

Final Presentation

The Outliers

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Project Sponsor: ProPublica

- Project began with only a dataset provided by ProPublica
- Prior Work
 - The Ticket Trap:
<https://projects.propublica.org/chicago-tickets/>
 - Duplicate City Sticker Violations:
<https://www.propublica.org/article/chicago-vehicle-stickers-duplicate-tickets-thrown-out>

The Lawsuit

Class Action Suit

Alleges City of Chicago knowingly issued duplicate tickets to generate revenue

- City Sticker Violations
- Expired Registration

12-Person Jury

FILED
11/29/2018 11:55 AM
DOROTHY BROWN
CIRCUIT CLERK
COOK COUNTY, IL
2018CH14812

IN THE CIRCUIT COURT OF COOK COUNTY, ILLINOIS
COUNTY DEPARTMENT, CHANCERY DIVISION

ORLANDO JONES and RODNEY SHELTON,
individually and of behalf of all others similarly
situated,

Plaintiffs,

v.

CITY OF CHICAGO,
a Municipal Corporation,

Defendant.

CLASS ACTION COMPLAINT
2018CH14812
Case No. _____
JURY DEMAND

COMPLAINT

Plaintiffs Orlando Jones and Rodney Shelton ("Plaintiffs"), individually and on behalf of a class of all others similarly situated, complain against Defendant City of Chicago (the "City" or "Defendant") as follows:

INTRODUCTION

I. All Chicago residents operating a vehicle in the City of Chicago are subject to the Chicago Wheel Tax and must purchase and display a Chicago City Vehicle Sticker. Depending on the type of vehicle, the City's vehicle stickers can cost up to several hundreds of dollars every year. Failure to purchase and display a City sticker can result in hefty fines and penalties.

FILED DATE: 11/29/2018 11:55 AM 2018CH14812

MCC § 3-56-150(b)

4. To make matters worse the City has also engaged in an illegal practice of issuing duplicative City sticker tickets – *i.e.*, issuing two or more City sticker tickets to the same vehicle on the same day, a practice specifically prohibited under the Municipal Code of Chicago (“MCC”). *See* MCC § 3-56-150(b) (“A separate and distinct offense shall be considered as committed for *each and every day* any vehicle is used upon the public ways of the city ... without having complied with the provisions of this chapter.”) (emphasis added).

Problem Statement

"To gather information and investigate the practices of the City of Chicago regarding the issuing of duplicate tickets, especially those issued for expired registrations"



Why is this issue important?



\$37,198,820

Total excess fines issued by the City of Chicago



643,446

Repeat tickets issued since 1996

\$28,288,495

Total excess paid on repeat tickets

\$5,634,383

Total excess paid on expired registration tickets

Define Duplicate

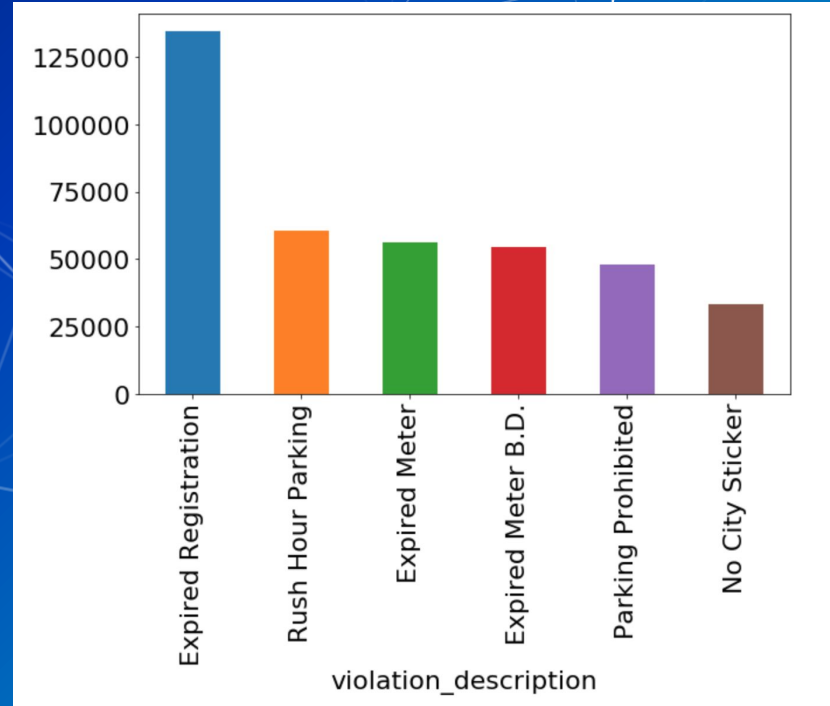
Same License Plate + Same Day + Same Violation

