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TRAFFIC STOP DATA ANALYSIS AND FINDINGS, 2020

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This report was written by the Institute for Municipal and Regional Policy (IMRP) at the University of Connecticut with the help of Matthew B. Ross and Jesse Kalinowski who applied the statistical tests known as the "Veil of Darkness", "Synthetic Control", "Stop Disposition", and "KPT Hit Rate."

TABLE OF CONTENTS

LIST OF TABLES

II: Characteristics of Traffic Stop Data

III: Analysis of Traffic Stops, Veil of Darkness

V: Analysis of Traffic Stops, Descriptive Statistics and Intuitive Measures

VI: Analysis of Stop Dispositions

VII: Analysis of Vehicular Searches

X: Middletown Follow-Up Analysis Summary

LIST OF FIGURES

II: Characteristics of Traffic Stops

III: Analysis of Traffic Stops, Veil of Darkness

IV. Analysis of Traffic Stops, Synthetic Control

VII: Analysis of Vehicular Searches

X: Middletown Follow-Up Analysis Summary

PREAMBLE

This preamble was written by an ad-hoc committee of the Connecticut Racial Profiling Prohibition Project advisory board and endorsed unanimously by the board on December 6, 2018.

1. Racial Profiling has historically occurred and continues to occur throughout America.
2. The Alvin W. Penn Racial Profiling Law enacted by the Connecticut General Assembly in 1999 required state and local police to collect traffic stop data and report the data to the state.
3. The 2011 federal investigation into the East Haven Police Department brought this issue to the forefront in Connecticut again and led to the Connecticut General Assembly updating the Profiling Legislation in 2012.
4. Disparities across racial and ethnic groups occur in traffic stops in Connecticut.
5. Enforcing the law's data reporting requirement and collecting and analyzing racial disparities in traffic stop records in the primary charge of the advisory board.
    a. A broader analysis, utilizing multiple methodologies in the preferred method for measuring for the presence of racial disparities in traffic enforcement;
    b. Although no measure is 100% accurate in measuring disparities, the analysis utilized in Connecticut is sufficient in determining the presence of disparities;
    c. We will continue to modify and refine our methodologies based on the best available research and accepted practices in the field.
6. We will take a proactive approach in understanding, explaining and addressing disparities found in the analysis by:
    a. Utilizing input from all stakeholders to understand the underlying causes for such disparities;
    b. Clearly explaining to the public and stakeholders if there are justifiable reasons for such disparities;
    c. Reporting to the Office of Policy and Management instances where the Connecticut Racial Profiling Prohibition Project Advisory Board believes that a police department is in violation of the Alvin W. Penn law.

EXECUTIVE SUMMARY OF FINDINGS

The Alvin W. Penn Racial Profiling Prohibition Act (Public Act 99-198) was first enacted in 1999 in the State of Connecticut. The law prohibits any law enforcement agency in the state from stopping, detaining, or searching motorists when the stop is motivated solely by considerations of the race, color, ethnicity, age, gender, or sexual orientation of that individual (Connecticut General Statutes Sections 54-1l and 54-1m). In 2012 and 2013, the Connecticut General Assembly made several major revisions to the law in an effort to ensure its effective implementation. In accordance with these changes, police agencies began collecting data pertaining to all traffic stops on October 1, 2013.

In 2012, the Racial Profiling Prohibition Project Advisory Board was established to advise the Office of Policy and Management (OPM) in adopting the law's standardized methods and guidelines. The Institute for Municipal and Regional Policy (IMRP) at Central Connecticut State University was tasked to help oversee the design, evaluation, and management of the racial profiling study mandated by Public Act No. 12-74 and Public Act No. 13-75, "An Act Concerning Traffic Stop Information." The project staff worked with the state's Criminal Justice Information System (CJIS) to develop a system to collect consistent and universal traffic stop information and submit it to CJIS electronically on a monthly basis.

In Connecticut, there are a total of 94 municipal police departments: 29 departments employing more than 50 officers, 50 employing between 20 and 50 officers, and 15 with fewer than 20 officers. State police are comprised of 11 distinct troops. Although there are an additional 80 jurisdictions that do not have organized police departments and are provided police services by the state police, either directly or through provision of resident troopers, these stops were categorized with their overarching state police troops. Additionally, a total of 13 special agencies has the authority to conduct traffic stops.

As per section 54-1m of the Connecticut General Statutes, the IMRP is required to submit an annual report analyzing traffic stops records for all police departments in Connecticut. This is the seventh annual report published by the IMRP and presents the results from an analysis of approximately 248,000 traffic stops conducted during the 12-month study period from January 1, 2020 through December 31, 2020. It also presents a three-year aggregate analysis of the approximately 1,300,000 traffic stops conducted between January 1, 2018 to December 31, 2020. This report serves as a screening tool, essentially highlighting areas where disparities between races and ethnicities are greatest in traffic enforcement throughout the state.

All departments and communities would benefit from carefully reviewing the findings in this report. Addressing statewide racial and ethnic disparities will require a collective effort of all law enforcement and community stakeholders. An atmosphere of open-mindedness, empathy, and honesty from all stakeholders remains necessary to create sustained police legitimacy and a safer, more just society. The authors of this report are hopeful that the information contained herein will be valuable to the citizens of Connecticut as they seek to fulfill the promise of the Alvin W. Penn Act. We are both humbled and grateful for the opportunity to be part of this important effort.

E.1: 2020 AND 2018-20 STATEWIDE TRAFFIC STOP ANALYSIS AND FINDINGS

Assessing racial disparities in policing data has been used for the last two decades as a policy tool to evaluate whether there exists the possibility that racial and ethnic bias is occurring within a given jurisdiction. The statistical evaluation of policing data in Connecticut is an important step towards developing a transparent dialogue between law enforcement and the public at large. As such, it is the goal of this report to present the results of that evaluation in the most transparent and unbiased manner possible. The report is organized to lead the reader through seven distinct analytical tests that vary in their assumptions and level of scrutiny. The intent behind this approach is to apply multiple tests as a screening filter for the possibility that any one test (1) produces false positive results or (2) reports a false negative.

The research strategy underlying the statistical analysis presented in chapters three through seven of this report was developed with three guiding principles in mind. Each principle was considered throughout the research process and when selecting the appropriate results to display publicly. A better understanding of these principles helps to frame the results presented in the technical portions of the analysis. In addition, by presenting these principles at the onset of the report, readers have a better context to understand the overall framework of the approach.

> *Principle 1: Acknowledge that statistical evaluation is limited to finding racial and ethnic disparities that are indicative of racial and ethnic bias but that, in the absence of a formal procedural investigation, cannot be considered comprehensive evidence.*
>
> *Principle 2: Apply a holistic approach for assessing racial and ethnic disparities in Connecticut policing data by using a variety of approaches that rely on well-respected techniques from existing literature.*
>
> *Principle 3: Outline the assumptions and limitations of each approach transparently so that the public and policy makers can use their judgment in drawing conclusions from the analysis.*

We emphasize the message that any statistical test is only truly capable of identifying racial and ethnic disparities. Such findings provide a mechanism to indicate possible racial profiling, but they cannot, without further investigation, provide sufficient evidence that racial profiling exists.

E.1 (A): Findings from the Statewide Analysis

Municipal and State Police departments in Connecticut made only 247,934 traffic stops in 2020 (1,263,440 in 2018-20) of which 60% (63%) were of White non-Hispanic motorists while 19% (17.8%) were Black and 17% (15.8%) were of Hispanic motorists. At the aggregate level, we present estimates from applying the veil of darkness analysis, a search hit-rate analysis, and a post-stop disposition analysis. The veil of darkness analysis exploits quasi-random variation in the timing of sunset to identify potential discrimination in the decision to stop a motorist. According to the results from applying this test, the estimated change from daylight to darkness in the odds a stopped motorist is a Black was 0.96 in 2018, 0.97 in 2019, and 0.97 in 2020. The change from daylight to darkness in the odds a stopped motorist is Hispanic was 1.06 in 2018, 1.06 in 2019, and 1.04 in 2020. In general, the disparity in the decision to stop a minority motorist has remained relatively stable in terms of magnitude and statistical precision from 2018 through 2020.

The key identifying assumption of this test is that police officers who are inclined to racially profile motorists are better able to do so during daylight when motorist race is more easily observed prior to making a traffic stop. Following this logic, the results suggest that police in Connecticut are more likely to stop a Hispanic motorist in daylight relative to darkness which is indicative of potential adverse treatment. We also find evidence that Black motorists are actually less likely to be stopped by police in daylight. However, Kalinowski et al. (2021) suggest that a statistically significant finding of "reverse discrimination" (i.e. a disparity for White non-Hispanic motorists) may also be consistent with bias against minorities if they are adjusting their driving behavior to avoid detection by police during daylight. Without additional analysis examining changes in driving behavior by racial and ethnic minority motorists, it is difficult to interpret the aggregate results for Black motorists.

In 2020, Municipal and State Police departments in Connecticut also conducted a total of only 8,199 (3.3%) motor vehicle searches of which 37% were of non-Hispanic Caucasian motorists while 33% were of Black and 29% were of Hispanic motorists. At the aggregate level, we present estimates comparing the likelihood a search resulted in contraband being found for non-Hispanic Caucasian motorists relative to minority motorists. In addition, we compare the disposition of traffic stops across these groups after conditioning on the motivating reason for the traffic stop. The rate at which discretionary searches of non-Hispanic Caucasian motorists yielded contraband was 42.4 % in 2018, 41.5% in 2019, and 40.8% in 2020. The rate at which searches of Black and Hispanic motorists yielded contraband was 36.4% and 34.4% respectively in 2018, 34.4% and 33.3% respectively in 2019, and 37.3% and 37.1% respectively in 2020. The key identifying assumption of this test is that police will search minority motorists more often than whites but only relative to their expected likelihood of carrying contraband. Thus, the significant lower hit-rate for minority motorists suggests the potential presence of a preference on the part of police for searching minority motorist. Similarly, the stop disposition analysis suggests minority motorists are more likely to receive a warning and less likely to be searched overall even after condition on the motivating reason for the stop. The post-stop analysis did not identify any individual departments in the department-level analysis in 2020. However, the disparity in the decision to search a minority motorist has remained relatively stable in magnitude and statistical precision from 2018 through 2020.

Veil of Darkness Analysis Findings, 2020 and 2018-20

In an effort to better identify the source of these racial and ethnic disparities, each analysis was repeated at the department level for both the 2020 calendar year and the 2018 to 2020 aggregate sample. The threshold for identifying individual departments was the presence of a disparity that was statistically significant at the 95 percent level in the Black or Hispanic alone categories.[1] By construction, the departments that were identified as having a statistically significant disparity are the largest contributors to the overall statewide results. Here, the unit of analysis is a municipal department or State Police Troop where disparities could be a function of a number of factors including institutional culture, departmental policy, or individual officers.[2]

In total, we identify three State Police Troops, one in the 2020 sample only, one in both the 2020 sample and the three-year aggregate sample, and one in the three-year aggregate sample only. We

[1] Put simply, there must have been at least a 95 percent chance that the motorists were more likely to be stopped at a higher rate relative to white Non-Hispanic motorists.

[2] Since department or state police barrack estimates represent an average effect of stops made by individual officers weighted by the number of stops that they made, it is possible that officer-level disparities exist in departments which were not identified.

also identified two municipal police departments in the three-year aggregate sample. Of the two municipal police departments identified in the three-year aggregate sample, one department was identified in a previous annual study. For all departments identified in either the 2020 or three-year aggregate samples, we conclude that there is strong evidence that a disparity exists in the rate of minority traffic stops made during daylight conditions. These departments include:

State Police Headquarters

State Police Headquarters was identified on the veil of darkness analysis in 2020 sample for Black motorists. The veil of darkness analysis exploits quasi-random variation in visibility to identify potential discrimination controlling for day of week and time of day. During the sample window for this test, the odds a stopped motorist was Black totaled 0.246 in darkness when we presume that police are less able to detect the race of a motorist prior to making a traffic stop. Conditioning on day of the week and time of day, the odds a stopped motorist was Black grew to 0.453 during daylight when we presume that police are better able to detect race.

State Police Troop D

State Police Troop D was identified on the veil of darkness analysis in the 2020 sample and combined 2018-20 sample for Black motorists. The veil of darkness analysis exploits quasi-random variation in visibility to identify potential discrimination controlling for day of week and time of day. During the 2020 sample window for this test, the odds a stopped motorist was Black totaled 0.077 in darkness when we presume that police are less able to detect the race of a motorist prior to making a traffic stop. Conditioning on day of the week and time of day, the odds a stopped motorist was Black grew to 0.122 during daylight when we presume that police are better able to detect race. During the combined 2018-20 sample window for this test, the odds a stopped motorist was Black totaled 0.060 in darkness when we presume that police are less able to detect the race of a motorist prior to making a traffic stop. Conditioning on day of the week and time of day, the odds a stopped motorist was Black grew to 0.086 during daylight when we presume that police are better able to detect race.

State Police Troop L

State Police Troop L was identified on the veil of darkness analysis in the combined 2018-20 sample for Hispanic motorists. The veil of darkness analysis exploits quasi-random variation in visibility to identify potential discrimination controlling for day of week and time of day. During the sample window for this test, the odds a stopped motorist was Hispanic totaled 0.078 in darkness when we presume that police are less able to detect the race of a motorist prior to making a traffic stop. Conditioning on day of the week and time of day, the odds a stopped motorist was Hispanic grew to 0.116 during daylight when we presume that police are better able to detect race.

Middletown:

Middletown was identified on the veil of darkness analysis in the combined 2018-20 sample for Hispanic motorists. The veil of darkness analysis exploits quasi-random variation in visibility to identify potential discrimination controlling for day of week and time of day. During the sample window for this test, the odds a stopped motorist was Hispanic totaled 0.163 in darkness when we presume that police are less able to detect the race of a motorist

prior to making a traffic stop. Conditioning on day of the week and time of day, the odds a stopped motorist was Hispanic grew to 0.246 during daylight when we presume that police are better able to detect race.

Ridgefield:

Ridgefield was identified on the veil of darkness analysis in the combined 2018-20 sample for Black motorists. The veil of darkness analysis exploits quasi-random variation in visibility to identify potential discrimination controlling for day of week and time of day. During the sample window for this test, the odds a stopped motorist was Black totaled 0.053 in darkness when we presume that police are less able to detect the race of a motorist prior to making a traffic stop. Conditioning on day of the week and time of day, the odds a stopped motorist was Black grew to 0.120 during daylight when we presume that police are better able to detect race.

Other Statistical and Descriptive Measure Analysis Findings, 2020 and 2018-20

In addition to the two municipal police departments and three State Police troops identified to exhibit statistically significant racial or ethnic disparities in the Veil of Darkness analysis, a number of other departments were identified using either the descriptive tests, stop disposition test or KPT hit-rate analysis. Identification in any one of these tests alone is not, in and of itself, sufficient to be identified for further analysis. However, these additional tests are designed as an additional screening tool to identify the jurisdictions where consistent disparities exceed certain thresholds that appear in the data. Although it is understood that certain assumptions have been made in the design of each of these measures, it is reasonable to believe that departments with consistent data disparities that separate them from the majority of other departments should be subject to further review and analysis with respect to the factors that may be causing these differences.

