

# I Fought the Law:

## Contesting Charges in Virginia's District Courts

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Ask the Internet if You Should Contest That Ticket...

## **6 REASONS A LAWYER SHOULD FIGHT YOUR TICKET**

**Top Seven Reasons to Hire an Attorney for a  
Misdemeanor**

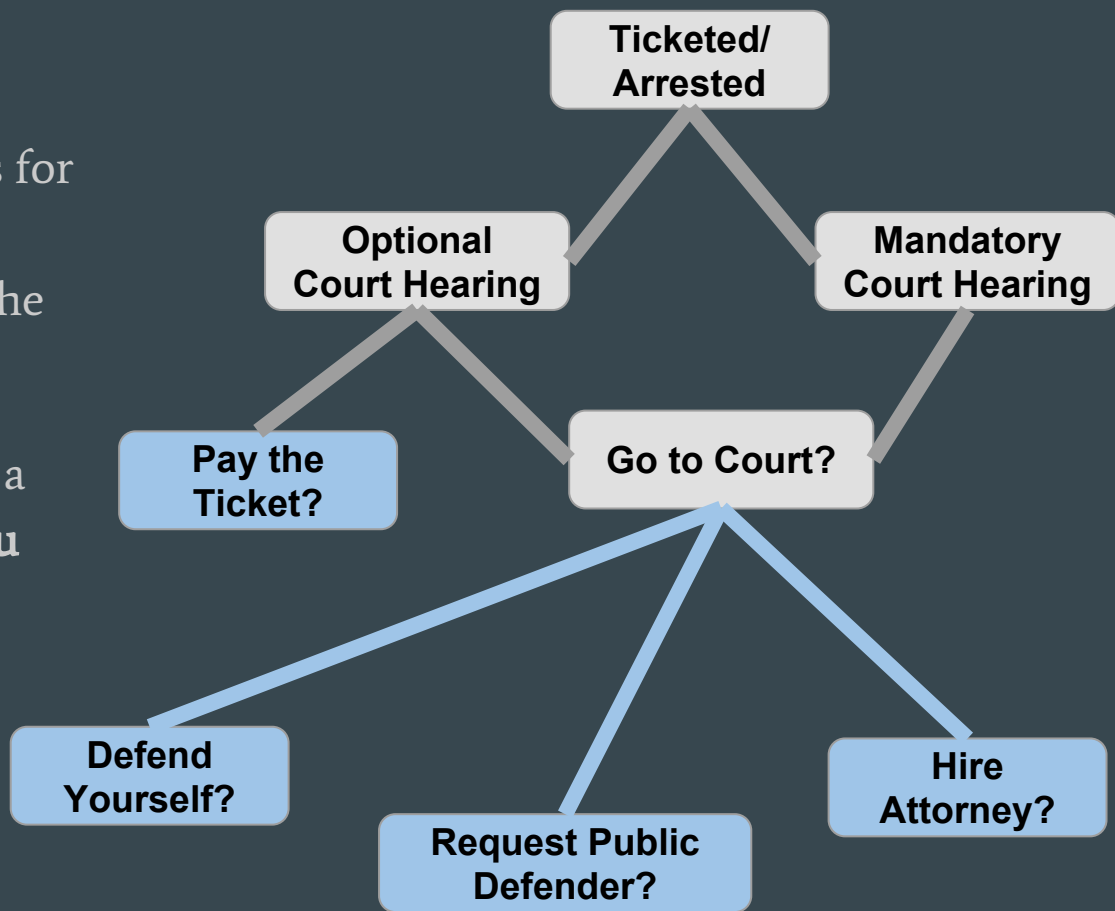
**THREE REASONS WHY YOU SHOULD HIRE A LAWYER FOR YOUR  
SPEEDING TICKET**

THERE ARE NO SMALL CASES! Hire a lawyer for that misdemeanor charge and go to trial!

# Problem Statement

Given historical data on caseloads for Virginia's Traffic and Criminal Courts, how well can we predict the outcome of a case?

If you're ticketed or charged with a crime in Virginia, **what should you do?**



# Data Collection

## Part 1: Web Scraping...

- Scraper using Selenium and BeautifulSoup
- After one week, I had 62k cases

## Part 2: Researching...

- Ben Schoenfeld has scraped all Virginia Court Cases from 2010-2017!
- In a few minutes, I had 2.1m cases

# Cleaning & Feature Engineering

What do we need to measure to answer the question?

