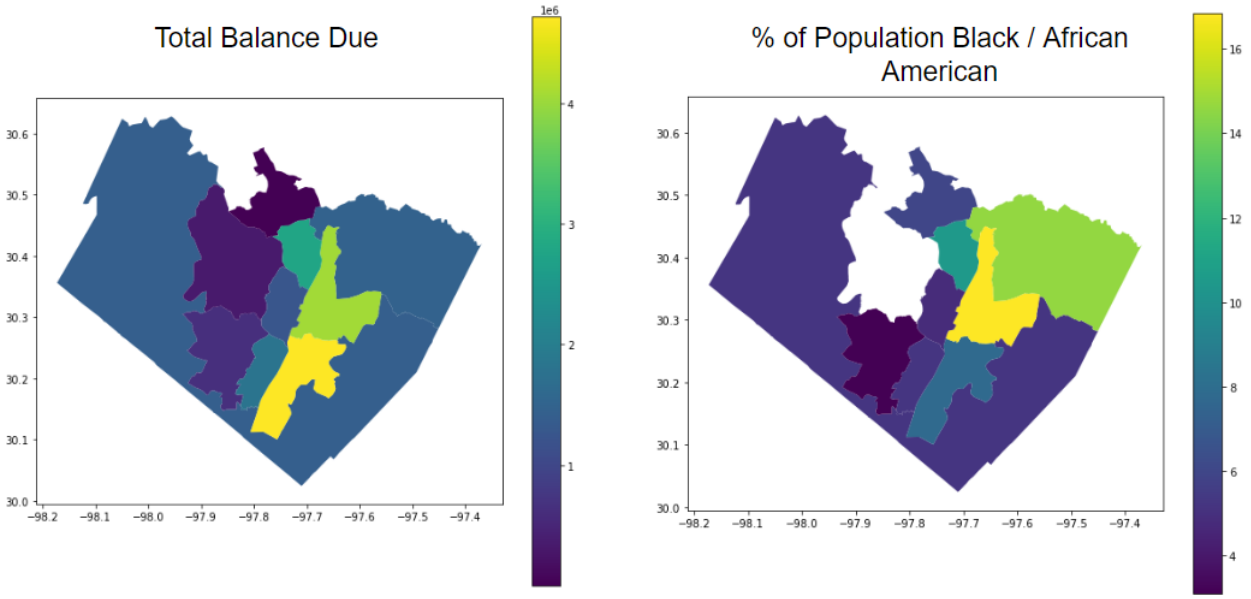


Figure A-5: Total balance due vs % of black population, distributed by PUMA - R^2: 0.57

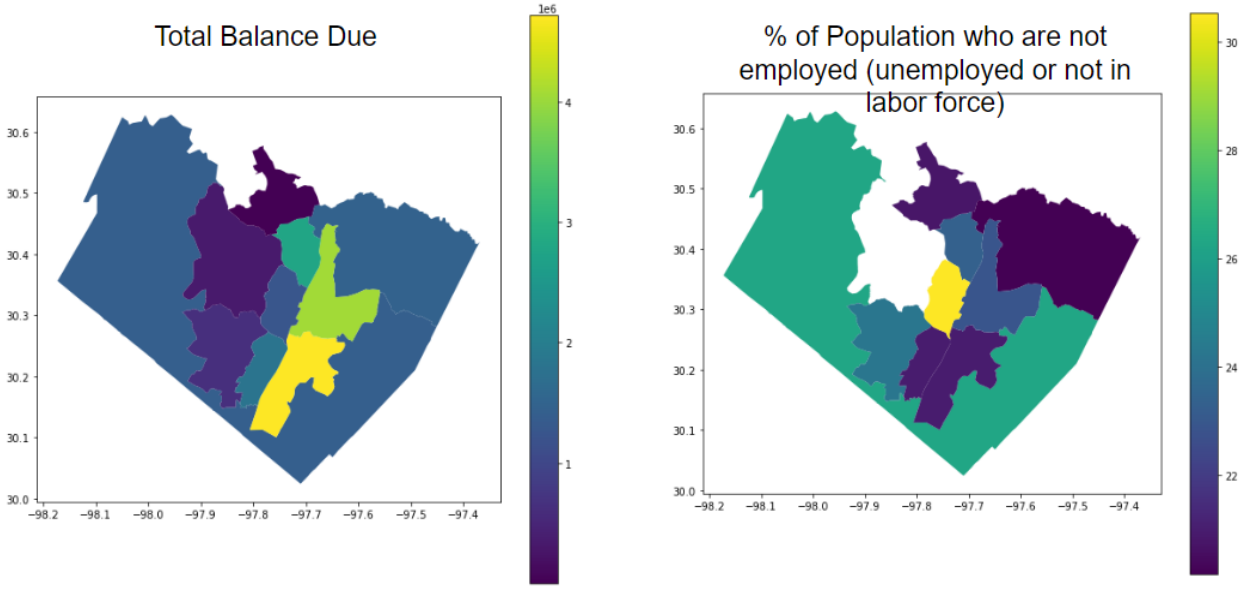


Figure A-6: Total balance due vs % of population who are not employed, distributed by PUMA - R^2: -0.18