The results from estimating whether individual departments stopped more minority motorists relative to their requisite synthetic control found 24 municipal police departments, and 3 State Police troops to have a disparity that was statistically significant at the 95 percent level in the Black or Hispanic alone categories and withstood doubly-robust estimation, and had a false discovery rate below 10%. *Bridgeport, Cheshire, State Police Troop H, East Haven, Meriden, Newington, North Haven, Orange, Wallingford, Waterford, Wethersfield,* and *Wolcott* were identified in the 2020 sample and the aggregate 2018 to 2020 sample. *Berlin, State Police Troop G*, *State Police Troop I, Hamden, New Britain, New Haven, Ridgefield,* and *South Windsor* were identified only in the 2020 sample. Lastly, *Avon, Brookfield, Easton, Farmington, Groton Town, Plainville,* and *Stonington* were identified only in the three-year aggregate analysis.

The descriptive tests are designed as an additional tool to identify disparities that exceed certain thresholds that appear in a series of census-based benchmarks. Those three benchmarks are: (1) statewide average, (2) the estimated commuter driving population, and (3) resident-only stops. Although 71 municipal police departments were identified with racial and ethnic disparities when compared to one or more of the descriptive measures, only *Stratford, Meriden, Newington, Windsor Locks, New Britain, Waterbury, Vernon, West Hartford, Wolcott, Woodbridge, East Hartford, Wethersfield, Norwich, Orange,* and *South Windsor* exceeded the disparity threshold in more than half the benchmark areas.

In aggregate, minority motorists stopped by police departments were found to have a statistically different distribution of outcomes conditional on the basis for which they were stopped. However, in the departmental analysis, there were no departments found to have a statistically significant disparity in post-stop outcomes in 2020.

The results of this test, applied to the aggregate search data for all departments in Connecticut show that departments are less successful in motorist searches across all minority groups, which is a potential indicator of disparate treatment. There was no municipal police departments or State Police Troops found to have a disparity in the hit-rate of minority motorists relative to White non-Hispanics motorists for the 2020 sample. It is worth noting that this is largely due to the fact that the overall sample of searches was extremely small in 2020 likely due to the COVID 19 pandemic. In the combined 2018-20 aggregate sample, there was one municipal police department and one State Police troop found to have a disparity in the hit-rate of minority motorists relative to White non-Hispanic motorists. Both departments survived the robustness test for the three-year aggregate sample. The one municipal department and one State Police Troop identified to exhibit a statistically significant racial or ethnic disparity in searches across all robustness tests were:

State Police Troop G:

State Police Troop G was identified on the search hit-rate analysis in the combined 2018-20 sample for Black motorists. This analysis compares the rate at which searched minority motorists are actually found with contraband to the same majority rate. In the data, contraband was found in only 8.451% of Black discretionary searches. Relative to the 20.535% of non-Hispanic Caucasian motorists, searches of minority motorists were less successful and suggestive of potential adverse treatment.

Hartford:

Hartford was identified on the search hit-rate analysis in the combined 2018-20 sample for both Black and Hispanic motorists. This analysis compares the rate at which searched minority motorists are actually found with contraband to the same majority rate. In the data, contraband was found in only 11 % of Black and 14% of Hispanic discretionary searches. Relative to the 25% of non-Hispanic Caucasian motorists, searches of minority motorists were less successful. The results unambiguously indicate that Hartford police is disproportionately less likely to be successful searching minority motorists relative to their White non-Hispanic peers.

E.1 (B): Conclusions from the Statewide Analysis

The analysis presented in chapters III through VII of this report should be utilized as a screening tool by which researchers, law enforcement administrators, community members and other appropriate stakeholders focus resources on those departments displaying the greatest level of disparities in their respective stop data. As noted previously, racial and ethnic disparities in any traffic stop analysis do not, by themselves, provide conclusive evidence of racial profiling. Statistical disparities do, however, provide significant evidence of the presence of idiosyncratic data trends that warrant further analysis.

In order to determine if a departments racial and ethnic disparities warrant additional in-depth analysis, researchers review the results from some of the analytical sections of the report. The threshold for identifying significant racial and ethnic disparities for departments is described in each

section of the report (ex. departments with a disparity that was statistically significant at the 95 percent level in the black or Hispanic alone categories in the Veil of Darkness methodology were identified as statistically significant). A department is identified for a follow-up analysis if they meet any one of the following criteria:

1. A statistically significant disparity in the one-year or three-year Veil of Darkness analysis
2. A statistically significant disparity in the one-year or three-year KPT hit rate and Stop Disposition analyses

It is worth noting that past reports have relied on results from the Synthetic Control method and Descriptive Statistics to identify departments for additional analysis. Although results from those methods are provided in the report, the authors believe that since 2010 census information forms much of the foundation of these measures, it would be more appropriate to limit the use of these tests until 2020 census data has been fully incorporated into the analysis. The authors also believe that the inclusion of a three-year aggregate analysis significantly improves our ability to utilize the more sophisticated statistical techniques, especially on departments with small annual sample sizes. Improvements have also been made to the post-stop measures to make them more rigorous and statistically sound.

In general, we continue to identify far fewer departments in this report relative to prior year's studies with only two municipal departments and three State Police troops. Of the two municipal departments, all were identified in the three-year aggregate sample only. One of the three State Police Troops was only identified in the combined 2018-20 sample and the two other State Police Troops were identified in both the 2020 sample and the combined 2018-20 sample. Based on the above listed criteria it is recommended that an in-depth follow-up analysis should be conducted for the **Middletown** police department.

In addition to being identified with racial and ethnic disparities in this study, the **Ridgefield** (2018-20 sample) police department was identified with racial and ethnic disparities in the 2019 Traffic Stop Data Analysis and Findings report and the 2015-16 Traffic Stop Data Analysis and Findings report. An in-depth analysis, with recommendations, was completed and published as part of the 2015-16 Traffic Stop Data Analysis and Findings Supplemental report released in October 2018. The follow-up analysis and subsequent departmental interventions were not completed until the end of 2018. Therefore, it is reasonable that any changes made by the department would not be reflected in their data until late 2018 or early 2019. Since the three-year aggregate analysis covers a significant portion of time prior to our intervention, it is unsurprising that the department would continue to show statistically significant racial and ethnic disparities. We will continue monitoring the departments data to determine if improvements are made.

Although this year we formally identified **Troop D** (2020 sample and 2018-20 sample), **Troop L** (2018-20 sample) and **Headquarters** (2020 sample) with statistically significant racial and ethnic disparities, a comprehensive five-year analysis of traffic stop disparities for the entire State Police was published in May 2020 as part of the 2018 Traffic Stop Data Analysis and Findings report. There are very different challenges associated with assessing the racial and ethnic disparities identified for the State Police compared to municipal police departments. We will continue to monitor State Police aggregate and Troop level trends for significant variations and to determine if additional comprehensive analysis is warranted.

Another major component of addressing concerns about the possibility of racial profiling in Connecticut is bringing law enforcement officials and community members together in an effort to build trust by discussing relationships between police and the community. Public forums should be held in each identified community to bring these groups together. They serve as an important tool to inform the public of the findings and outline steps for moving forward with additional analysis. The IMRP is committed to utilizing both data and dialogue to enhance relationships between the police and community.

E.2: 2020 FOLLOW-UP ANALYSIS AND FINDINGS

A total of two municipal police departments and three state police troops were identified as having a statistically significant disparity in the conditional probability of a minority motorist being stopped in each respective jurisdiction. As noted in Part I of the report, these two municipal departments were identified across multiple statistical and descriptive tests. Although it is impossible to draw any direct inference about racial bias itself, the findings present compelling statistical evidence that warranted further investigation. In Part II of this report researchers conducted an in-depth follow-up analysis for the Middletown Police Department. A follow-up analysis, with recommendations, was previously completed for the Ridgefield Police Department in October 2018. Based on the results of the previously published follow-up analyses and our further understanding of traffic stop enforcement in Ridgefield, we do not believe another follow-up analysis would significantly add to the knowledge of factors that may have influenced these disparities already documented in the previous follow-up reports. We would refer readers to the follow-up analysis for Ridgefield published in *2015-16 Supplemental Traffic Stop Analysis and Findings report* for more specific information on the department.

Although Troop D, Troop L, and the CSP Headquarters Troop were identified with statistically significant racial and ethnic disparities, a comprehensive 5-year review of state police activity was published in May 2020. Based on the results of the previously published analyses, we do not believe another follow-up analysis this soon would significantly add to the knowledge of factors that may have influenced these disparities already documented in the previous report. We would refer readers to the follow-up analysis for Connecticut State Police published in *Traffic Stop Data Analysis and Findings, 2018* report for more specific information on the agency.

By conducting additional in-depth analysis of the Middletown Police Department, the public can have a better understanding as to why and how disparities exist. This transparency is intended to assist in achieving the goal of increasing trust between the public and law enforcement. The follow-up analysis was designed to be a collaborative effort between research staff, the police department and the community. The analysis was tailored based on the department and community's unique characteristics. Traffic stop disparities can be influenced by many factors such as the location of accidents, high call for service volume areas, high crime rate areas, and areas with major traffic generators such as shopping and entertainment districts, to name a few.

The first part of the follow-up analysis outlines additional descriptive measures that were applied to department-level data for the Middletown. In order to understand the factors that might be contributing to traffic enforcement decisions, researchers sought to understand where their respective traffic enforcement patterns occurred and why. Mapping the traffic stops is the best means to begin this part of the analysis. Unfortunately, due to the relatively low number of stops that could

be adequately identify longitude and latitude coordinates for, we decided to analyze data by roadway. Due to the lack of detailed location information available in Middletown for the majority of stops, the census tract-based analysis was replaced by a descriptive analysis of major corridors and roadways. The location information typically identified the road where the traffic stop took place, but not the specific point on the road. Although analyzing traffic stops by census tract is the preferred method, analyzing traffic stops by corridor proved just as effective an approach. The follow-up analysis also included a much more in-depth post-stop data review to examine differences in citation rates, contraband found as a result of a search, and stop reasons.

To date, traffic stop studies in other states have primarily focused on statewide or department level trends. Aside from formal investigations, there is little precedence for a state to gain a more nuanced understanding of department level enforcement patterns with an eye towards racial and ethnic disparities contained therein. Yet researchers believe it imperative to the success of this project that the conversation does not end at the identification of departments with significant racial and ethnic disparities. Indeed, the individual department follow-up proved enlightening for both researchers and the department. There is, however, always more to build upon in order to achieve the stated goals of the Alvin W. Penn Act. The follow up analysis should be viewed as a part of an ongoing process for the public, law enforcement and the law's implementing agency to gain an increasingly enhanced understanding of the factors contributing to racial and ethnic disparities in traffic stops.

BACKGROUND

First enacted in 1999, Connecticut's anti-racial profiling law entitled, the Alvin W. Penn Racial Profiling Prohibition Act (Public Act 99-198), prohibits any law enforcement agency from stopping, detaining, or searching any motorist when the stop is motivated solely by considerations of the race, color, ethnicity, age, gender or sexual orientation of that individual (Connecticut General Statutes Sections 54-1l and 54-1m). In 2012 and 2013, the Connecticut General Assembly made several changes to this law to create a system to address racial profiling concerns in Connecticut.

In 2012, the Racial Profiling Prohibition Project Advisory Board was established to advise OPM in adopting the law's standardized methods and guidelines. The Institute for Municipal and Regional Policy (IMRP) at UConn was tasked to help oversee the design, evaluation, and management of the racial profiling study mandated by PA 12-74 and PA 13-75, "An Act Concerning Traffic Stop Information." The IMRP worked with the advisory board and all appropriate parties to enhance the collection and analysis of traffic stop data in Connecticut.

Through September 30, 2013, police agencies collected traffic stop information based on requirements outlined in the original 1999 Alvin W. Penn law. Beginning October 1, 2013, police agencies had to submit traffic stop data for analysis under the new methods outlined by the Office of Policy and Management (OPM), as required by the amended racial profiling prohibition law. The law also authorized the OPM secretary to order appropriate penalties (i.e., the withholding of state funds) when municipal police departments, the Department of Emergency Services and Public Protection (DESPP), and other police departments fail to comply.

The National Highway Traffic and Safety Administration (NHTSA) provided resources for this project through a grant administered by the Connecticut Department of Transportation. The Racial Profiling Prohibition Project Advisory Board and the project staff have been meeting since May 2012 in an effort to outline a plan to successfully implement the requirements of the 2012 and 2013 legislation. The focus of the project's early phase was to better understand traffic stop data collection in other states. After an extensive review of best practices, working groups were formed and met monthly to discuss the different aspects of the project. These working groups included Data and System, Public Awareness, and Training work groups. The full advisory board held more than 25 meetings and the working groups met approximately 60 times.

The advisory board and IMRP also worked with law enforcement officials to create a data collection system that is efficient, not burdensome to the police collecting it, and provides information that is easy to work with when it is submitted. Police agencies in Connecticut vary in their levels of sophistication and technological capacity with respect to how they collect and report data. The project staff worked with the state's Criminal Justice Information System (CJIS) to develop a system to collect consistent and universal traffic stop information and submit it to CJIS electronically on a monthly basis.

The IMRP developed and maintains a project website (www.ctrp3.org) that informs the public of the advisory board's activities, statewide informational forums, and related news items on racial profiling. The website includes meeting agendas and minutes, press releases, and links to register for events. The website is updated weekly. In addition to the project website, the IMRP partnered with the Connecticut Data Collaborative to publish all traffic stop data on a quarterly basis. The public can

download the information in its original form or view summary tables for easy use. A full set of analytical tools will be available for more advanced users who are interested in data analysis.

Although much of the initial focus of this project was to develop a standardized method for data collection and analysis, there are other important components. The initiatives include a public awareness and education campaign, effective training for officers and departments, and a rigorous complaint process. Information about all of these initiatives is provided on the project website. These initiatives collectively represent different tools available for education and the prevention of racial profiling in policing. These tools were implemented in the hope of building and enhancing trust between communities and law enforcement in Connecticut.

In February 2014, the U.S. Department of Justice, Community Oriented Policing Services Division, sponsored a train-the-trainer program in Connecticut on "Fair and Impartial Policing (FIP)." The FIP program was established to train police officers and supervisors on fair and impartial policing by understanding both conscious and unconscious bias. This program was offered to police agencies throughout the state over the next year.

Lastly, a major component of addressing concerns about the possibility of racial profiling in Connecticut is bringing law enforcement officials and community members together to discuss relationships between police and the community. The project staff has conducted several public forums throughout the state to bring these groups together and will continue these dialogues in the foreseeable future. They serve as an important tool to inform the public of their rights and the role of law enforcement in serving their communities.