Duplicate Dataset

- Contains every duplicate ticket from original dataset
- Added feature to uniquely identify duplicate groups
- Added feature to identify first and repeat tickets within each group

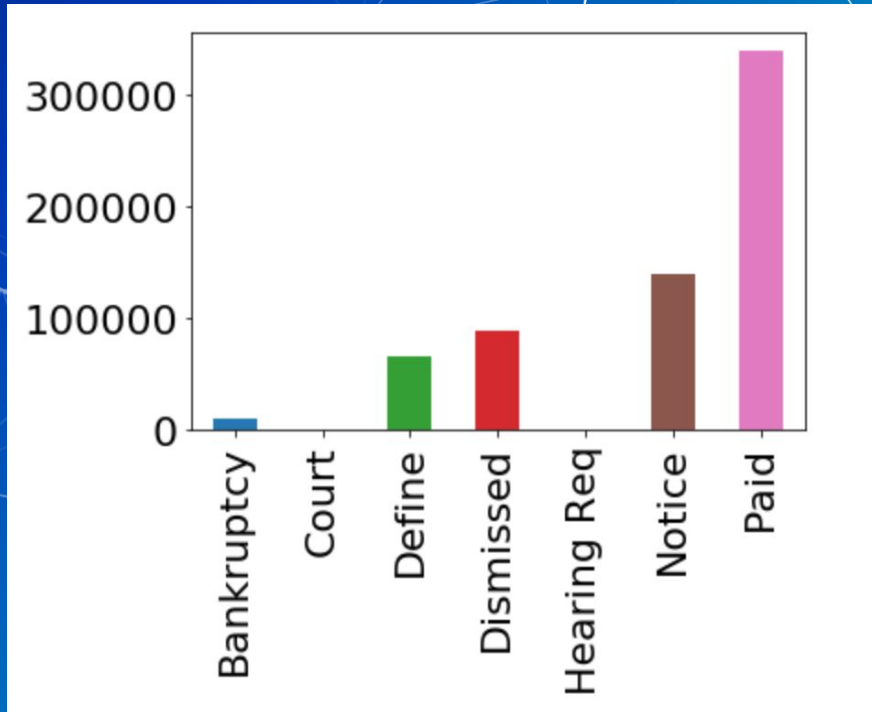
Repeat Frequency by Violation

More than 4 times as many repeat tickets for expired registration compared to city sticker violations



Outcomes of Repeat Tickets

Only 13.9 percent of repeat tickets have been dismissed



Malicious Ticketing

- Officer 287 is an example of fraudulently ticketing a vehicle numerous times, for the same violation, within minutes of having issued the first
- Potential Reasoning:
 - Fulfil ticket quota?
 - Automated ticketing system using 287 as ID?

