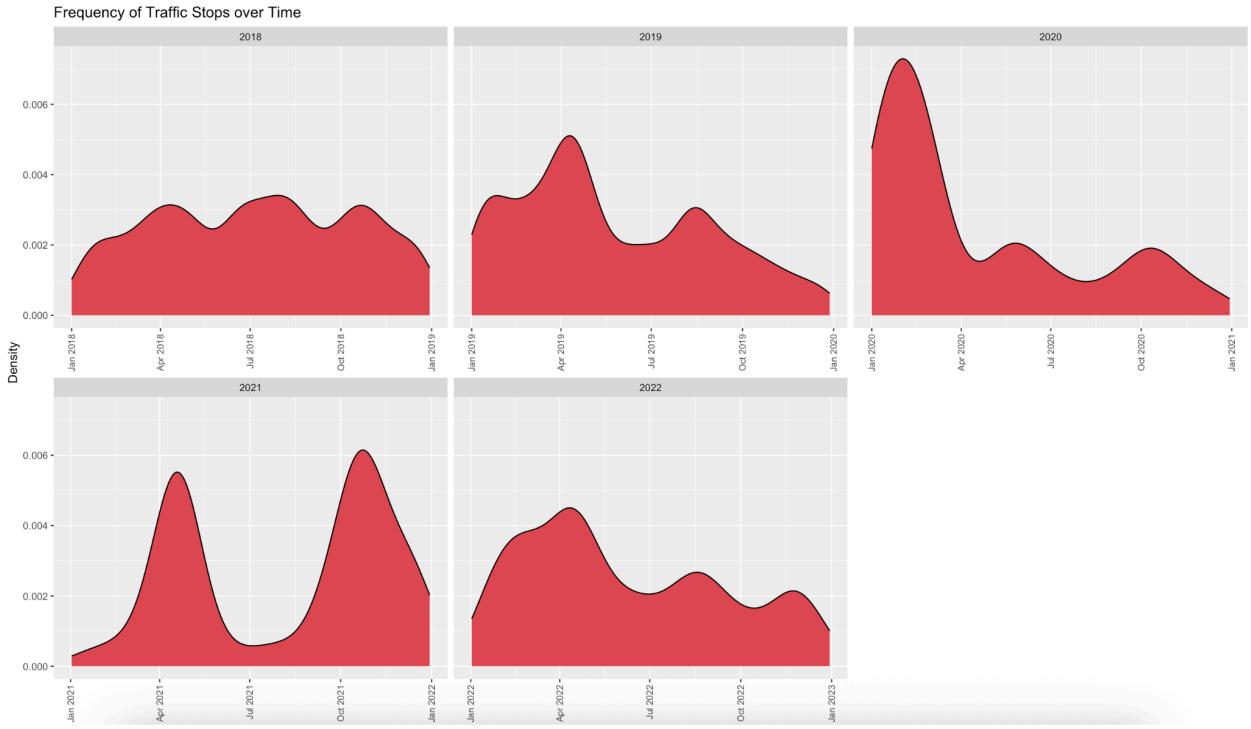
Will Drake

Introduction.

Traffic stops represent one of the most frequent points of contact between law enforcement and the public, making their patterns essential for evaluating both community safety and equitable policing. This analysis examines every recorded traffic stop in Middletown, Connecticut, including the area surrounding Wesleyan University, from January 2018 through December 2022. Spanning five years, I capture pre-pandemic "baseline" behavior and the abrupt disruptions of COVID-19.

Through these visualizations I describe temporal trends in stop volume, assess demographic and officer-level patterns against town composition, and explore how reasons for stops translate into outcomes. Building off of government data, I ask:
Who gets stopped? Why are they stopped? And what happens afterward?