I: METHODOLOGICAL APPROACH UNDERLYING THE ANALYSIS

Assessing racial disparities in policing data has been used for the last two decades as a policy tool to evaluate whether racial bias exists within a given jurisdiction. Although there has always been widespread public support for the equitable treatment of individuals of all races, recent national headlines have brought this issue to the forefront of American consciousness and prompted a contentious national debate about policing policy. The statistical evaluation of policing data in Connecticut is an important step towards developing a transparent dialogue between law enforcement and the public. As such, this report's goal is to present the results of that evaluation in a transparent and unbiased manner.

The research strategy underlying this statistical analysis was developed with consideration to three guiding principles. Each principle served as an important foundation for the research process, particularly when selecting the appropriate results to disseminate to the public. A better understanding of these principles helps to frame the results in the technical portions of the analysis. Further, presenting these principles at the outset of the report provides readers with the appropriate context to understand our overall approach.

> *Principle 1: Acknowledge that statistical evaluation is limited to finding racial and ethnic disparities that are indicative of racial and ethnic bias but that, in the absence of a formal procedural investigation, cannot be considered comprehensive evidence.*
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> *Principle 2: Apply a holistic approach for assessing racial and ethnic disparities in Connecticut policing data by using a variety of approaches that rely on well-respected techniques from existing literature.*
>
> *Principle 3: Outline the assumptions and limitations of each approach transparently so that the public and policy-makers can use their judgment in drawing conclusions from the analysis.*

The report is organized to lead the reader through a host of descriptive and statistical tests that vary in their assumptions and level of scrutiny. The intent behind this approach is to apply multiple tests as a screening filter for the possibility that any one test (1) produces false positive results or (2) reports a false negative. Seven distinct analytical tools were used to evaluate whether racial and ethnic disparities are present in the Connecticut policing data. In the analysis, the demography of motorists was grouped into four overlapping categories to ensure a large enough sample size for the statistical analysis. Although much of the analysis focuses on stops made of black (Hispanic or non-Hispanic) and Hispanic motorists (any race), the analysis was also conducted for aggregated groupings of all non-white motorists (Hispanic or non-Hispanic) as well as a combined sample of black and Hispanic motorists. In terms of identifying departments or state police barracks in individual tests, the estimated disparity (i.e. the higher likelihood of stopping a minority motorist) must have been estimated with at least a 95 percent level of statistical significance for either black or Hispanic motorists alone. Put simply, under the rigorous conditions set by each test, there must have

been at least a 95 percent chance that either black or Hispanic motorists were more likely to be stopped (or searched) at a higher rate relative to Caucasian non-Hispanic motorists.

The analysis begins by first presenting a method referred to as the Veil of Darkness was used to assess the existence of racial and ethnic disparities in stop data. The test is a statistical technique that was developed by Jeffery Grogger and Greg Ridgeway (2006) and published in the *Journal of the American Statistical Association*. The Veil of Darkness analysis examines a restricted sample of stops occurring during the "inter-twilight window" and assesses relative differences in the ratio of minority to non-minority stops that occur in daylight as compared to darkness. The inter-twilight window restricts stops to a fixed window of time throughout the year when visibility varies due to seasonality as well as the discrete daylight savings time shift. This technique relies on the idea that, if police officers are profiling motorists, they are better able to do so during daylight hours when race and ethnicity is more easily observed. After restricting the sample of stops to the inter-twilight window and controlling for things like the time of day and day of week, any remaining difference in the likelihood a minority motorist is stopped during daylight is attributed to disparate treatment. This analytical approach is considered the most rigorous and broadly applicable of all the tests presented in this report.

The second analytical tool used in the analysis is the synthetic control where the number of minority traffic stops in a given department is evaluated against a benchmark constructed using stops made by all other departments in Connecticut. Since departments differ in terms of their enforcement activity (i.e. time of stops, reason for stops, etc.) and the underlying demographics of the population on the roadway, this analysis relies on the rich statistical literature on propensity scores. Here, a propensity score is a measure of how similar a stop made outside a given department is to a stop made by the department being analyzed. These measures of similarity are used to weight stops when constructing an individual benchmark for each department. For example, if the department being analyzed has a high minority population and makes most of their stops on Friday nights at 7PM for speeding violations then stops made for speeding violations by departments with a similar residential population at this time and day will be given more weight when constructing the benchmark. This methodology ensures that there is an apples-to-apples comparison between the number of minorities stopped in a given town relative to their benchmark and allows for the interpretation of any remaining differences to be attributed to possible disparate treatment.

The three techniques contained in Chapter 5 are descriptive in nature and compare department-level data to three benchmarks (statewide average, estimated commuter driving populations, and resident population). These methods are referred to as population benchmarks and are commonly used to evaluate racial disparities in police data across the country. The statewide average comparison provides a simple and effective way to establish a baseline for all departments from which the relative differences between department stop numbers and the average for the state are compared. A comparison to the statewide average is presented alongside the context necessary to understand differences between local jurisdictions. Next, researchers adjust "static" residential census data to approximate the estimated driving demographics in a particular jurisdiction. Residential census data can be modified to create a reasonable estimate of the possible presence of many nonresidents likely to be driving in a given community because they work there and live elsewhere. This estimate is a composition of the driving population during typical commuting hours based on data provided by the U.S. Census Bureau. The final population benchmark comparison limits the analysis to stops involving only residents of the community and compares them to the community demographics

based on the most recent decennial census for residents age 16 and over. Although any one of these benchmarks cannot provide by itself a rigorous enough analysis to draw conclusions regarding racial disparities, if taken together with the more rigorous statistical methods they do serve as a useful tool.

The sixth analytical tool used in the analysis tests for disparities in the outcomes of traffic stops using a model that examines the distribution of dispositions conditional on race and the reason for the stop. Specifically, we test whether traffic stops made of minority motorists result in different outcomes relative to their white non-Hispanic peers. We provide one important cautionary note about interpreting this test as causal evidence of discrimination. Ideally, this test would be performed on data containing *all* violations observed by the police officer prior to making a traffic stop and where we would include a control for the number of total violations. In practice, data on traffic stops typically only contain the most severe reason that motivated the stop. In the absence of data on the full set of violations observed by police officers, we suggest that the reader interpret results from this test as providing descriptive evidence to be viewed in concert with other such empirical measures.

Lastly, an analysis of post-stop outcomes using a hit-rate approach following a technique published in the *Journal of Political Economy* by Knowles, Persico and Todd (2001). The hit-rate approach relies on the idea that motorists rationally adjust their propensity to carry contraband in response to their likelihood of being searched by police. Similarly, police officers rationally decide whether to search a motorist based on visible indicators of guilt and an expectation of the likelihood that a given motorist might have contraband. According to the model, a demographic group of motorists would be searched by police more often than white non-Hispanic motorists if they were more likely to carry contraband. However, the higher level of searches should be exactly proportional to the higher propensity for this group to carry contraband. Thus, in the absence of racial animus, we should expect the rate of successful searches (i.e. the hit-rate) to be equal across different demographic groups regardless of differences in their propensity to carry contraband. [3] In this test, discrimination is interpreted as a preference for searching minority motorists that shows up statistically as a lower hit-rate relative to Caucasian motorists. Note that this test inherently says nothing about disparate treatment in the decision to stop motorists as it is limited in scope to vehicular searches.

In short, we move forward with the overall goal of identifying the statistically significant racial and ethnic disparities in Connecticut policing data. A variety of statistical tests are applied to the data in the hope of providing a comprehensive approach based on the lessons learned from academic and policy applications. Our explanations of the mechanisms and assumptions that underlie each of the tests are intended to provide policymakers and the public with enough information to assess the data and draw their own conclusions from the findings.

Finally, we emphasize the message that any statistical test is only truly capable of identifying racial and ethnic disparities. Such findings provide a mechanism to indicate possible racial profiling but they cannot, without further investigation, provide sufficient evidence that racial profiling exists.

[3] Although some criticism has risen concerning the technique and extensions have suggested that more disaggregated groupings of searches be used in the test, the ability to implement such improvements is limited by the small overall sample of searches in a single year of traffic stops. Despite these limitations, the hit-rate analysis is still widely applied in practice and contributes to the overall understanding of post-stop police behavior in Connecticut.

II: CHARACTERISTICS OF TRAFFIC STOP DATA

This section examines general patterns of traffic enforcement activities in Connecticut for the study period of January 1, 2020 to December 31, 2020. Statewide and agency activity information can be used to identify variations in traffic stop patterns to help law enforcement and local communities understand more about traffic enforcement. Although some comparisons can be made between similar communities, we caution against comparing agencies' data in this section of the report. Please note that the tables included in this report present information from only a limited number of departments. Complete tables for all agencies are included in the technical appendix.

In Connecticut, more than 247,000 traffic stops were conducted during the 12-month study period. Compared to previous years, traffic enforcement was down more than 50% in 2020. The State of Connecticut was significantly impacted by the COVID-19 pandemic starting in mid-March 2020. By April 2020, residents began working from home in large numbers, retail and entertain establishments temporarily closed, schools closed, and there were far fewer drivers on the roads. Police departments were also trying to reduce contact with the public, where appropriate, to reduce the potential transmission of COVID-19. April 2020 was the most impacted month with fewer than 3,000 traffic stops. Historically, the most traffic stops occur in April with an average of 50,000. Although traffic enforcement increased in May 2020, it remained at a relatively suppressed level for the rest of the year. That being said, almost 68% of the total stops were conducted by the 94 municipal police departments, 31% of the total stops were conducted by state police, and the remaining 1% of stops were conducted by other miscellaneous policing agencies. Figure 2.1 shows the aggregate number of traffic stops by month along with each demographic category.

Figure 2.1: Aggregate Traffic Stops by Month of the Year

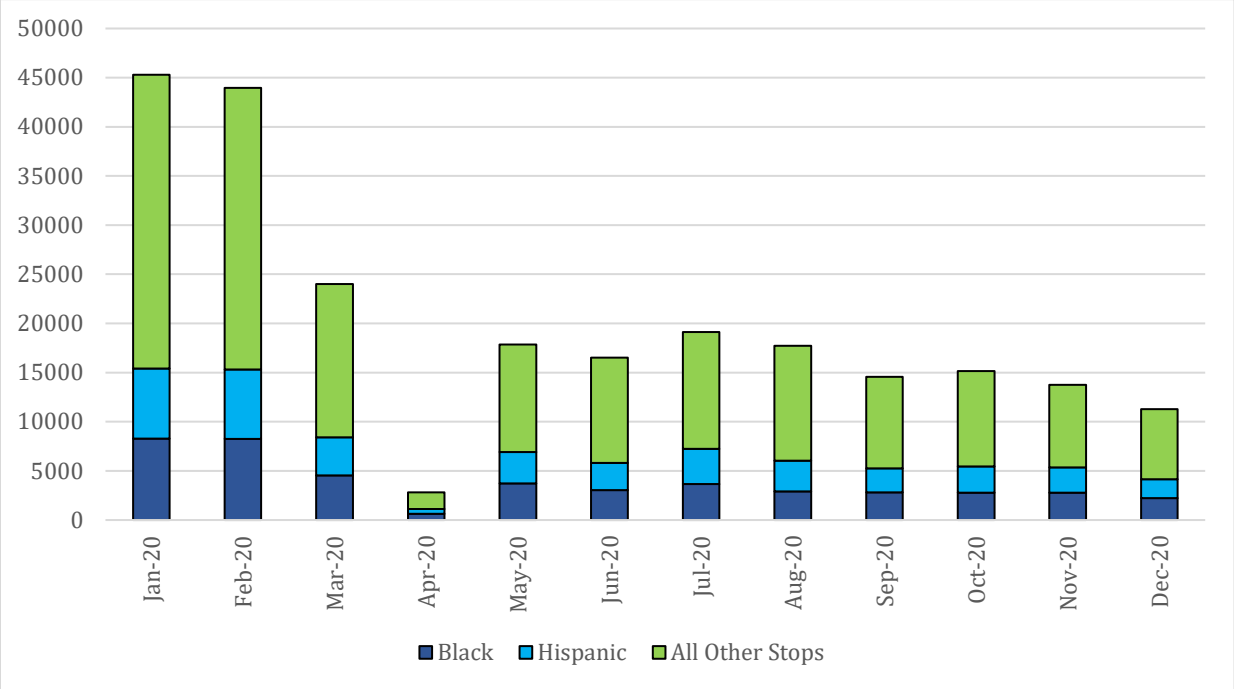


Figure 2.2 displays traffic stops by time of day for the entire analysis period. As can be seen from the figure, the total volume of traffic stops fluctuates significantly across different times of the day. The highest hourly volume of traffic stops in the sample occurred from five to six in the evening and accounted for 7.1% of all stops. It is not surprising that the volume of traffic stops increases between these hours as this is a peak commuting time in Connecticut. The lowest volume of traffic stops occurred between four and five in the morning. In the past, traffic enforcement remained suppressed during the morning commuting hours, but that does not appear to be the case in 2020. However, COVID-19 dramatically impacted employment commutation throughout most of the year.

The evening commute represents a period when a significant proportion of traffic stops are made. The surge seen between the hours of four and seven at night represents the most significant period of traffic enforcement. In aggregate, stops occurring between these hours represented 19.1% of total stops. Interestingly, there seems to be a significant correlation between the proportion of minority stops and the overall volume of stops. In particular, the share of Hispanic and Black stops increases when the total volume of stops decreases.