## “Positive” Outcomes for the Defense:

- Not Guilty
- Dismissed
- Nolle Prosequi
- Not Guilty Due to Insanity
- Amended Charge

## Type of Defense:

- Hired Private Lawyer
- Requested Public Defender
- Defended self / no information

## Filter on Contested Charges

- All charges not “Guilty in Absentia” or “Prepaid”

# NLP/Topic Modeling to Cluster Charges

66k+ unique charges / 5.5k+ unique codes → 59 charge categories:

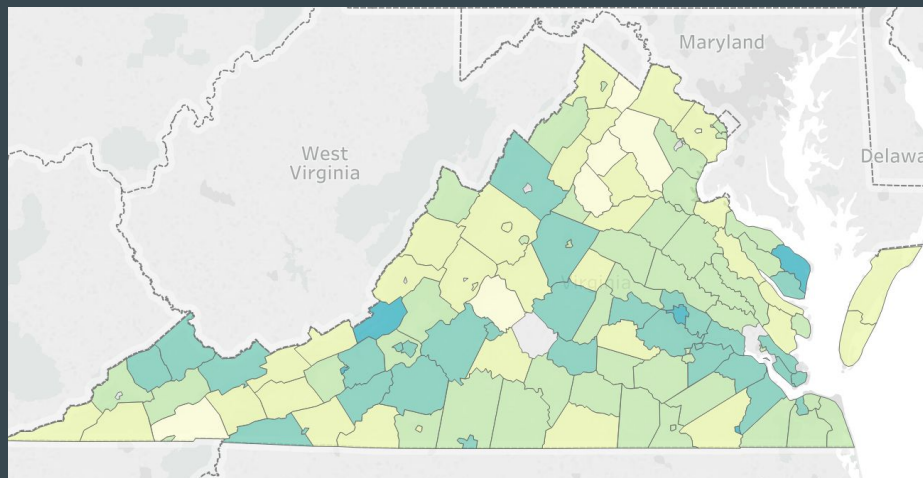
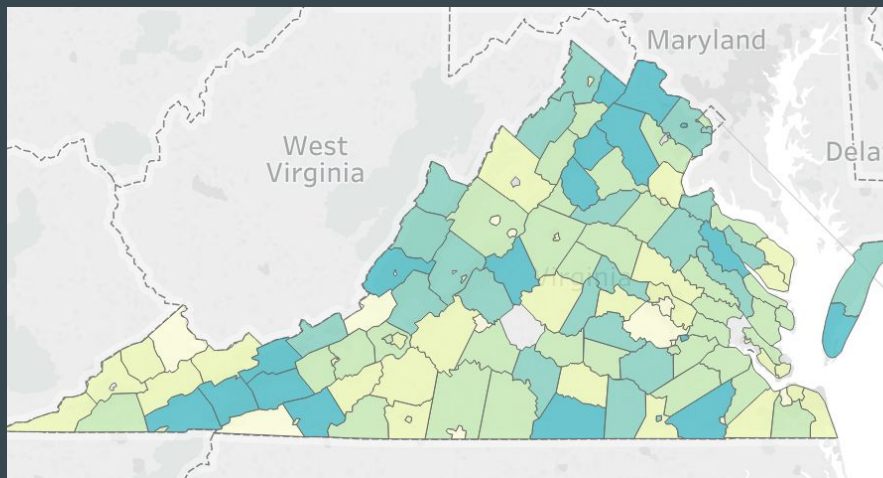
- 5 Civil Violations
- 14 Infractions
- 22 Misdemeanors
- 18 Felonies



# Summary Stats

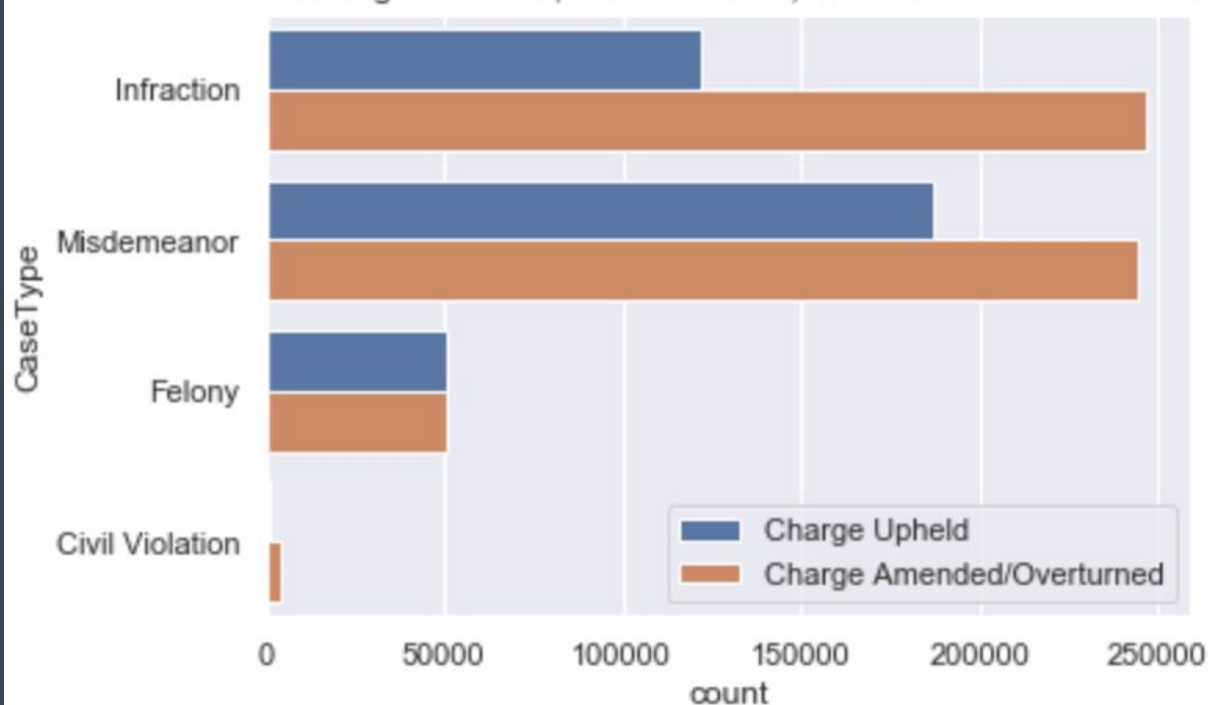
- 1.9 million scheduled hearings in Virginia in 2017 across 134 District Courts
- \$120m in fines assessed & \$112m in court costs recorded (for charges upheld)