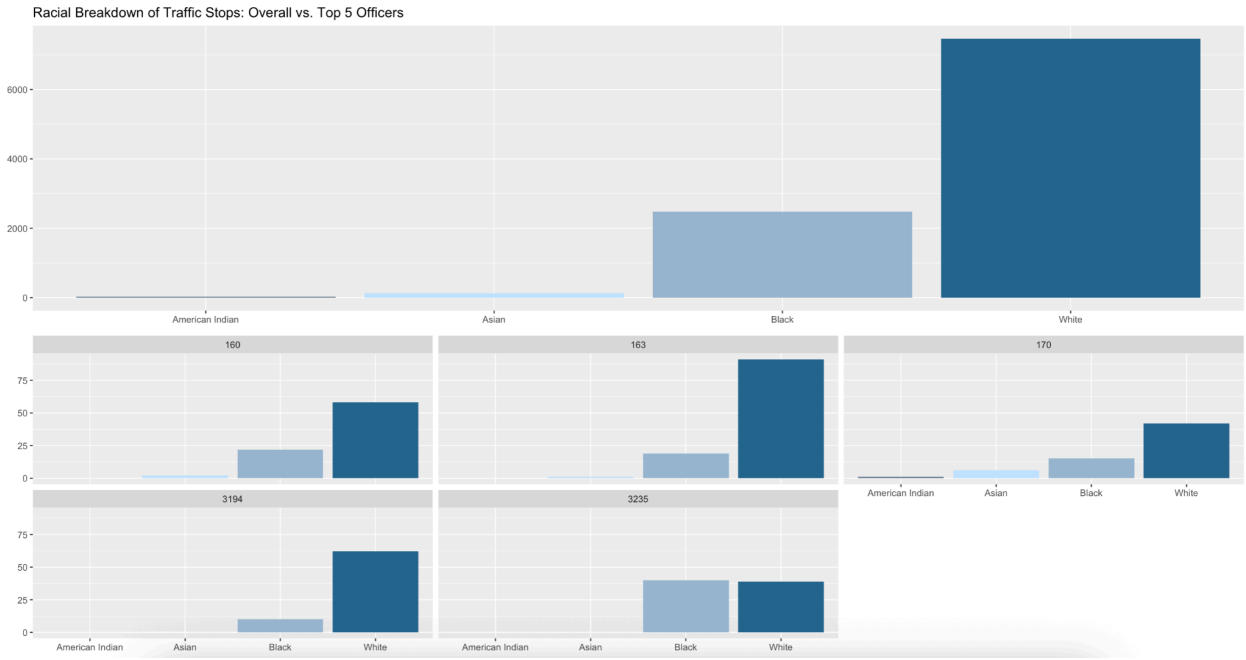
Visualization I.



The first visualization plots the total number of monthly traffic stops from January 2018 to December 2022. During 2018-2019, stop volumes fluctuate modestly around a stable baseline. In early 2020, however, there was a pronounced spike, immediately followed by a steep decline between March and April as Connecticut's stay-at-home orders took effect. From mid-2020

through April 2021, monthly stops remained suppressed, much below pre-pandemic averages, before surging again in April and October 2021. By 2022, stop counts had reverted mainly to the levels seen in 2018 and 2019. These dynamics suggest that both driver behavior and departmental directives underwent significant, pandemic-driven shifts, with effects persisting well into 2021.

Visualization II.



To evaluate whether enforcement aligns with Middletown's demographics (64.7 percent White, 13.3 percent Black, 5.3 percent Asian, and 16.7 percent Multiracial/Other), the second visualization compares the racial breakdown of all stopped drivers and to each of the five officers who conducted the most stops over the 5 years. Aggregate stop frequencies mirror community demographics: White drivers are stopped most often, followed by Black, then lower amounts of Asian and Indian American drivers. Four of the top five officers reflect this pattern; however, Officer 3235 stands out by stopping Black drivers at a disproportionately higher rate.

This anomaly raises questions about individual discretion versus patrol-area effects. It suggests the need for statistical tests, such as chi-square analyses or logistic regression controlling for location, to determine whether bias contributes to this pattern.

Visualization III.

The third visualization employs a river plot to map how over fifteen specific stop reasons flow into four outcomes: No Action, Warning Verbal or Written, Ticket, and Court Summons or Arrest. To maintain clarity, reasons were grouped into six categories: Moving & Traffic (e.g., speed-related, moving violations, and stop-sign violations), Safety & Distraction (e.g., cell-phone and seat belt infractions), License & Registration (e.g., unlicensed operation and registration issues), Equipment & Inspection (e.g., defective lights, window tint, display of plates, equipment violations, and STC violations), Administrative (administrative offenses), and Other.

Contrary to expectations that simple citations such as a ticket or warning would dominate, the court summons or arrest category emerges as the most frequent outcome, specifically the court summoning (for a misdemeanor) portion; tickets and no action constitute a minority. Equipment and inspection stops are the largest single category, predominantly leading to a summons or arrest, while the other category, likely encompassing more serious infractions, results in a summons or arrest over half the time. These findings indicate that many non-safety stops escalate beyond warnings or citations.

Visualization IV.