Figure 2.2: Aggregate Traffic Stops by Time of Day

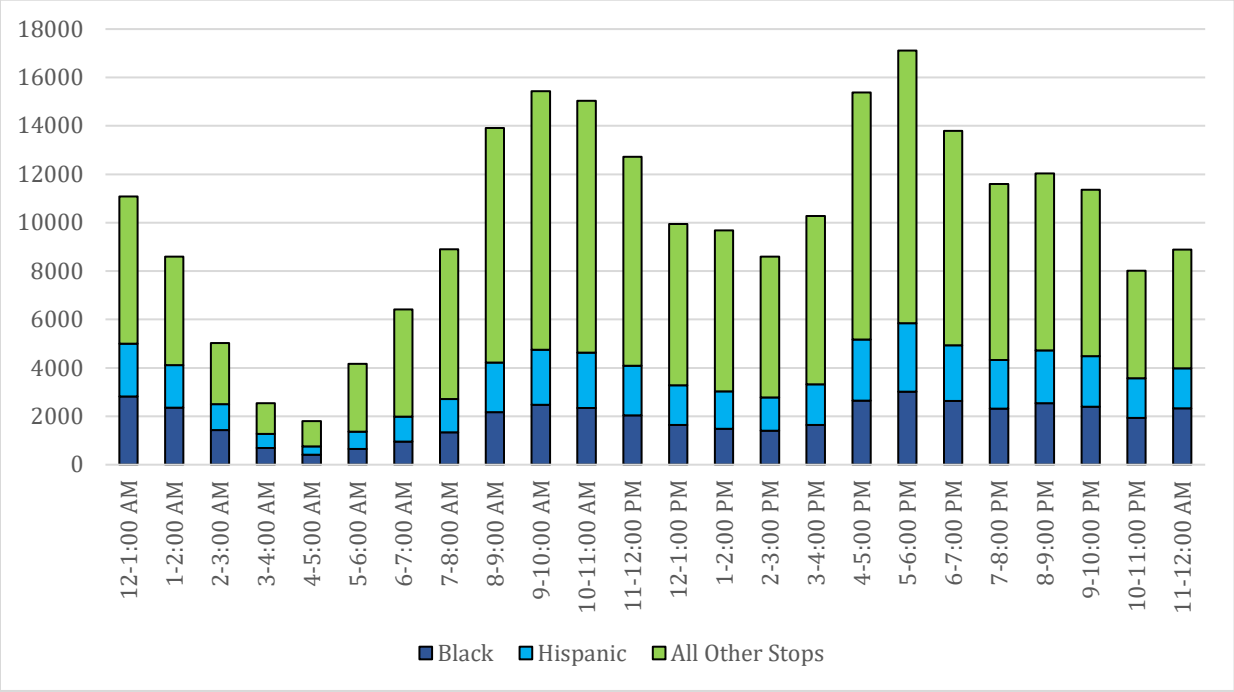
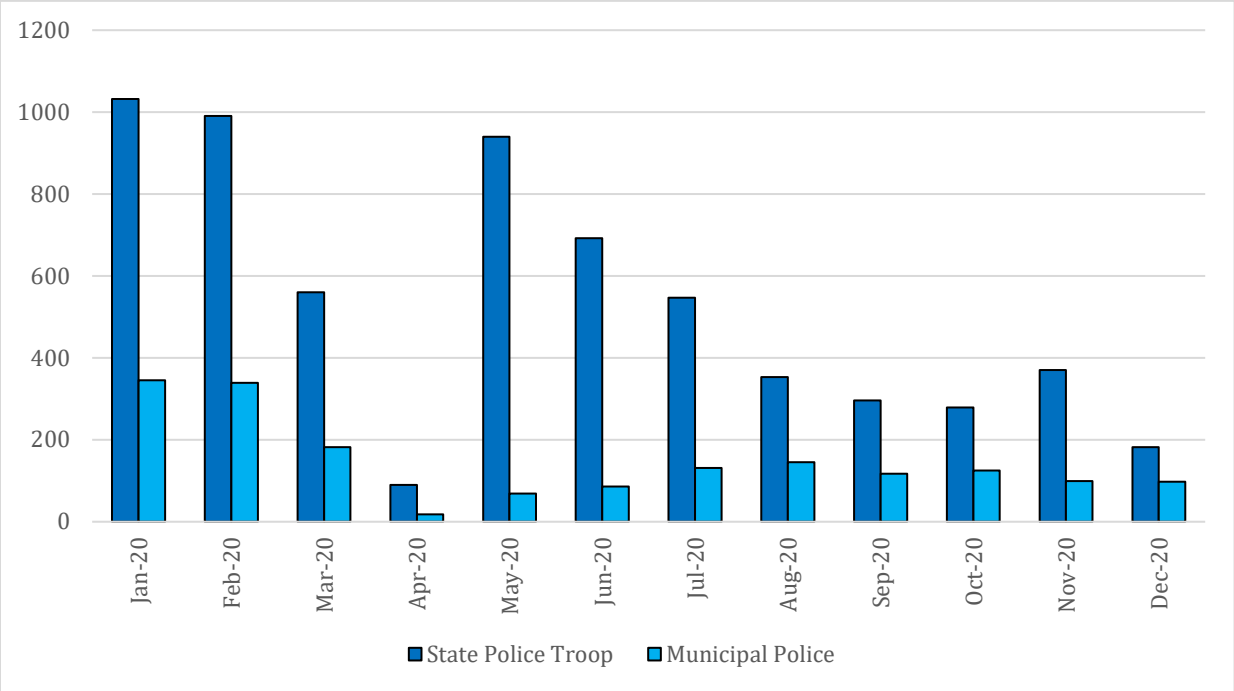


Figure 2.3 illustrates the average number of traffic stops by month for municipal police agencies and the state police. The data again illustrates the significant impact COVID-19 had on overall enforcement levels for both the state police and municipal police departments. Municipal police departments averaged 342 traffic stops each in the first two months of 2020. From March 2020 through December 2020, municipal police departments averaged only 107 stops per month. It is important to note that municipal police departments only averaged 18 stops in April 2020. State police traffic stops also varied greatly throughout the calendar year. Each troop averaged over 1,000 stops in January and February 2020. Between March and December, state police averaged 431 stops per month for each troop. Interestingly, May 2020 saw a temporary, but significant increase in traffic enforcement by State Police.

Figure 2.3: Average Number of Traffic Stops by Month for Police Agencies



The level of and reason for traffic stop enforcement varies greatly across agencies throughout the state for a number of reasons. For example, some enforcement is targeted to prevent traffic crashes in dangerous areas, combat increased criminal activity, or respond to complaints from citizens. Those agencies with active traffic units tend to produce a higher volume of traffic stops. The rate of traffic stops per 1,000 residents in the population helps to compare the stop activity between agencies. The five municipal police agencies with the highest stop rate per 1,000 residents are Windsor, Wilton, New Canaan, Seymour, and Ledyard. Conversely, Shelton, Weston, Granby, Wolcott, and Stratford have the lowest rate of stops per 1,000 residents. Table 2.1 shows the distribution of stops for the highest and lowest level of enforcement per 1,000 residents for police agencies. All department results are contained in the Table B.1 of Appendix B.

Table 2.1: Municipal Police, Highest and Lowest Rates of Traffic Stops

Town Name	16+ Population*	Traffic Stops	Stops per 1,000 Residents
Connecticut	2,825,946	242,382	86
Municipal Departments with the Highest Rate of Traffic Stops			
Windsor	23,222	6,545	282
Wilton	12,973	2,556	197
New Canaan	14,138	2,755	195
Seymour	13,260	2,558	193
Ledyard	11,527	2,012	175
Municipal Departments with the Lowest Rate of Traffic Stops			
Shelton	32,010	184	6
Weston	7,255	86	12
Granby	8,716	118	14
Wolcott	13,175	186	14
Stratford	40,980	772	19

* The population 16 years of age and older was obtained from the United States Census Bureau 2010 Decennial Census.

Table 2.2 presents some basic demographic data on persons stopped in Connecticut between January 1, 2020 and December 31, 2020. Nearly two-thirds (64%) of drivers stopped were male and the vast majority of drivers (87%) were Connecticut residents. Of the stops conducted by police departments other than state police, 91% were Connecticut residents. Of the stops made by state police, 80% were Connecticut residents. About one-third (38%) of drivers stopped were under the age of 30 compared to 24% over 50. The vast majority of stops in Connecticut were White Non-Hispanic drivers (60%); 19% were Black Non-Hispanic drivers; 17% were Hispanic drivers; and 3% were Asian/Pacific Islander Non-Hispanic and American Indian/Alaskan Native Non-Hispanic drivers.

Table 2.2: Statewide Driver Characteristics

Race and Ethnicity		Gender		Residency		Age	
White	60.4%	Male	63.9%	CT Resident	87.1%	16 to 20	9.0%
						21 to 30	28.6%
Black	19.3%					31 to 40	21.9%
						41 to 50	16.2%
Hispanic	17.4%	Female	36.1%	Non-Resident	12.9%	51 to 60	13.9%
						Older than 61	10.3%
Other	2.9%						

Table 2.3 presents data on the characteristics of the traffic stops in the state. Most traffic stops were made for a violation of the motor vehicle laws (88%) as opposed to a stop made for an investigatory purpose or equipment violation. The most common violation drivers were stopped for was speeding (34%). After a driver was stopped, over 34% were given a ticket while most of the remaining drivers received some kind of a warning (57%). Statewide, less than 1 percent of traffic stops resulted in the arrest of a driver and only 3 percent of stops resulted in a search being conducted.

Table 2.3: Statewide Stop Characteristics

Classification of Stop		Basis for Stop	
Motor Vehicle Violation	88.6%	Speeding	33.9%
Equipment Violation	8.8%	Defective Lights	8.9%
Investigatory	2.6%	Misc. Moving Violation	8.2%
Outcome of Stop		Stop Sign	8.2%
Uniform Arrest Report	0.9%	Registration	8.1%
Misdemeanor Summons	6.2%	Traffic Control Signal	6.8%
Infraction Ticket	34.1%	Cell Phone	6.6%
Written Warning	14.4%	STC Violation	6.2%
Verbal Warning	42.6%	Display of Plates	3.0%
No Disposition	1.6%	Seatbelt	1.2%
Vehicles Searched	3.4%	All Other	8.9%

In addition to the difference in the volume of traffic stops across communities, agencies stopped drivers for a number of different reasons. Police record the statutory reason for stopping a motor vehicle for every stop. Those statutes are then sorted into 15 categories from speeding to registration violation to stop sign violation. For example, all statutory violations that are speed related are categorized as speeding. Although speeding is the most often cited reason for stopping a motor vehicle statewide, the results vary by jurisdiction.

The average municipal police department stops for speeding violations was 32% compared to the state police average of 40%. Due to the nature of state police highway operations, it is reasonable that its average for speeding is higher. In Redding, Weston, Avon, Fairfield, Granby, Portland, Simsbury, Easton, Ledyard, Guilford, Newtown, Cheshire, Windsor, and Ridgefield more than 50% of the traffic stops were for speeding violations. On the other hand, Southern Connecticut State University, State Capitol Police, and Yale University stopped drivers for speeding less than 5% of the time. These three special police agencies have limited jurisdiction and it is reasonable that they are not stopping a high percentage of drivers for speeding violations. Table 2.4 shows the top 10 departments where speeding (as a percentage of all stops) was the most common reason for the traffic stop. All department results are contained in the Table B.2 of Appendix B.

Table 2.4: Highest Speeding Stop Rates across All Departments

Department Name	Total Stops	Speeding Violations
Redding	451	77.2%
Weston	86	76.7%
Avon	818	64.1%
CSP Headquarters	9,583	63.7%
Fairfield	4,261	59.1%
Granby	118	58.5%

Department Name	Total Stops	Speeding Violations
Portland	200	57.0%
Simsbury	2,045	56.0%
Easton	497	55.9%
Ledyard	2,012	55.2%

Registration violations have been cited as a low discretion reason for stopping a motor vehicle, particularly due to the increased use of license plate readers to detect registration violations. Statewide, 8.1% of all traffic stops are for a registration violation. Table 2.5 presents the top 10 departments with the highest percentage of stops for registration violations. All department results are contained in the Table B.2 of Appendix B.

Table 2.5: Highest Registration Violation Rates across All Departments

Department Name	Total Stops	Registration Violations
North Branford	249	45.4%
Woodbridge	139	33.8%
Southern CT State University	25	24.0%
Branford	1,416	20.9%
Waterbury	1,808	20.6%
Ridgefield	2,041	20.3%
Shelton	184	19.6%
West Haven	2,738	18.3%
Farmington	2,045	18.1%
Easton	497	17.5%

The Connecticut Department of Transportation and the National Highway Safety Administration work together every year to fund a variety of different driver safety campaigns. Some of the campaigns that we are most familiar with include: “Click it or Ticket,” “Drive Sober or get Pulled Over,” and “Move Over.” Each year law enforcement agencies receive federal grants to fund targeted traffic safety campaigns. Prior to 2020, there had been an increase in federal funding for distracted driver campaigns. Unfortunately, due to the COVID-19 pandemic, many departments were unable to participate in these campaigns during the 2020 calendar year. That being said, stops as the result of a cell phone violation was still a substantial reason for stopping a driver. Statewide, 7% of all stops were the result of a cell phone violation and this rate varies across departments. Table 2.6 presents the top 10 departments with the highest percentage of stops for cell phone violations. All department results are contained in the Table B.2 of Appendix B.

Table 2.6: Highest Cell Phone Violation Rates across All Departments

Department Name	Total Stops	Cell Phone Violations
Canton	915	29.7%
Danbury	3,437	27.9%
Putnam	233	27.5%
Stamford	4,221	25.2%
Norwalk	1,890	24.9%
East Windsor	984	22.6%
Wolcott	186	18.8%
Bridgeport	3,810	18.4%

Department Name	Total Stops	Cell Phone Violations
Berlin	1,902	17.2%
Bethel	2,281	17.0%

Some Connecticut residents have expressed concern about the stops made for violations that are perceived as more discretionary in nature; therefore, potentially making the driver more susceptible to possible police bias. Those stops are typically referred to as pretext stops and might include stops for defective lights, excessive window tint, or a display of plate violation each of which, though a possible violation of state law, leaves the police officer with considerable discretion with respect to actually making the stop. A statewide combined average for stopping drivers for any of these violations is 13%. Fifty-seven municipal police departments and four special police agencies exceeded that statewide average. The departments with the highest percentage of stops conducted for these violations are State Capitol Police (50%), Plymouth (33%), East Windsor (33%), University of Connecticut (32%), Plainfield (32%), Seymour (28%), Clinton (28%), Torrington (27%), South Windsor (27%), and Derby (24%).

In communities with a larger proportion of stops due to these violations, it is recommended that the departments be proactive in discussing the reasons for these stops with members of the community and examine for themselves whether or not such stops produce disparate enforcement patterns.

Many have argued that it is difficult for police to determine the defining characteristics about a driver prior to stopping and approaching the vehicle. Similar to variations found across departments for the reason for the traffic stop, there are variations that occur with the outcome of the stop. These variations illustrate the influence that local police departments have on the enforcement of state traffic laws. Some communities may view infraction tickets as the best method to increase traffic safety, while others may consider warnings to be more effective. This analysis should help police departments and local communities understand their level and type of traffic enforcement when compared to other communities.

Approximately one-third (34%) of drivers stopped in Connecticut received an infraction ticket, while 57% received either a written or verbal warning. Individual jurisdictions varied in their post-stop enforcement actions. Groton Long Point issued infraction tickets in 73% of all traffic stops, although they only made 11 stops in 2020. Danbury issued infraction tickets in 54% of all traffic stops, which is one of the highest in the state. Thomaston only issued infraction tickets in 3% of all traffic stops, which is the lowest rate in the state. For state police, officers not assigned to a troop issued the highest infractions (83%) and Troop B issued the lowest number of infractions (43%). Table 2.7 presents the highest infraction rates across all departments. All department results are contained in the Table B.3 of Appendix B.