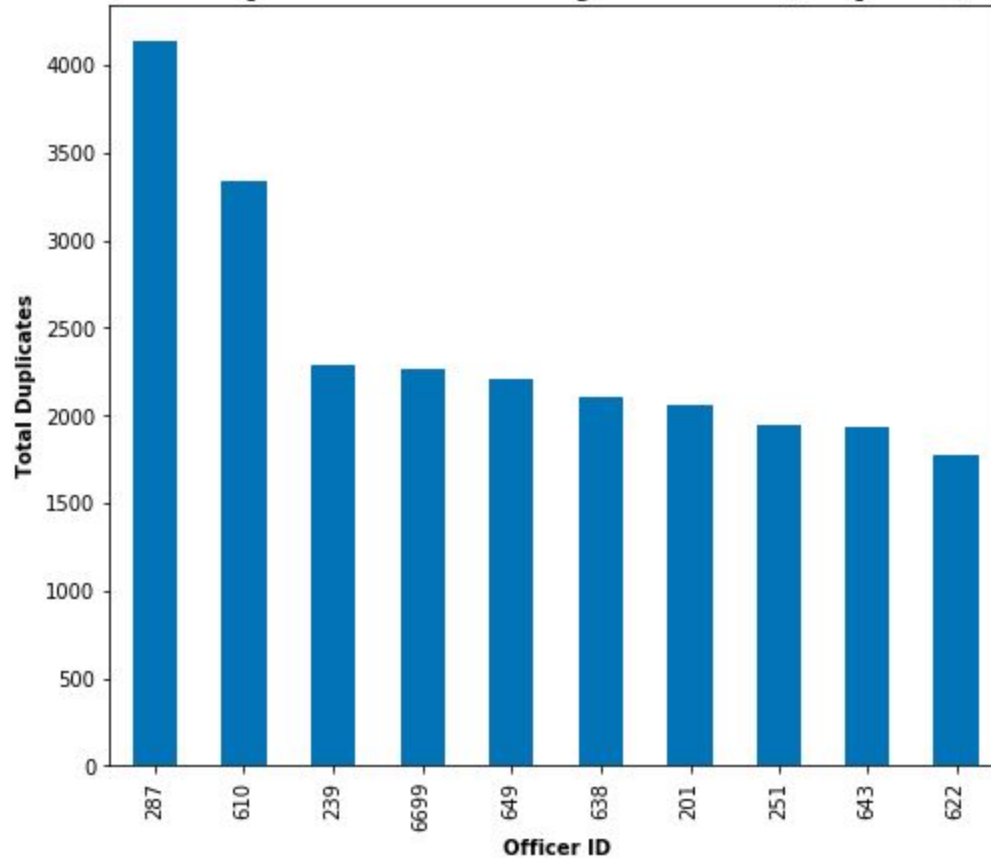
ticket_number	issue_date	violation_location	license_plate_number
9054011304	2004-02-26 09:18:00	1612 W CHICAGO AVE	fb0592ef7ccba3f0bc67e426a4e5bd9c3300b7b9495f4c...
9054011305	2004-02-26 09:20:00	1612 W CHICAGO AVE	fb0592ef7ccba3f0bc67e426a4e5bd9c3300b7b9495f4c...
9054011306	2004-02-26 09:21:00	1612 W CHICAGO AVE	fb0592ef7ccba3f0bc67e426a4e5bd9c3300b7b9495f4c...

violation_description	unit	unit_description	vehicle_make	fine_level1_amount	fine_level2_amount	current_amount_due	total_payments	ticket_c
PARKING/STANDING PROHIBITED ANYTIME	498	DOF	TOYT	50	100	0	100.0	Paid
PARKING/STANDING PROHIBITED ANYTIME	498	DOF	TOYT	50	100	0	100.0	Paid
PARKING/STANDING PROHIBITED ANYTIME	498	DOF	TOYT	50	100	0	100.0	Paid

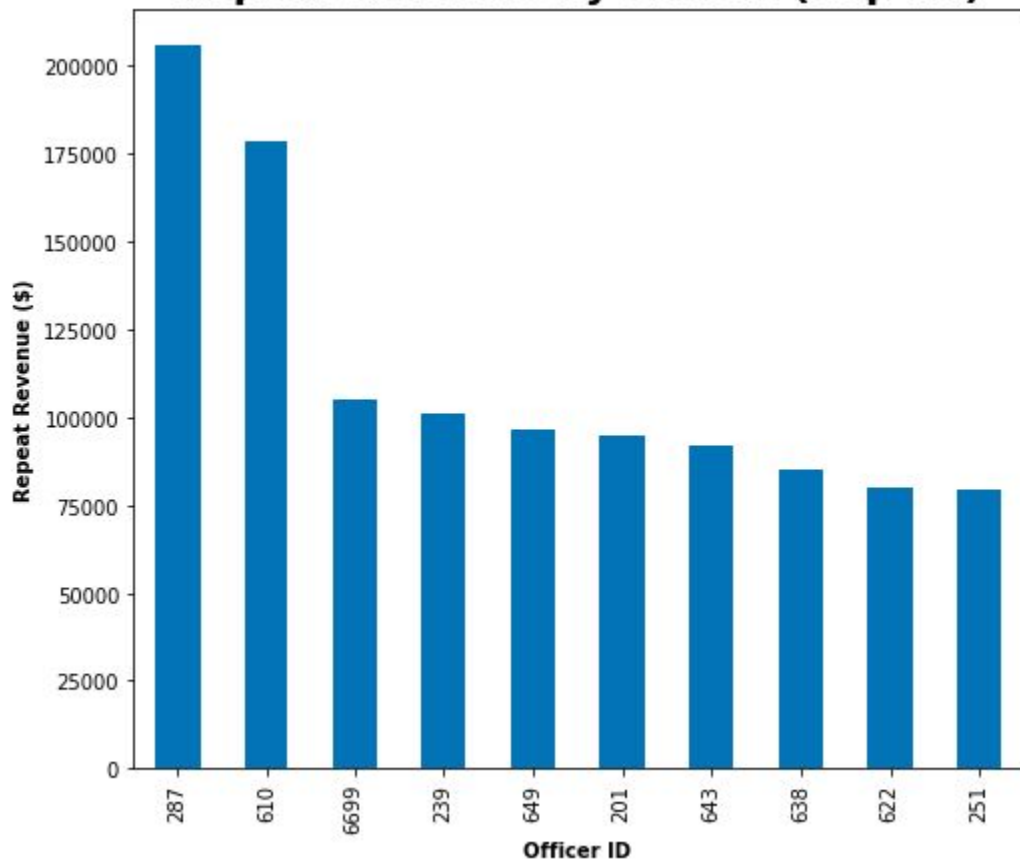
ticket_number	issue_date	violation_location	license_plate_number
9057301520	2006-09-06 11:49:00	2418 W CORTLAND	ef92f995dc9e5e700b825c00eb5a8cc438d6f76b8a1988...
9057301521	2006-09-06 11:50:00	2418 W CORTLAND	ef92f995dc9e5e700b825c00eb5a8cc438d6f76b8a1988...
9057301522	2006-09-06 11:51:00	2418 W CORTLAND	ef92f995dc9e5e700b825c00eb5a8cc438d6f76b8a1988...