*Where Charges Are Contested (Darker Blue)*    *Where Defenses Are Won (Darker Blue)*



# Which Charges Are Easiest to Beat?

Contesting Infractions, Misdemeanors, Civil Violations and Felonies



## Top Charges Dismissed/ Acquitted in Each Category:

VIOL: Refused Blood/  
Breathalyzer Test (81%)

INF: Expired registration /  
inspection (80%)

MIS: Assault (74%)

FEL: Forgery, Fraud, Extortion,  
Credit Card & Identity Theft  
(49%)



# Building a Classification Model

Baseline: **59%** of contested cases had positive outcomes for the defense

True Negatives: 40353

False Positives: 58567

False Negatives: 25736

True Positives: 118317

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Sensitivity/Recall (True Positive Rate): 0.82

Specificity (True Negative Rate): 0.41

False Positive Rate: 0.41

**Precision: 0.67**

*Accuracy Scores:*

Logistic Regression:

**Train:** 65.3%

**Test:** **65.1%**

Decision Tree Classifier:

**Train:** 63.9%

**Test:** **65.1%**

Random Forest Classifier:

**Train:** 65.1%

**Test:** **65.1%**

# Most Important Features/Coefficients

Improve Your Odds:

	logreg_coefficient	change_odds_ratio
HadLawyer	0.219310	1.245218
ChargeType_MIS: Speeding	0.246678	1.279766
ChargeType_INF: License/Permit/Tag Issues	0.251494	1.285945
ChargeType_INF: Speeding	0.365368	1.441044
ChargeType_INF: Expired Registration/Inspection	0.478889	1.614279

Hurt Your Odds:

	logreg_coefficient	change_odds_ratio
Race_Black(Non-Hispanic)	-0.307408	0.735351
Race_White Caucasian(Non-Hispanic)	-0.214126	0.807247
Race_Hispanic	-0.192787	0.824657
ChargeType_MIS: DWI/DUI	-0.129296	0.878714
ChargeType_INF: Seatbelt	-0.122549	0.884662

# Outcomes Are Not Equal Across Race/Ethnicity

ANOVA tests on speeding tickets contested in Fairfax, Henrico, Virginia Beach, Augusta counties all showed p-values small enough to reject the null hypothesis of even average outcomes for White, Black, and Latino defendants at a significance level of  $\alpha=0.01$  (but not small enough in rural Henry or Wythe Counties)

	Race/Ethnicity	2017 Census Percentage	2017 Criminal Hearing Percentage
0	White Caucasian (Non-Hispanic)	62%	60%
1	Black (Non-Hispanic)	20%	32%
2	Hispanic	9%	3%
3	Asian Or Pacific Islander	7%	2%
4	American Indian	.05%	.02%
5	Other(Includes Not Applicable, Unknown)	1.5%	2.7%

# Type of Defense Matters...Some of the Time

I looked at ANOVA tests to compare outcomes in Fairfax and Newport News for certain charges and defense strategies.

## **For misdemeanor drug offenses:**

- in Fairfax County, public defenders are just as effective as private lawyers
- in Newport News, outcomes are statistically different for defendants with public defenders vs. private lawyers.

## **For misdemeanor reckless driving charges:**

- in Fairfax, it makes a difference whether you defend yourself, hire a lawyer, or have a public defender.
- in Newport News, p-values are not small enough to reject the null hypothesis that average outcomes for these types of defenses are the same

# Next Steps

So, if you are ticketed, arrested, or charged with a crime in Virginia, what should you do? To better answer this question, I could...

1. Build a more complex statewide model by researching/engineering more features for the classification model, or
2. Building smaller, more focused models at the county/district level or based on types of charges