Table 2.7: Highest Infraction Rates across All Departments

Department Name	Total Stops	Infraction Ticket
Highest Municipal Departments		
Groton Long Point	11	72.7%
Danbury	3,437	53.9%
Waterbury	1,808	47.0%
Stamford	4,221	46.2%
Hartford	12,612	43.8%

Department Name	Total Stops	Infraction Ticket
East Hartford	4,241	42.7%
Plainville	1,749	42.0%
North Branford	249	41.8%
West Hartford	2,857	39.4%
New Haven	5,964	37.5%
Highest State Police Troops		
CSP Headquarters	9,583	83.4%
Troop G	8,877	70.2%
Troop I	5,389	65.6%
Troop D	4,576	64.4%
Troop H	6,090	64.4%

On the other hand, Thomaston issued warnings 93% of the time (the highest rate) and Groton Long Point issued warnings 18% of the time (the lowest rate). For state police, Troop C issued the highest percentage of warnings (45%) and the group of officers not assigned to a troop issued the lowest percentage of warnings (13%). Table 2.8 presents the highest warning rates across all departments. All department results are contained in the Table B.3 of Appendix B.

Table 2.8: Highest Warning Rates across All Departments

Department Name	Total Stops	Resulted in Warning
Highest Municipal Departments		
Thomaston	711	93.2%
Simsbury	2,045	92.7%
Weston	86	91.9%
Portland	200	91.5%
Redding	451	91.1%
Windsor	6,545	90.8%
Putnam	233	90.6%
Brookfield	598	88.8%
Bethel	2,281	88.3%
Seymour	2,558	88.1%
Highest State Police Troops		
Troop C	7,369	44.9%
Troop L	3,916	44.1%
Troop B	2,422	42.3%
Troop A	8,041	41.5%
Troop K	4,711	41.4%

Statewide, less than 1% of all traffic stops resulted in the driver being arrested. As with infraction tickets and warnings, municipal departments varied in the percentage of arrests associated with traffic stops. The Clinton Police Department issued the most uniform arrest reports from a traffic stop, with 4.3% of all stops resulting in an arrest. Only six municipal police departments arrested more than 3% of all drivers stopped. The variation in arrest rates for state police is much smaller across troop levels. Table 2.9 presents the highest arrest rates across all departments. All department results are contained in the Table B.3 of Appendix B.

Table 2.9: Highest Arrest Rates across All Departments

Department Name	Total Stops	Arrests
Clinton	821	4.3%
Groton Town	2,447	3.4%
Vernon	1,317	3.3%
Naugatuck	4,007	3.2%
New London	1,522	3.1%
West Hartford	2,857	3.1%
Willimantic	1,451	2.8%
New Britain	2,330	2.7%
Wallingford	3,826	2.6%
Meriden	1,956	2.6%

Rarely do traffic stops in Connecticut result in a vehicle being searched. During the study period, only 3.4% of all traffic stops resulted in a search. Although searches are rare in Connecticut, they do vary across jurisdictions and the data provides information about enforcement activity throughout the state. When they search a vehicle, officers must report the supporting legal authority, and whether contraband was found. Forty-two departments exceeded the statewide average for searches, but the largest disparity was found in Waterbury (19%), Derby (15%), Stratford (14%), Vernon (12%), and Naugatuck (12%). Of the remaining departments, 22 searched vehicles more than 5% of the time, 13 searched vehicles between 3.4% and 5% of the time, and the remaining departments searched vehicles less than 3.4% of the time. No State Police Troops exceeded the statewide average for stops resulting in a search. Table 10 presents the highest search rates across all municipal departments. All department results are contained in the Table B.4 of Appendix B.

Table 2.10: Highest Searches Rates across All Departments

Department Name	Total Stops	Resulted in Search
Highest Municipal Departments		
Waterbury	1,808	18.6%
Derby	428	15.0%
Stratford	772	14.2%
Vernon	1,317	12.0%
Naugatuck	4,007	11.6%
New Britain	2,330	11.1%
Clinton	821	10.8%
Norwich	1,756	9.7%
Meriden	1,956	9.5%
Bridgeport	3,810	9.3%

III: ANALYSIS OF TRAFFIC STOPS, VEIL OF DARKNESS

The Veil of Darkness analysis relies on seasonal variation in the timing off sunset to test for evidence of racial and ethnic disparities in police traffic stops. The test operates under the key assumption that police officers are marginally better able to observe the race and ethnicity of motorists during daylight relative to darkness (Grogger and Ridgeway 2006; Ridgeway 2009; Horace and Rohlin 2018; Kalinowski et al. 2017, 2019a, 2019b).[4] The test relies on seasonal variation in the timing of sunset as well as the discrete daylight savings time shift to compare stops made at the same time in darkness versus daylight. The advantage of this methodology, relative to population-based benchmarks, is that it does not require any assumptions about the underlying risk-set of motorists on the roadway. Rather, the test presumes that the composition of motorists does not vary in response to changes to visibility.[5] Within a fixed window when the timing of sunset varies throughout the year, the racial composition of stops in darkness is used as a counterfactual for stops in daylight, i.e. when officers can better observe the race of the motorist.

More specifically, the Veil of Darkness test evaluates whether statistically significant disparities exist in the likelihood that a stopped motorist is a minority during daylight relative to darkness. As detailed explicitly in Appendix A.2, Grogger and Ridgeway (2006) illustrate that under certain conditions the odds-ratio of a stopped motorist being a minority in daylight vs. darkness is equivalent to the odds-ratio that a minority motorist is stopped during daylight vs. darkness. In a practical context, these assumptions are that variation in travel and enforcement patterns (abject of discrimination) do not change differentially by race in response to daylight. To ensure that these conditions are met, the estimates condition on time and day of the week. To further control for inherent differences in daylight and darkness, the sample is restricted to the inter-twilight window, a period of time during the day when solar visibility varies throughout the year (i.e. between the earliest eastern sunset and the latest western end to civil twilight). Conveniently, this window of time falls within the evening commute where we might expect the risk-set of motorists to be less susceptible to seasonal variation.

III.A: AGGREGATE ANALYSIS WITH VEIL OF DARKNESS, 2020 AND 2018-20

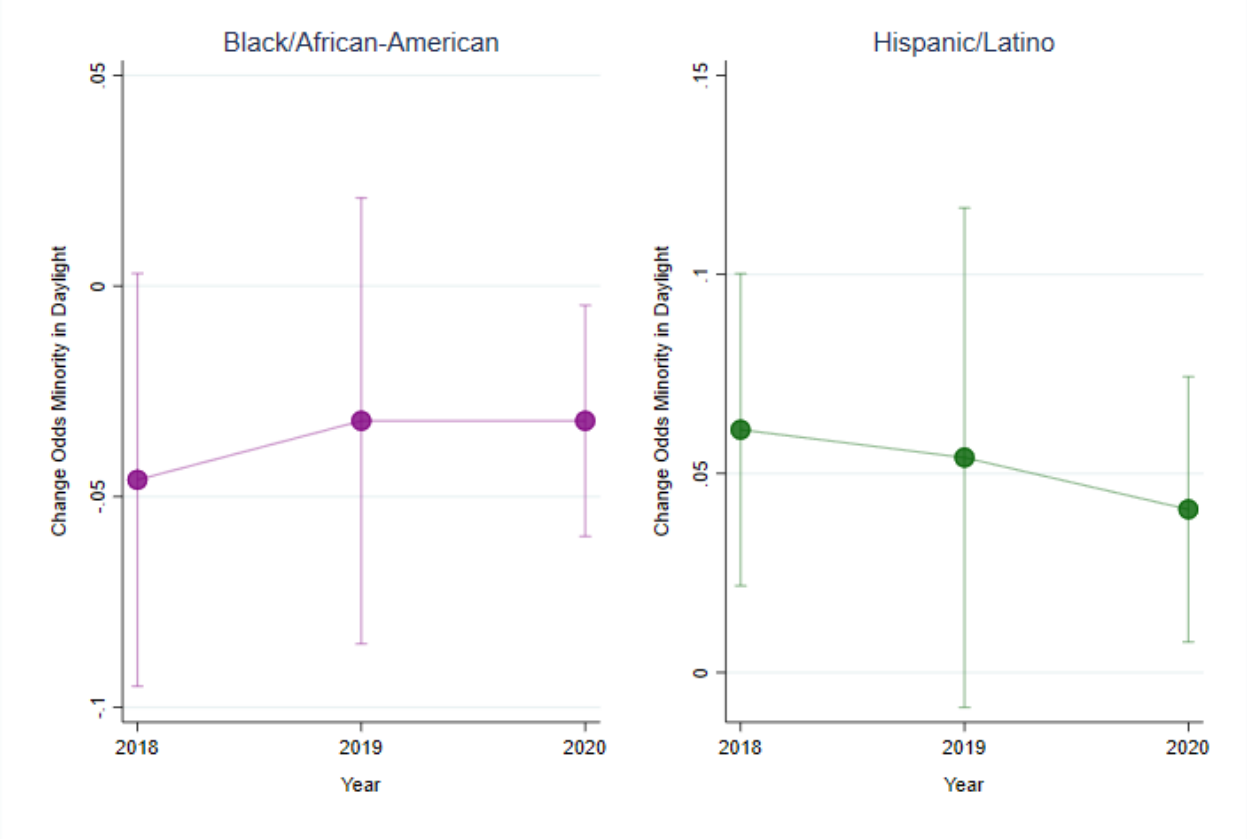
Figure 3.1 presents the results from applying the veil of darkness test to the aggregate sample of traffic stops made within the inter-twilight sample in Connecticut in 2018, 2019, and 2020. The vertical axis on the figure plots a 95% confidence interval around the coefficient estimate of a logistic regression of motorist race/ethnicity on daylight and includes controls for time of day, day of week, and department. The figure plots the estimated change in the odds that a Black (left panel) or Hispanic (right panel) motorist is stopped in daylight relative to darkness. Under the assumptions of this test, an increase in the odds that a minority motorist is represented in the traffic stop data during

[4] Applications of the so-called "Veil of Darkness" method include: Grogger and Ridgeway (2006) in Oakland, CA; Ridgeway (2009) in Cincinnati, OH; Ritter and Bael (2009) and Ritter (2017) in Minneapolis, MN; Worden et al. (2010; 2012) in Syracuse, NY while Horace and Rohlin (2016) in Syracuse, NY; Renauer et al. (2009) in Portland, OR; Taniguchi et al. (2016a, 2016b, 2016c, 2016d) in Durham, Greensboro, Raleigh, and Fayetteville; Masher (2016) in New Orleans, LA; Chanin et al. (2016) in San Diego, CA; Ross et al. (2015; 2016; 2017a; 2017b) in Connecticut and Connecticut; Criminal Justice Policy Research Institute (2017) in Corvallis PD, OR; Milyo (2017) in Columbia, MO; Smith et al. (2017) in San Jose, CA; and Wallace et al. (2017) in Maricopa, AZ.

[5] Note that this assumption allows for differential rates of traffic stops to exist across races and the potential for differences in guilt and driving behavior.

daylight is suggestive of potential adverse treatment on the part of police. Across the period 2018-20, the likelihood a stopped motorist was Black or Hispanic within the inter-twilight window averaged 18.08% and 15.61% respectively as compared to 75.03% non-Hispanic Caucasian. Exponentiating the coefficient estimates from below, we find that the annual estimated change in the odds a Black or Hispanic motorist is stopped in daylight relative to darkness ranged from a factor of 0.96 to 0.97 and 1.04 to 1.06 respectively. According to this test, Hispanic motorists were more likely to be stopped by Connecticut police during daylight relative to darkness in 2020 but Black motorists were marginally less likely to be stopped. Kalinowski et al. (2021) suggest that a statistically significant finding of "reverse discrimination" (i.e. a disparity for White non-Hispanic motorists) may also be consistent with bias against minorities if they are adjusting their driving behavior to avoid detection by police during daylight.

Figure 3.1: Aggregate VOD Analysis by Year, All Traffic Stops 2018-20



Notes: Coefficient estimates are obtained from Table 3.1 of the 2018 and 2019 annual report as well as the 2020 estimates from the table below.

Table 3.1 presents the comprehensive set of results from the 2020 veil of darkness test applied to the aggregate sample of traffic stops made by all Connecticut police departments within the inter-twilight window. The results were obtained by estimating Equation 4 of Appendix A.2 with the standard errors clustered by department. The estimates include controls for the hour, day of week, and department. The estimates rely on four minority definitions which are not mutually exclusive, e.g. the first specification includes all non-Caucasian motorists (regardless of ethnicity) while the third includes all Hispanic motorists (regardless of race). The second specification is restricted to only Black motorists (regardless of ethnicity, i.e. a subset of the first specification) and the fourth

specification which includes both Black and Hispanic motorists (i.e. combines the second and third specifications). The omitted control group across all specifications include only stops made of motorists who were observed to be Caucasian and non-Hispanics. Note that the results for the Black and Hispanic alone categories are also portrayed graphically in Figure 3.1.

The coefficient estimates across all categories in Table 3.1 are relatively inconsistent in terms of sign and statistical significance across specifications. Under the identifying assumptions of this test, see Appendix A.2, we should expect that there will be a direct correspondence between changes to the odds for stopped motorists and that of motorists at risk of being stopped. Thus, a positive change in the odds that a minority motorist is stopped during daylight is indicative of discrimination under the premise that all else is held fixed and the only thing changing is the officer's ability to perceive race. In the aggregate, the results below suggest that Hispanic motorists were more likely to be stopped by police during daylight when their race is more easily observed. However, Black motorists were found to actually be less likely to be stopped by police during daylight in 2020. As noted above, Kalinowski et al. (2021) suggest that a statistically significant finding of "reverse discrimination" may actually be indicative of real or perceived bias against minorities if they change their driving behavior during daylight because they expect to be more easily observed by police. Thus, it is difficult to interpret the results for Black motorists without further data on accident rates or the speed of stopped motorists (both tickets and warnings). Note again that these estimates represent an aggregate statewide estimate across all departments and State Police troops in the state.