References

1. FRANKFURTER, JUSTICE. n.d. “Nardone v. United States, 308 US 338.” Casetext. Accessed March 2, 2022. https://casetext.com/case/nardone-v-united-states.
2. Howe, Amy. n.d. “Utah v. Strieff.” SCOTUSblog. Accessed March 2, 2022. https://www.scotusblog.com/case-files/cases/utah-v-strieff/.
3. Kerr, Orin, and Amy Howe. 2016. “Opinion analysis: The exclusionary rule is weakened but it still lives.” SCOTUSblog. https://www.scotusblog.com/2016/06/opinion-analysis-the-exclusionary-rule-is-weakened-but-it-still-lives/.
4. Sabol, William J. n.d. *Survey of State Criminal History Information Systems, 2014*.
5. “WANTED | Suspects run free while authorities drown in open arrest warrants.” n.d. USA TODAY NETWORK News. Accessed March 2, 2022. https://stories.usatodaynetwork.com/warrants/wanted-suspects-run-free-while-authorities-drown-in-open-arrest-warrants/.
6. 2015. “Investigation of the Ferguson Police Department.” Department of Justice. https://www.justice.gov/sites/default/files/opa/press-releases/attachments/2015/03/04/ferguson_police_department_report.pdf.
7. Slocum, Lee Ann, Luis Torres, and Beth Huebner. n.d. “Warrant Arrests in the City of St. Louis, 2002 – 2019 *.” Data Collaborative for Justice. Accessed March 2, 2022. https://datacollaborativeforjustice.org/wp-content/uploads/2020/12/2020_Warrants_St.Louis_FINAL.pdf.
8. “Austin Police Department Warrant List | AustinTexas.Gov.” Accessed May 9, 2022. https://www.austintexas.gov/police/warrants/warrantsearch.cfm.
9. “Municipal Court Public Inquiry [Main].” Accessed May 9, 2022. https://www.austintexas.gov/AmcPublicInquiry/pubportal.aspx.
10. Chohlas-Wood, Alex, Marissa Gerchick, Sharad Goel, Amy Shoemaker, Ravi Shroff, and Keniel Yao. “Identifying and Measuring Excessive and Discriminatory Policing.” The University of Chicago Law Review, n.d., 35.
11. American Civil Liberties Union. “Texas’ Annual Roundup of the Working Poor.” Accessed May 9, 2022. https://www.aclu.org/blog/smart-justice/texas-annual-roundup-working-poor.
12. “The Sandra Bland Act: Criminal Justice Reform” Accessed May 9, 2022. https://garnetcoleman.com/wp-content/uploads/2020/06/The-Sandra-Bland-Act-Talking-Points-UPDATED.pdf
13. Guy Padula, Utah v. Strieff: Lemonade Stands and Dragnet Policing, 120 W. Va. L. Rev. (2017). Available at: https://researchrepository.wvu.edu/wvlr/vol120/iss2/6
14. Utah v. Strieff, 579 U.S. ___ (2016), https://www.supremecourt.gov/opinions/15pdf/14-1373_83i7.pdf
15. Denning, Shea. “Utah v. Strieff and the Attenuation Doctrine.” *NC Criminal Law Blog | UNC Chapel Hill School of Government* (blog), July 6, 2016. https://nccriminallaw.sog.unc.edu.
16. Goel, Sharad, Justin M. Rao, and Ravi Shroff. “Precinct or Prejudice? Understanding Racial Disparities in New York City’s Stop-and-Frisk Policy.” *The Annals of Applied Statistics* 10, no. 1 (March 1, 2016). https://doi.org/10.1214/15-AOAS897.
17. https://usa.ipums.org/usa
18. Harcourt, Bernard E., and Tracey L. Meares. “Randomization and the Fourth Amendment.” *SSRN Electronic Journal*, 2010. https://doi.org/10.2139/ssrn.1665562.
19. Ferguson, Andrew G. et al. “The "High-Crime Area" Question: Requiring Verifiable and Quantifiable Evidence for Fourth Amendment Reasonable Suspicion Analysis.” American

University Law Review 57, no.6 (October 2008): 1587-1644. https://digitalcommons.wcl.american.edu/aulr/vol57/iss6/2/

20. “ZIP Code™ - The Basics.” Accessed May 9, 2022. https://faq.usps.com/s/article/ZIP-Code-The-Basics.
21. “Working with the ArcGIS World Geocoding Service—ArcMap | Documentation.” Accessed May 9, 2022. https://desktop.arcgis.com/en/arcmap/latest/manage-data/geocoding/working-with-arcgis-online-geocoding-service.htm.