violation_description	unit	unit_description	vehicle_make	fine_level1_amount	fine_level2_amount	current_amount_due	total_payments	ticket_
RESIDENTIAL PERMIT PARKING	498	DOF	PLYM	50	100	0	100.0	Paid
RESIDENTIAL PERMIT PARKING	498	DOF	PLYM	50	100	0	100.0	Paid
RESIDENTIAL PERMIT PARKING	498	DOF	PLYM	50	100	0	100.0	Paid

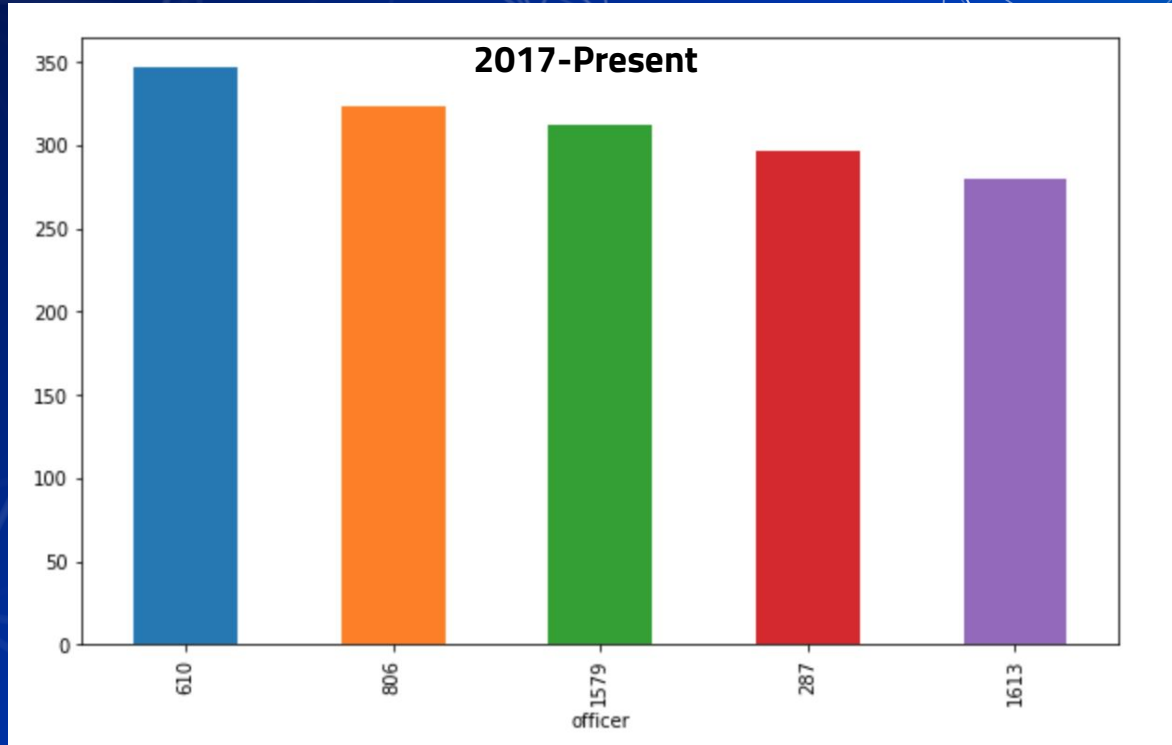
Repeats Issued by Officer (Top 10)