Table 3.1: Logistic Regression of Race/Ethnicity on Daylight with Department Fixed-Effects, All Traffic Stops 2020

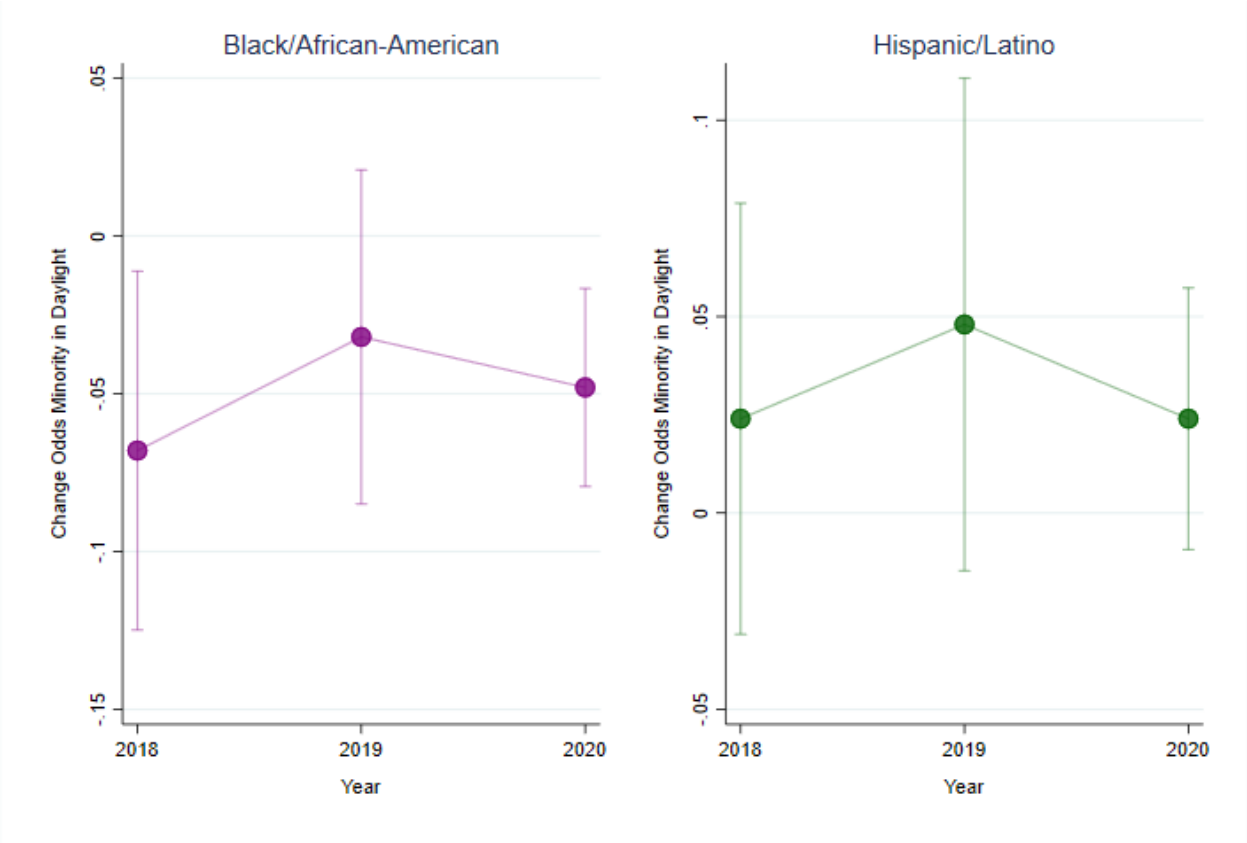
LHS: Minority Status		Non-Caucasian	Black	Hispanic	Black or Hispanic
Daylight	Coefficient	-0.039***	-0.032**	0.041**	0.004
	Standard Error	(0.013)	(0.014)	(0.017)	(0.014)
Sample Size		104,192	259384	249675	242079
Pseudo R^2		0.151	0.143	0.173	0.114

Note 1: The coefficients are presented as log odds-ratios along with standard errors clustered at the department level. A coefficient concatenated with * represents a p-value of .1, ** represents a p-value of .05, and *** represents a p-value of .01 significance.
Note 2: All specifications include controls for time of the day, day of the week, analysis year, and department fixed-effects.
Note 3: Sample includes all traffic stops made during the inter-twilight window in 2020.

Figure 3.2 presents the results from the veil of darkness test applied to the combined sample of municipal departments from 2018, 2019, and 2020. As before, the vertical axis on the figure plots a 95% confidence interval around the coefficient estimate of a logistic regression of motorist race/ethnicity on daylight and controls for time of day, day of week, and department. A positive coefficient represents an increase in the odds a minority motorist was represented in the traffic stop data during daylight which is suggestive of potential adverse treatment on the part of police. Across the period 2018-20, the likelihood a stopped motorist was Black or Hispanic within the inter-twilight window averaged 19.94% and 16.57% respectively as compared to 72.9% non-Hispanic Caucasian. Exponentiating the coefficient estimates from below, we find that the annual estimated change in the odds a Black motorist is stopped in daylight ranged from a factor of 0.93 to 0.97. The difference in the likelihood of being stopped was negative and statistically significant in both 2018 and 2020 which may or may not be indicative of a potential disparity. The change in the odds a Hispanic motorist is stopped in daylight relative to darkness ranged from a factor of 1.02 in 2018 to 1.05 in 2020 and were statistically insignificant in all years. According to this test, on average, there are no measurable

differences in the likelihood a Hispanic motorist is stopped by municipal police in Connecticut during daylight relative to darkness in 2020.

Figure 3.2: Aggregate VOD Analysis by Year, Municipal Traffic Stops 2018-20



Notes: Coefficient estimates are obtained from Table 3.2 of the 2018 and 2019 annual report as well as the 2020 estimates from the table below.

Table 3.2 presents the full set of results estimated from the sample of all municipal police departments during the inter-twilight window in 2020. As discussed above with respect to Figure 3.2, we find very little evidence of a statistically significant disparity for minority motorists in the combined sample of municipal police departments with the exception of Black motorists but those results are largely inconclusive. Under the identifying assumptions of this test, see Appendix A.2, we should expect that there will be a direct correspondence between changes to the odds for stopped motorists and that of motorists at risk of being stopped. Thus, a positive change in the odds that a minority motorist is stopped during daylight is typically considered to be indicative of discrimination. In the aggregate, the results below do not consistently show any disparity in terms of the likelihood that minority motorists are stopped by Connecticut municipal police during daylight relative to darkness. The exception to this is with respect to Black motorists which appear to have been less likely to be stopped by municipal police in 2020 which may or may not be indicative of a disparity.

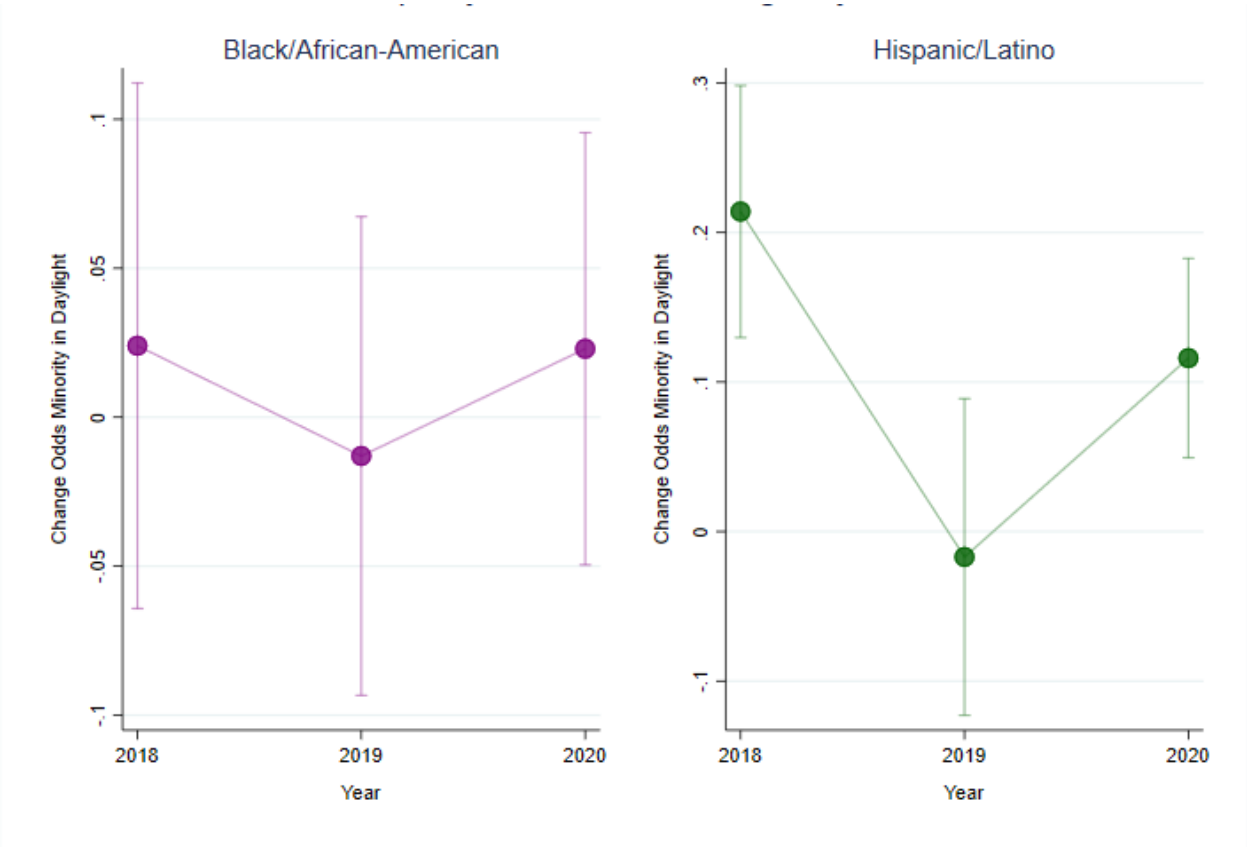
Table 3.2: Logistic Regression of Race/Ethnicity on Daylight, Municipal Traffic Stops 2020

LHS: Minority Status		Non-Caucasian	Black	Hispanic	Black or Hispanic
Daylight	Coefficient	-0.054***	-0.048***	0.024	-0.014
	Standard Error	(0.014)	(0.016)	(0.017)	(0.013)
Sample Size		189029	182763	175153	219084
Pseudo R^2		0.163	0.189	0.126	0.156

Note 1: The coefficients are presented as log odds-ratios along with standard errors clustered at the department level. A coefficient concatenated with * represents a p-value of .1, ** represents a p-value of .05, and *** represents a p-value of .01 significance.
Note 2: All specifications include controls for time of the day, day of the week, analysis year, and department fixed-effects.
Note 3: Sample includes all traffic stops made during the inter-twilight window in 2020.

Figure 3.3 presents the results from the veil of darkness test applied to the combined sample of State Police departments from 2018, 2019, and 2020. As before, the vertical axis on the figure plots a 95% confidence interval around the coefficient estimate of a logistic regression of motorist race/ethnicity on daylight and controls for time of day, day of week, and department. A positive coefficient represents an increase in the odds a minority motorist was represented in the traffic stop data during daylight which is suggestive of potential adverse treatment on the part of police. Across the period 2018-20, the likelihood a stopped motorist was Black or Hispanic within the inter-twilight window averaged 12.52% and 12.8% respectively as compared to 81.37% non-Hispanic Caucasian. Exponentiating the coefficient estimates from below, we find that the annual estimated change in the odds a Black motorist is stopped in daylight ranged from a factor of 0.99 to 1.02 from 2018-20. These differences were statistically insignificant in all years. The change in the odds a Hispanic motorist is stopped in daylight relative to darkness ranged from a factor of 0.98 to 1.24 from 2018-20. The difference in the likelihood of being stopped was positive and statistically insignificant in all years except 2018 and 2020 for Hispanic motorists.

Figure 3.3: Aggregate VOD Analysis by Year, State Police Traffic Stops 2018-20



Notes: Coefficient estimates are obtained from Table 3.3 of the 2018 and 2019 annual report as well as the 2020 estimates from the table below.

Table 3.3 presents the full set of results estimated from the sample of all State Police departments during the inter-twilight window in 2020. As discussed above with respect to Figure 3.3, we find evidence of a statistically significant disparity against Hispanic motorists in 2020 for the combined sample of Connecticut State Police. Under the identifying assumptions of this test, see Appendix A.2, we should expect that there will be a direct correspondence between changes to the odds for stopped motorists and that of motorists at risk of being stopped. Thus, a positive change in the odds that a minority motorist is stopped during daylight is indicative of discrimination. In the aggregate, the results below show a disparity in terms of the likelihood that a Hispanic motorist is stopped by Connecticut State Police during daylight relative to darkness.

Table 3.3: Logistic Regression of Race/Ethnicity on Daylight, State Police Traffic Stops 2020

LHS: Minority Status		Non-Caucasian	Black	Hispanic	Black or Hispanic
Daylight	Coefficient	0.017	0.023	0.116***	0.071**
	Standard Error	(0.030)	(0.037)	(0.034)	(0.028)
Sample Size		67349	64132	64345	73519
Pseudo R^2		0.061	0.078	0.061	0.075

Note 1: The coefficients are presented as log odds-ratios along with standard errors clustered at the department level. A coefficient concatenated with * represents a p-value of .1, ** represents a p-value of .05, and *** represents a p-value of .01 significance.

Note 2: All specifications include controls for time of the day, day of the week, analysis year, and department fixed-effects.
Note 3: Sample includes all traffic stops made during the inter-twilight window in 2020.

As mentioned, the prior set of results aggregate all traffic stops across multiple departments and should be considered an average treatment effect estimated from quasi-random variation in the timing of sunset. Although the results from this section indicate a statistically significant disparity in the rate of minority traffic stops, they do not identify the specific underlying department(s) that are potentially driving the disparity. Note that the findings of this test pertain exclusively to the inter-twilight window and cannot be generalized to other times of the day when different officers might be on duty or different enforcement activities are taking place. The results of a department-level analysis are presented in a later section and allow us to better identify specific sources of the overall disparity identified in this section. The next section provides an additional set of robustness checks using a select sample of moving violations. As will be discussed subsequently, these robustness checks are necessary because certain types of violations (e.g. headlight, seatbelt, and cell phone) may be correlated with daylight/darkness and race/ethnicity. As a result of the strong possibility that this correlation exists in the data and including these types of stops could potentially bias the coefficient estimates towards zero. Thus, including these stops would make it less likely that we might detect discrimination even when it exists.