Dashboard

Choose a Factor:

Age Group

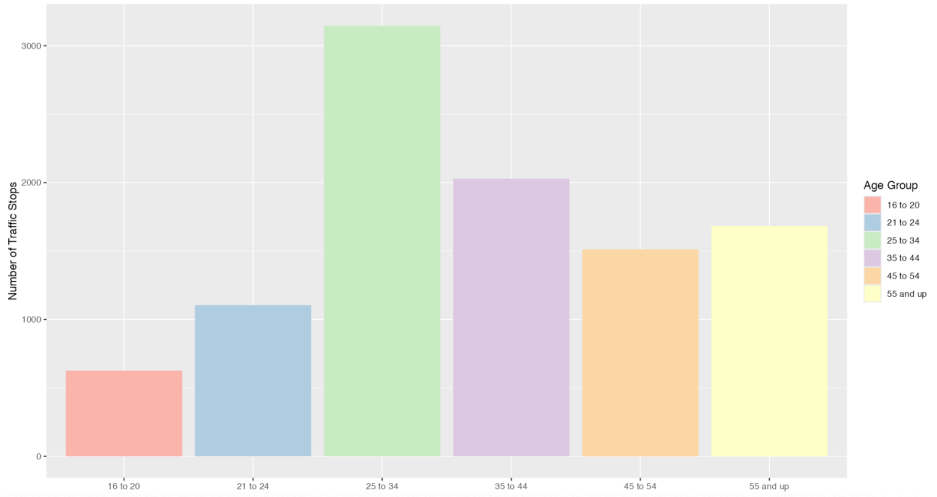
Choose a Year Range:

2018 2022

2018 2019 2020 2021 2022

Demographic

Demographic Stops | Outcomes Proportionally



Dashboard

Choose a Factor:

Sex

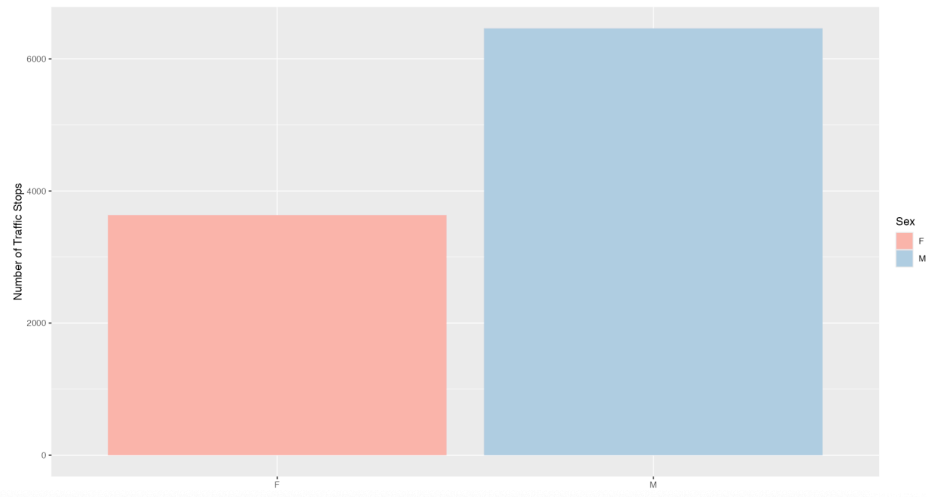
Choose a Year Range:

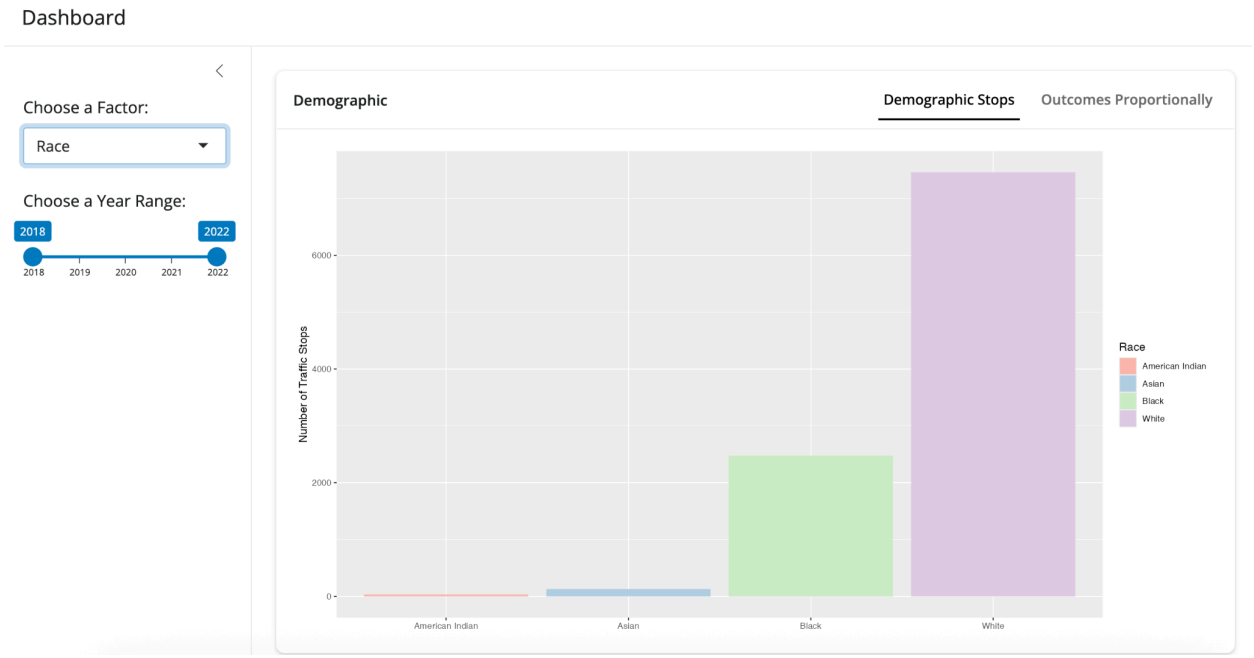
2018 2022

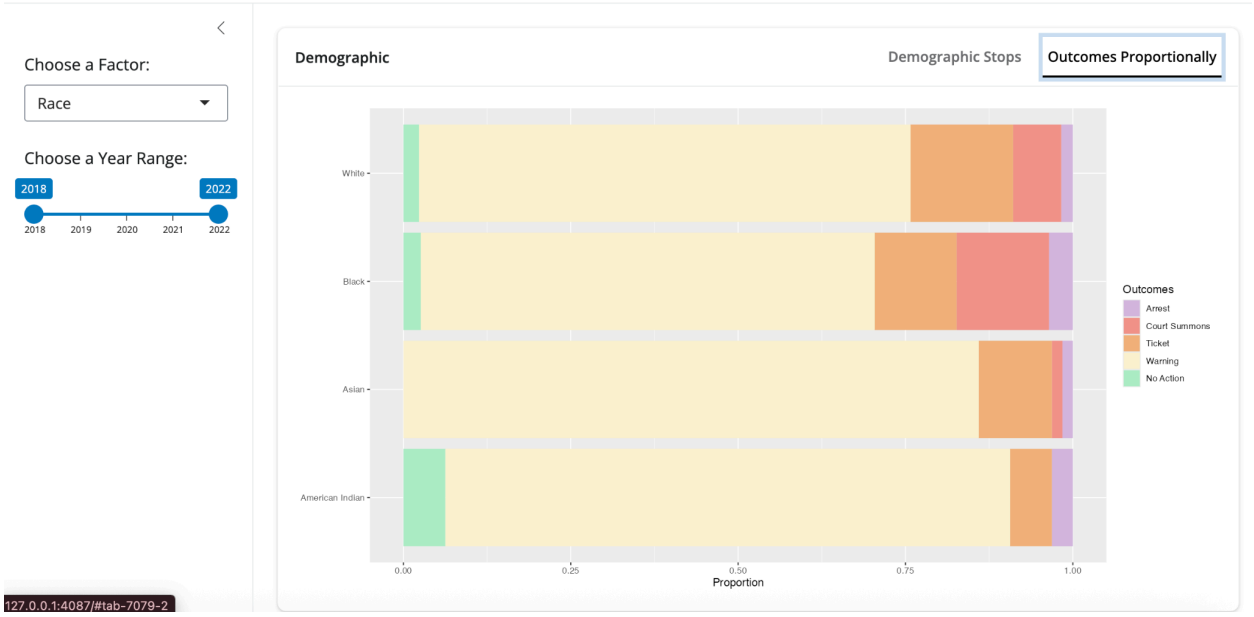
2018 2019 2020 2021 2022

Demographic

Demographic Stops | Outcomes Proportionally



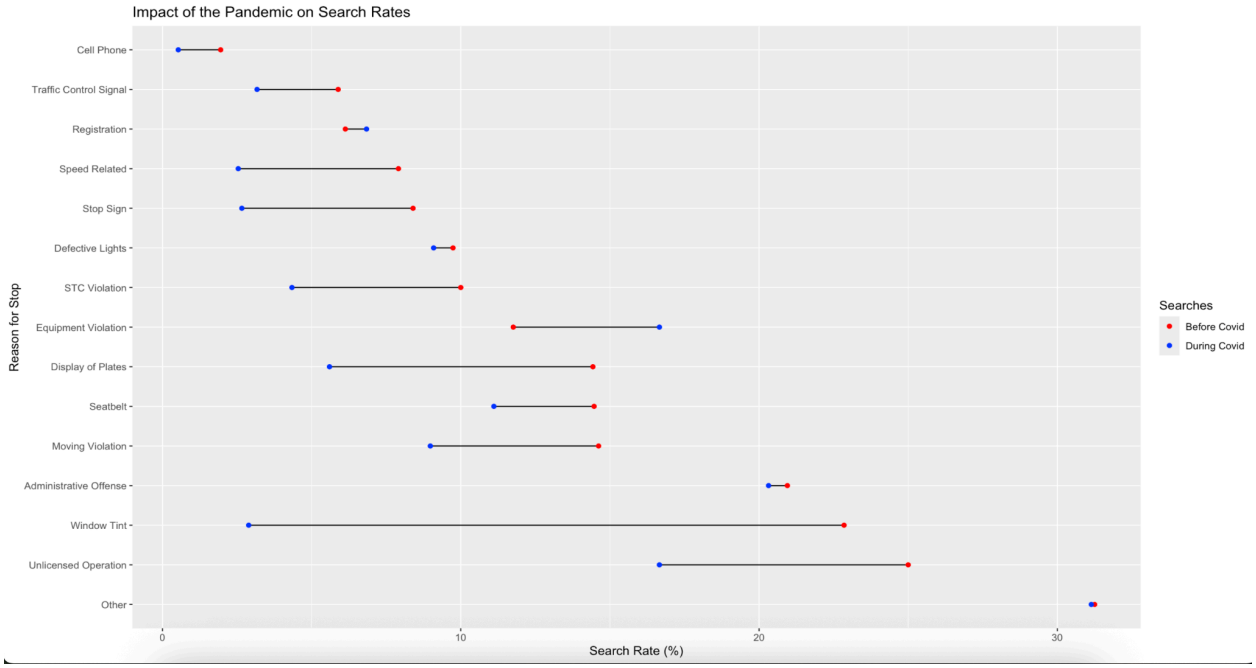




The fourth visualization, a shiny app, allows for a comprehensive look at demographics (age group, sex, or race) across any range of the 5 years. Additionally, it displays outcome distributions by any of these demographics. From this, the demographic making up the most traffic stops is white males between the ages of 25 to 34. Through using this app extensively one notable remark is Asian drivers register zero no action outcomes in the entire 5 years. While the absolute count of Asian stops is smaller than for other groups, this complete absence of no action

suggests potential procedural or reporting differences. Future analyses should disaggregate by stop reason and location, and scrutinize departmental guidelines, to uncover whether distinct thresholds or biases shape these outcomes.

Visualization V.



Because overall stop volumes plunged during the pandemic, the fifth visualization examines search-rate proportions, meaning, the percentage of stops resulting in a search, for each of the fifteen individual stop reasons, comparing 2018 - 2019 (pre-COVID) to 2020 - 2022 (during COVID). Nearly every category exhibits a lower search rate during the pandemic, with two exceptions: search rates increased for Equipment Violation stops and remained essentially unchanged for Other reasons. The most dramatic decline occurs with Window Tint stops, where the search rate falls from 23 percent pre-pandemic to about 3 percent during. These patterns likely reflect officers' efforts to minimize close contact amid health concerns, reserving searches for situations deemed most critical. Correlating these trends with internal memos or health-safety directives would help confirm whether COVID-related guidance influenced search behavior.

Conclusion.

Together, these findings illuminate how Middletown's traffic enforcement adapted over five years, revealing significant temporal, demographic, and procedural shifts. Key questions for

further investigation include: Does Officer 3235's elevated rate of stopping Black drivers indicate bias or simply reflect patrol assignments? To what extent did public-health directives drive the broad drop in search-rate proportions, with exceptions for high-priority categories? And why do Asian drivers never receive no action—does this reflect bias or reporting practices and guideline differences? Addressing these questions will require statistical tests controlling for patrol location and volume, qualitative reviews of policy documents, officer interviews, geospatial mapping of stop locations, time-of-day analyses, and an extension of the dataset through 2023–2024. Such work will deepen our understanding of how policing strategies evolve in response to community contexts and crises.