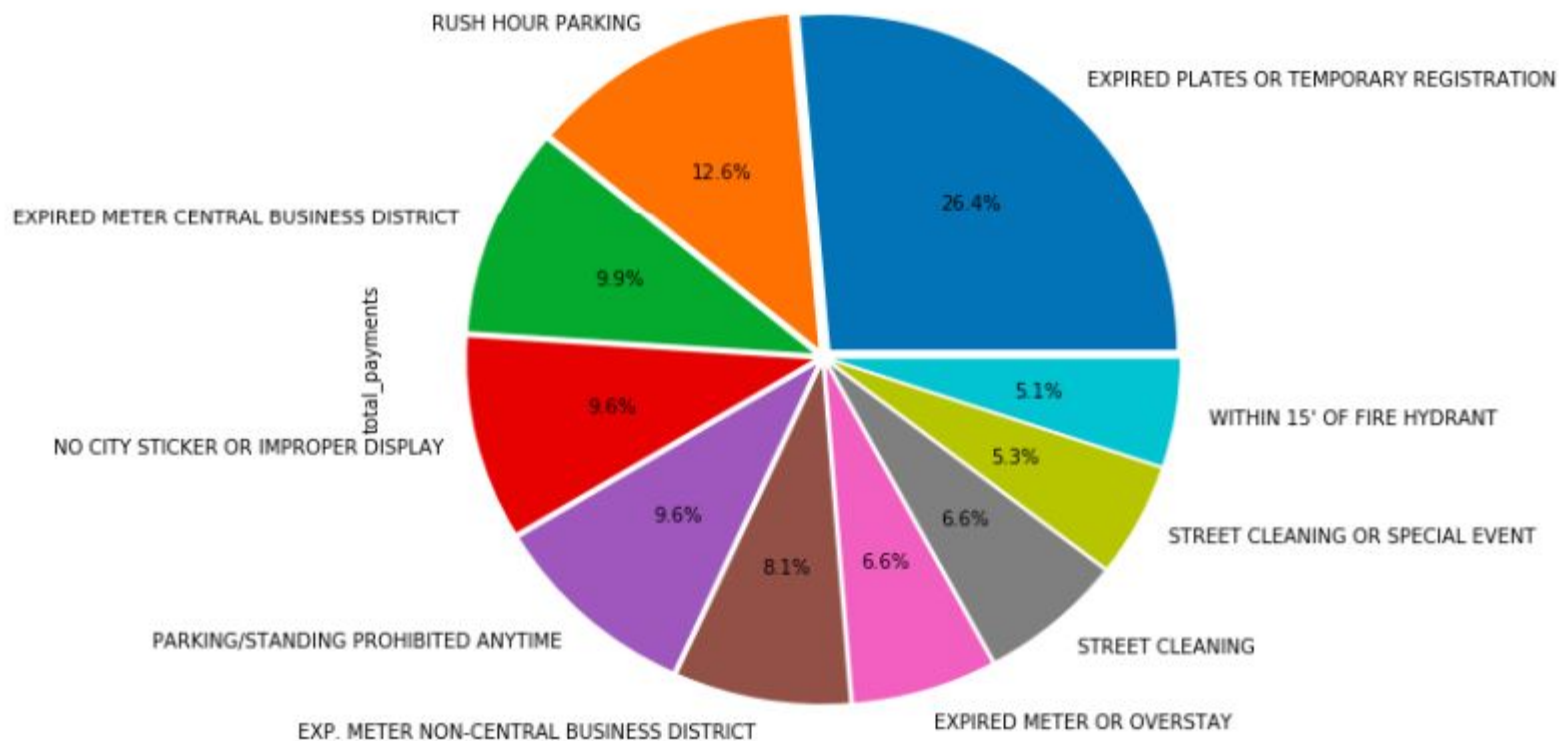
Repeat Revenue by Officer (Top 10)



Are Repeats Still a Problem?