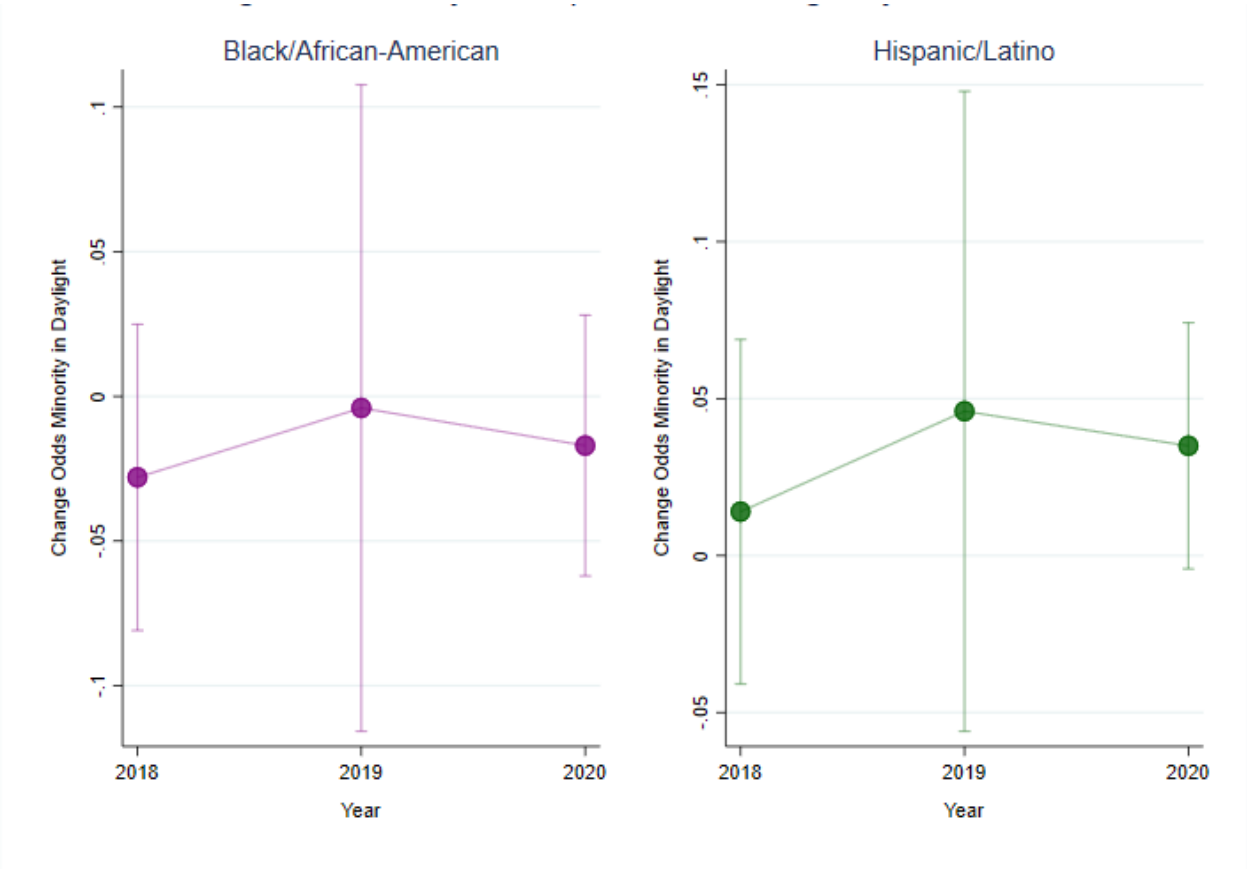
III.B: AGGREGATE ROBUSTNESS CHECKS WITH VEIL OF DARKNESS, 2020 AND 2018-20

This section presents a robustness check on the initial specification using a more restrictive subsample of only moving violations. As mentioned, an analysis using all violations is potentially biased against finding discrimination because specific types of violations are likely to be correlated with daylight/darkness and race/ethnicity. For example, imagine that minority motorists are more likely to have a broken headlight and that these violations are only observable and enforced by police during darkness. In that instance, comingling equipment violations with moving violations might make it likely that more minorities are stopped at night relative to a sample of only moving violations. Thus, these types of violations might have a large enough effect to bias the test statistic towards zero even in the presence of discrimination. In contrast, one might also imagine that cellphone and seatbelt violations have the potential to bias the results upward if they are only observable to police in daylight and also correlated with race/ethnicity. Since both scenarios seem reasonable and the net-effect of the two sources of bias is impossible to quantify, a natural robustness check on our initial findings is to simply limit the estimation sample to only moving violations.

Figure 3.4 presents the results from the solar visibility test applied to the subsample of moving violation made by all policing agencies within the inter-twilight window from the last three annual reports in 2018, 2019, and 2020. As before, the vertical axis on the figure plots a 95% confidence interval around the coefficient estimate of a logistic regression of motorist race/ethnicity on daylight as well as controls for time of day, day of week, and department. A positive coefficient indicates an increase in the odds a minority motorist was represented in the traffic stop data during daylight which is suggestive of potential adverse treatment on the part of police. Across the period 2018-20, the likelihood a stopped motorist was Black or Hispanic within the inter-twilight window averaged 15.61% and 13.12% respectively as compared to 77.93% non-Hispanic Caucasian. Exponentiating the coefficient estimates from below, the annual estimated change in the odds a Black motorist is stopped in daylight ranged from a factor of 0.97 to 1.00 but was statistically insignificant in all years.

The change in the odds a Hispanic motorist is stopped in daylight relative to darkness ranged from a factor of 1.01 to 1.05 but was statistically insignificant in all years. In the aggregate, the results below do not consistently show any disparity in terms of the likelihood that minority motorists are stopped by Connecticut police during daylight relative to darkness.

Figure 3.4: Aggregate VOD Analysis by Year, All Moving Violations 2018-20



Notes: Coefficient estimates are obtained from Table 3.4 of the 2018 and 2019 annual report as well as the 2020 estimates from the table below.

Table 3.4 presents the aggregate results estimated from the subsample of moving violations made by all departments during the inter-twilight window in 2020. As before, these results were estimated with the standard errors clustered by department and include controls for the hour, day of the week, and department. Relative to Table 3.1, the results are only marginally significant for Hispanic motorists with the additional sample restriction. In general, these results suggest that our prior set of results using the full sample were not driven by a correlation between race, visibility, and specific types of enforcement. In the aggregate, the results below do show a disparity in terms of the likelihood that a Hispanic motorist is stopped by Connecticut police in daylight relative to darkness.

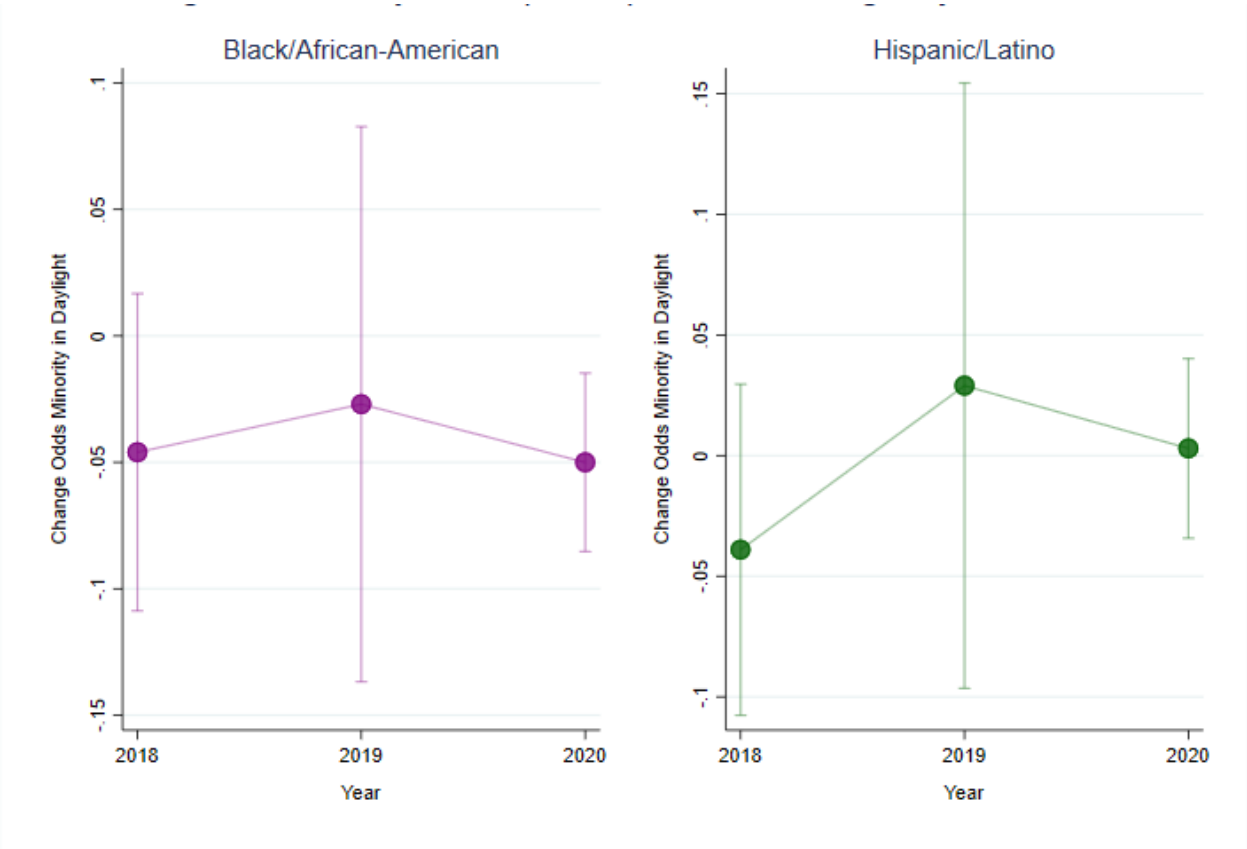
Table 3.4: Logistic Regression of Race/Ethnicity on Daylight with Department Fixed-Effects, All Moving Violations 2020

LHS: Minority Status		Non-Caucasian	Black	Hispanic	Black or Hispanic
Daylight	Coefficient	-0.004	-0.017	0.035*	0.009
	Standard Error	(0.021)	(0.023)	(0.020)	(0.018)
Sample Size		148157	141880	137627	163391
Pseudo R^2		0.133	0.167	0.101	0.136

Notes: The coefficients are presented as log odds-ratios along with standard errors clustered at the department level. A coefficient concatenated with * represents a p-value of .1, ** represents a p-value of .05, and *** represents a p-value of .01 significance. All specifications include controls for hour, day of the week, and department fixed effects. Sample includes all moving violations made during the inter-twilight window in 2020.

Figure 3.5 presents the results from the veil of darkness test applied to the subsample of moving violation made by municipal police departments within the inter-twilight window in 2018, 2019, and 2020. As before, the vertical axis on the figure plots a 95% confidence interval around the coefficient estimate of a logistic regression of motorist race/ethnicity on daylight as well as controls for time of day, day of week, and department. A positive coefficient indicates an increase in the odds a minority motorist was represented in the traffic stop data during daylight which is suggestive of potential adverse treatment on the part of police. Across the period 2018-20, the likelihood a stopped motorist was Black or Hispanic within the inter-twilight window averaged 16.99% and 13.85% respectively as compared to 76.65% non-Hispanic Caucasian. Exponentiating the coefficient estimates from below, we find that the annual estimated change in the odds a Black motorist is stopped in daylight ranged from a factor of 0.95 to 0.97 but these differences were statistically insignificant across all years except for 2020 where the coefficient was negative. The change in the odds a Hispanic motorist is stopped in daylight relative to darkness ranged from a factor of 0.96 to 1.03 but were statistically insignificant in all years.

Figure 3.5: Aggregate VOD Analysis by Year, Municipal Moving Violations 2018-20



Notes: Coefficient estimates are obtained from Table 3.5 of the 2018 and 2019 annual report as well as the 2020 estimates from the table below.

Table 3.5 presents the aggregate results estimated from the subsample of moving violations made by municipal police departments during the inter-twilight window in 2020. As before, these results were estimated with the standard errors clustered by the department and include controls for the hour, day of the week, and department. Relative to Table 3.2, the results are mildly attenuate and statistically insignificant. In general, these results suggest that our prior set of results were somewhat driven by a correlation between race, visibility, and specific types of enforcement. The results in both Table 3.2 and Table 3.5 both show that Black motorists are actually less likely to be stopped in daylight relative to darkness by municipal police in Connecticut. As discussed, Kalinowski et al. (2021) suggest that a statistically significant finding of "reverse discrimination" may actually be indicative of real or perceived bias against minorities if they change their driving behavior during daylight because they expect to be more easily observed by police. Thus, it is difficult to interpret the results for Black motorists without further data on accident rates or the speed of stopped motorists (both tickets and warnings).

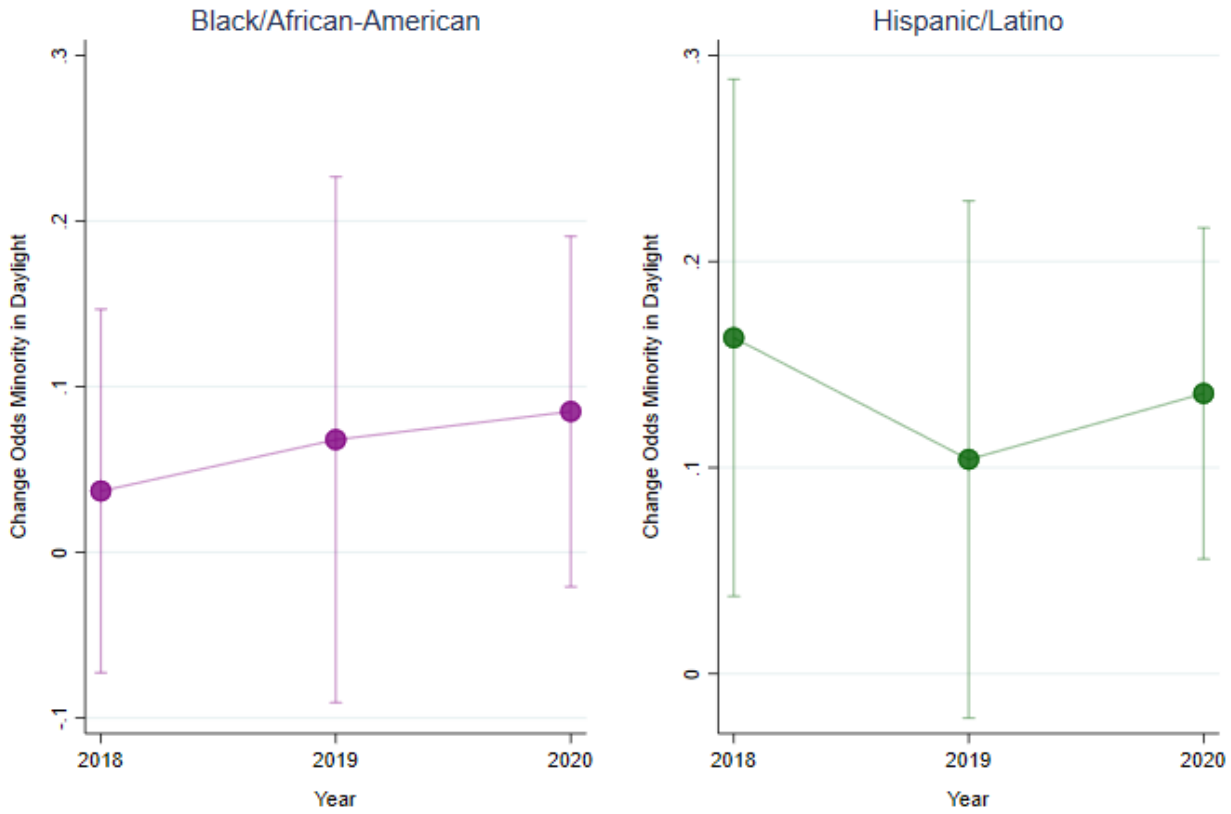
Table 3.5: Logistic Regression of Race/Ethnicity on Daylight, Municipal Moving Violations 2020

LHS: Minority Status		Non-Caucasian	Black	Hispanic	Black or Hispanic
Daylight	Coefficient	-0.041**	-0.050***	0.003	-0.023
	Standard Error	(0.017)	(0.018)	(0.019)	(0.016)
Sample Size		104395	100595	96786	116825
Pseudo R^2		0.160	0.195	0.119	0.158

Notes: The coefficients are presented as log odds-ratios along with standard errors clustered at the department level. A coefficient concatenated with * represents a p-value of .1, ** represents a p-value of .05, and *** represents a p-value of .01 significance. All specifications include controls for hour, day of the week, and department fixed effects. Sample includes all moving violations made during the inter-twilight window in 2020.