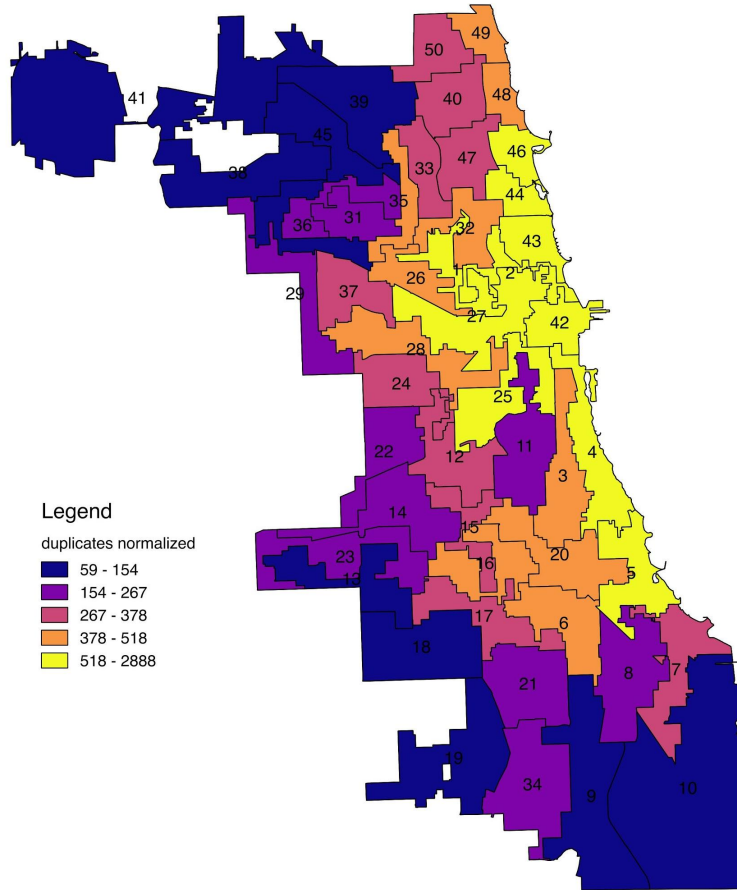
Repeat Revenue by Ticket Type



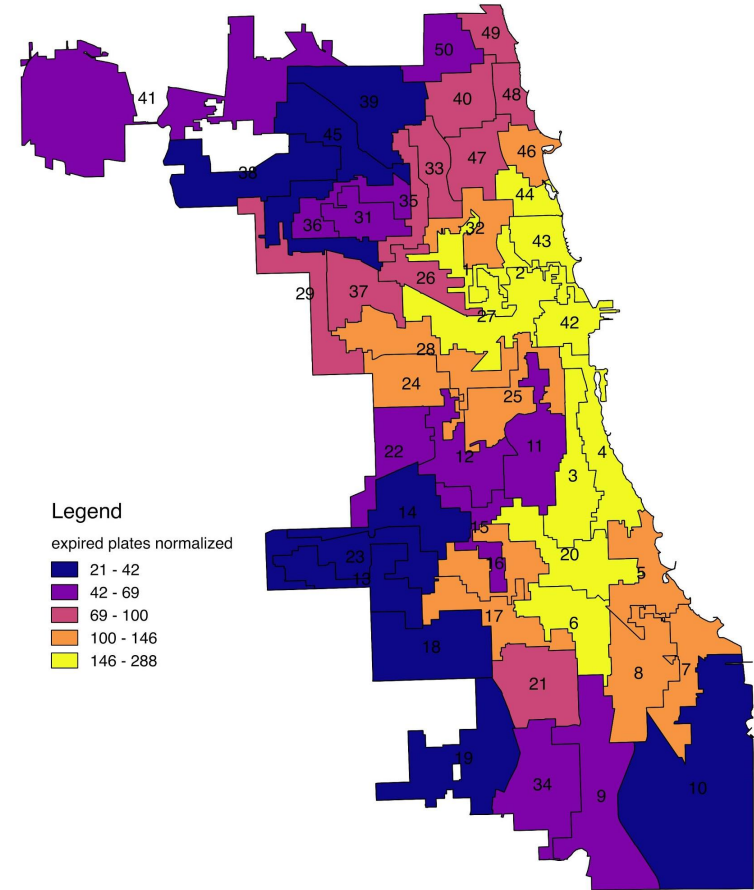
Where in the city?

- Where are all of the duplicates?
- Where are all of the expired plate duplicates?

Heatmap of Duplicate Tickets by Ward



Heatmap of Duplicate Expired Plate Tickets



What Affects Tickets?

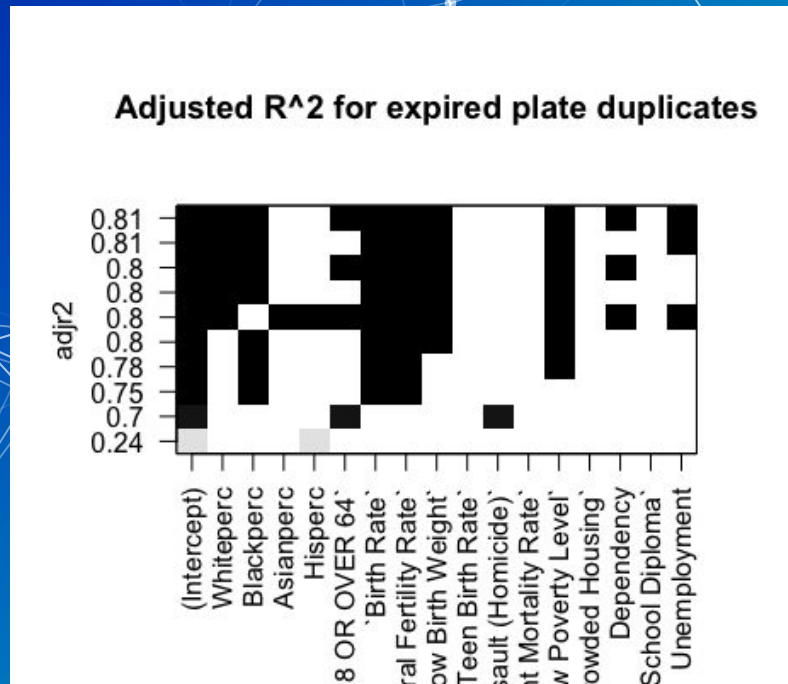
- Used multiple linear regression to find factors that influence tickets and different kinds of tickets.
- Allows us to see statistical significance of the attributes by looking at their p-values.

Data used

- Put together health data, demographic data, and socioeconomic data.
- Had to convert to ward levels
- Many unnecessary factors removed.
- Final factors:
 - Race percentages, unemployment, per capita income, birth rates, assault, and poverty

Modeling for Expired Plates

- Focused more on smaller models
- Tried many different combinations and found p-values for significance.
- R^2 not super important



Modeling Results

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)	
(Intercept)	0.2437382	0.0232261	10.494	1.12e-13	***
Blackperc	0.0851313	0.0153461	5.547	1.46e-06	***
`PERCENT AGED UNDER 18 OR OVER 64`	-0.0065964	0.0006570	-10.040	4.58e-13	***
`Below Poverty Level`	0.0020631	0.0007121	2.897	0.00579	**

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.02618 on 45 degrees of freedom

Multiple R-squared: 0.7487, Adjusted R-squared: 0.732

F-statistic: 44.7 on 3 and 45 DF, p-value: 1.511e-13

Is Race an Issue?

- Propublica's EDA suggests that communities of certain races receive different treatment as far as tickets.
- Can we find statistical evidence of this?

Yes, Race only modeling

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)	
Blackperc	0.12663	0.01349	9.387	3.63e-12	***
Whiteperc	0.10943	0.02236	4.894	1.31e-05	***
Asianperc	0.10014	0.10587	0.946	0.349	
Hisperc	0.02793	0.01859	1.502	0.140	

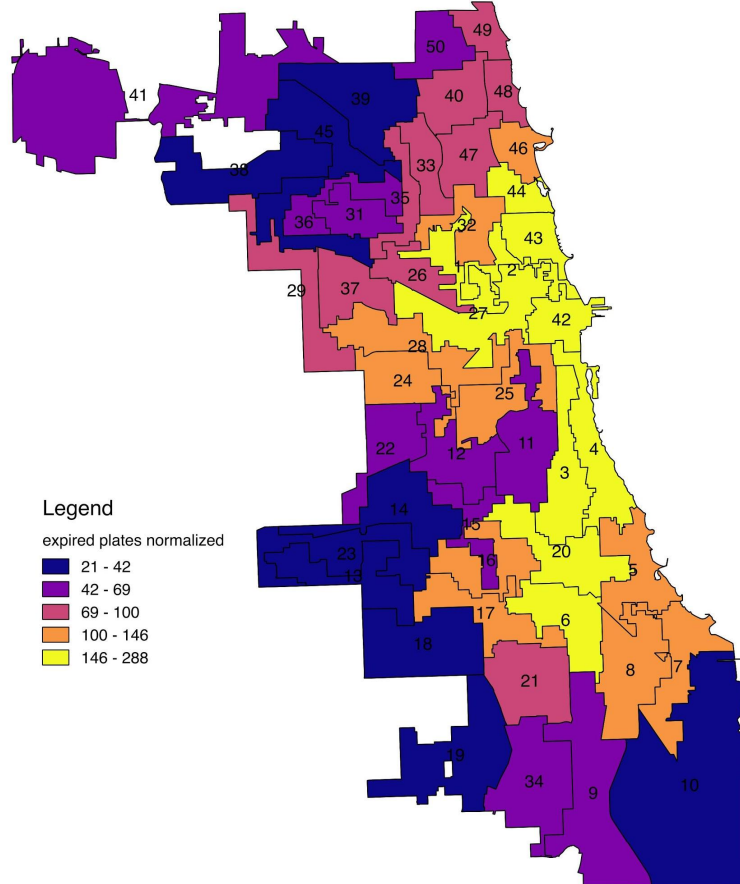
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.0449 on 45 degrees of freedom

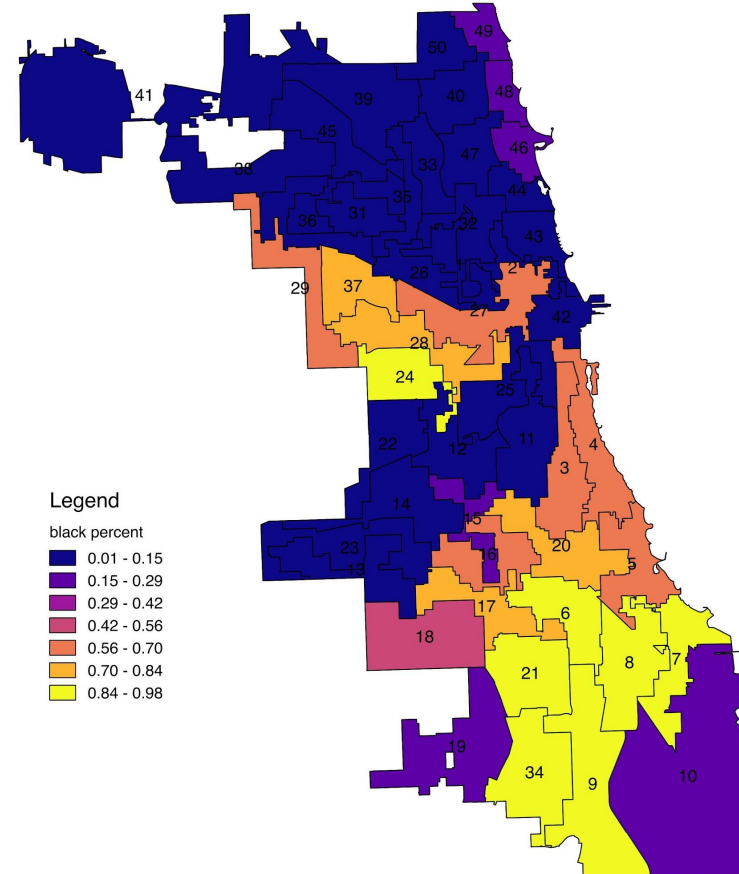
Multiple R-squared: 0.8227, Adjusted R-squared: 0.8069

F-statistic: 52.2 on 4 and 45 DF, p-value: 2.437e-16

Heatmap of Duplicate Expired Plate Tickets



Heatmap of Percentage of Black Residents



Summary

- We hopefully added to Melissa Sanchez's study for the duplicate expired plates tickets.
- We have created a dataset of all duplicate tickets.
- Shown that there is malicious ticketing by individuals
- Used Statistical evidence to show what factors may influence tickets in a ward.
- Used Statistical evidence to show that communities with different race makeup are ticketed differently.

Suggested Future Work

- Continue to use the duplicate dataset and look into different ticket types
- Find ticketing patterns of ticketing officers
- Continue modeling, normalize by households rather than population.
- Model on community level rather than ward level, possibly even block or census tract level.

**Thank you,
Questions?**