Figure 3.6 presents the results from the veil of darkness test applied to the moving violation subsample of all State Police troops in 2018, 2019, and 2020. As before, the vertical axis on the figure plots a 95% confidence interval around the coefficient estimate of a logistic regression of motorist race/ethnicity on daylight as well as controls for time of day, day of week, and department. A positive coefficient indicates an increase in the odds a minority motorist was represented in the traffic stop data during daylight which is suggestive of potential adverse treatment on the part of police. Across the period 2018-20, the likelihood a stopped motorist was Black or Hispanic within the inter-twilight window averaged 11.97% and 11.26% respectively as compared to 81.45% non-Hispanic Caucasian. Exponentiating the coefficient estimates from below, we find that the annual estimated change in the odds a Black motorist is stopped in daylight ranged from a factor of 1.04 to 1.09. The change in the odds a Hispanic motorist is stopped in daylight relative to darkness ranged from a factor of 1.11 to 1.18 but was only statistically significant in 2018 and 2020. In the aggregate, the results below do not consistently show any disparity in terms of the likelihood that minority motorists are stopped by Connecticut State Police during daylight relative to darkness.

Figure 3.6: Aggregate VOD Analysis by Year, State Police Moving Violations 2018-20



Notes: Coefficient estimates are obtained from Table 3.6 of the 2018 and 2019 annual report as well as the 2020 estimates from the table below.

Table 3.6 presents the results from the subsample of moving violations made by State Police during the inter-twilight window in 2020. As discussed above with respect to Figure 3.6, we find evidence of a statistically significant disparity for all minority groupings considered. Under the identifying assumptions of this test, see Appendix A.2, we should expect that there will be a direct correspondence between changes to the odds for stopped motorists and that of motorists at risk of being stopped. Thus, a positive change in the odds that a minority motorist is stopped during daylight is indicative of discrimination. In the aggregate sample of State Police moving violations, we find evidence of a statistically significant disparity in the likelihood of a Hispanic motorist being stopped in daylight relative to darkness in 2020.

Table 3.6: Logistic Regression of Race/Ethnicity on Daylight, State Police Moving Violations 2020

LHS: Minority Status		Non-Caucasian	Black	Hispanic	Black or Hispanic
Daylight	Coefficient	0.097**	0.085	0.136***	0.108***
	Standard Error	(0.043)	(0.054)	(0.041)	(0.039)
Sample Size		42312	39962	39624	45031
Pseudo R^2		0.050	0.065	0.043	0.059

Notes: The coefficients are presented as log odds-ratios along with standard errors clustered at the department level. A coefficient concatenated with * represents a p-value of .1, ** represents a p-value of .05, and *** represents a p-value of .01

significance rate greater than 10% All specifications include controls for hour, day of the week, and department fixed effects. Sample includes all moving violations made during the inter-twilight window in 2020.

The results presented in the state-level analysis provide strong evidence that a disparity exists in the rate at which State Police stopped Hispanic motorists for traffic in 2020. Across the other agencies, we found little evidence of a disparity and in fact some evidence that Black motorists were less likely to be stopped but it is unclear how to interpret those results. Figures 3.1-3.6 indicate that the disparity for both Black and Hispanic motorists is persistent overtime and estimated precisely across most specifications. Although restricting the sample to moving violations slightly attenuated the point estimates and further reduced estimation power across most of the models, we found that the point estimates actually were larger for Hispanic motorists in the moving violation sample for State Police. It bears mentioning that these aggregate results are not necessarily representative of all individual policing agencies or officers within the state and should only be interpreted as an average estimate. In the preceding section, the test will be applied to both individual municipal departments and State Police troops.

III.C: DEPARTMENT ANALYSIS WITH VEIL OF DARKNESS, 2020 AND 2018-20

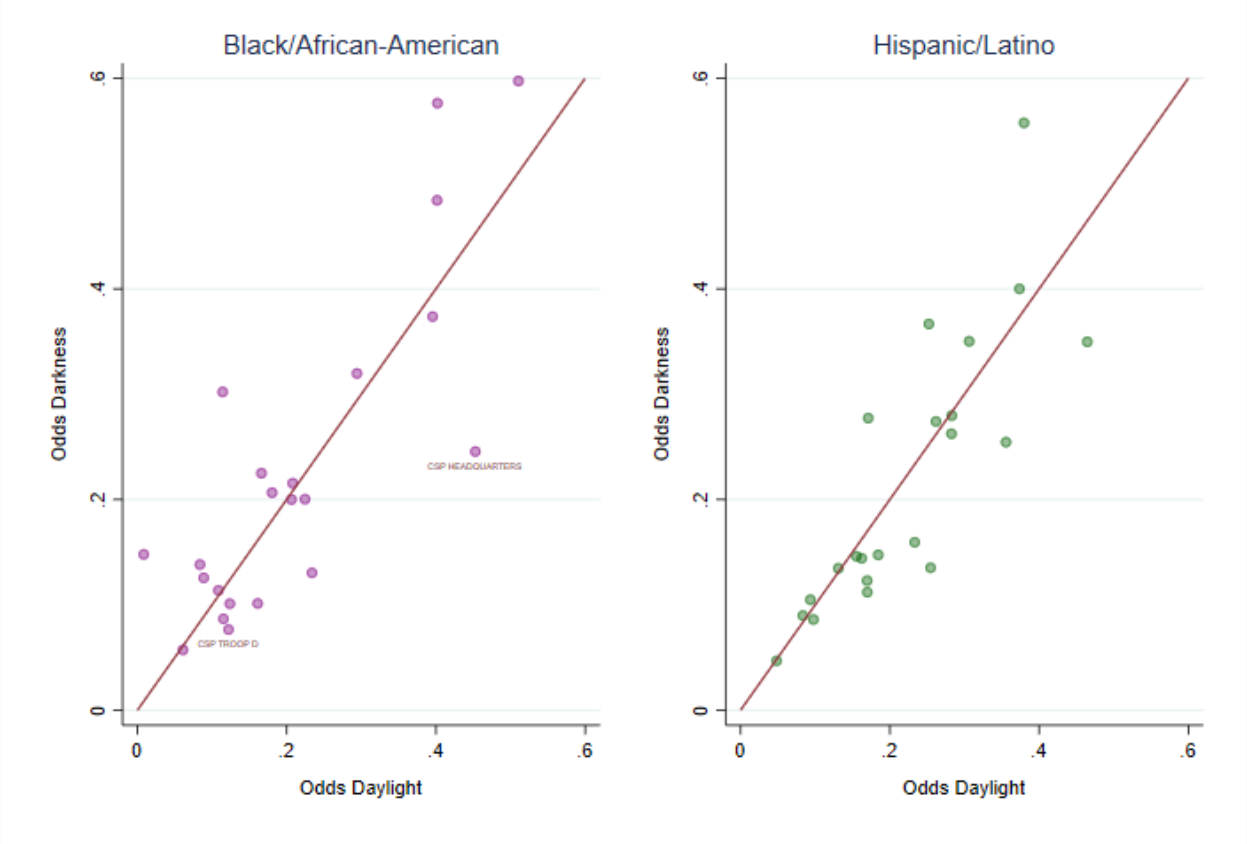
The analysis presented at the state-level shows that the odds a stopped motorist is a minority increases in daylight relative to darkness. As noted in the introduction and detailed in Appendix A.2, we can directly attribute this disparity to a change in the odds that a minority motorist is stopped in daylight relative to darkness under reasonable assumptions about the counterfactual. By construction, the aggregate analysis from Section III.A and III.B does not investigate the source of these disparities in terms of specific municipal police departments or State Police troops. The analysis presented in this section seeks to better identify the sources of that disparity in terms of specific departments and troops by running separate tests for each jurisdiction.

In this section, we graphically present estimate of the veil of darkness test (i.e. Equation 4 of Appendix A.2) separately for each municipal department and State Police troop. We first provide results for the 2020 sample of the data as we have done in the prior three reports. However, we also leverage the full three-year sample from 2018-20 and graphically present estimates of the effect of daylight for smaller departments which previously had an insufficiently small sample to run the test annually. Although restricting the sample of stops to the inter-twilight window is necessary to mitigate the risk of violating the identifying assumptions of the veil of darkness test, it is a relatively onerous sample restriction and significantly reduces the estimation power in small samples. In the figures and discussion below, we highlight only the departments found to have a statistically significant disparity in the Black or Hispanic alone categories for either the 2020 or combined 2018-20 samples. The full results can be found in Table C.7 and C.9 of Appendix C. For both sets of estimates, we calculate robust standard errors and include a vector of controls for hour and day of the week. Identification requires that departments and State Police troops have a disparity that is statistically significant at or above the 95% level in either of the Hispanic or Black alone minority groups. Further, we only highlight departments that withstand the scrutiny of restricting the sample to only moving violations and that have a false discovery rate below 10% in both specifications. We provide the full set of results in Tables C.1 and C.3 and the moving violation robustness tests in C.2 and C.4 of Appendix C.

Figure 3.7 plots the odds a Black (left panel) or Hispanic (right panel) motorist is stopped relative to a non-Hispanic Caucasian motorist in daylight versus darkness by town in 2020. Individual points on the figure represent specific municipal departments and State Police troops. The vertical axis plots

the odds a stopped motorist is a minority in darkness and the horizontal axis plots the same odds in daylight. For ease of presentation in the figure, we approximate the regression results by imposing the coefficient estimate of daylight from Table C.8 of Appendix C on the unadjusted odds a minority motorist is stopped in darkness during the inter-twilight window.[6] The red 45-degree line represents parity (equal treatment) between daylight and darkness amongst minorities and non-Hispanic Caucasians. Thus, only departments falling below this line (bottom right quadrant) are more likely to stop minority motorists during daylight when their race is more easily observed. We annotate only those departments where the difference is statistically significant at or above the 95% confidence level in the overall sample of traffic stops as well as the robustness test using only moving violations. In 2020, we only identify State Police Troop D and Headquarters as having a statistically significant disparity for Black motorists.

Figure 3.7: Veil of Darkness Analysis, All Departments 2020

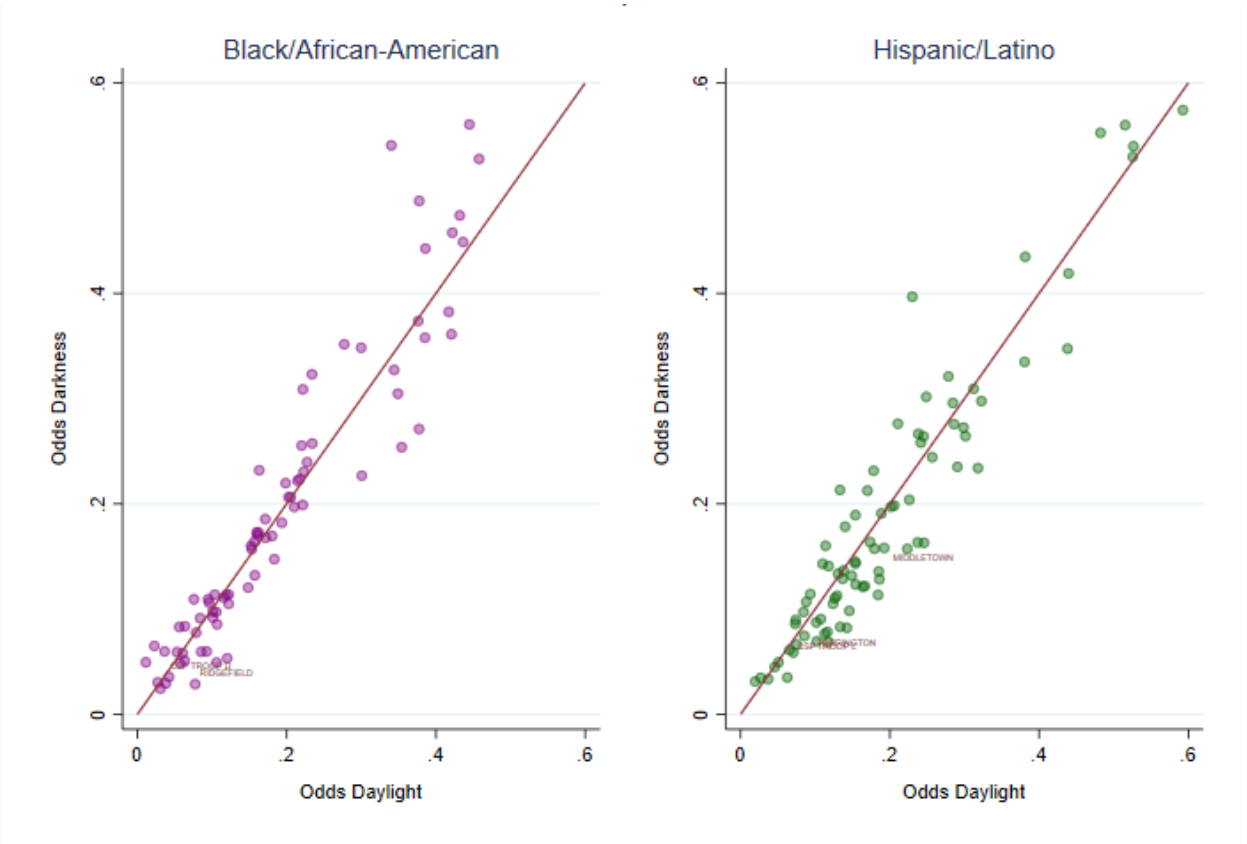


Notes: Coefficient estimates are obtained from Table C.7 of Appendix C, exponentiated and converted into a probability, and then imposed on the likelihood a minority is stopped in darkness for each department. The change in the odds a minority motorist was represented in the traffic stop data is estimated with controls for hour and day of the week. Annotated departments include only those with a statistically significant disparity estimated with a confidence level at or exceeding the 95% in the combined sample of all traffic stops within the inter-twilight window as well as in a robustness check focusing on moving violations (Table C.8 of Appendix C). Identified departments also had a false discovery rate below 10% estimated following Simes (1986), Benjamini and Hochberg (1995), and Benjamini and Yekutieli (2001).

[6] More specifically, the odds of a minority stop in darkness is the uncontrolled raw level rather than the regression adjusted level. We do this for simplicity and ease of exposition.

In order to test for disparities in smaller departments where we are unable to precisely estimate the effect of daylight in the annual report due to an insufficiently small sample within the inter-twilight window, we leverage data from 2018-20. As with the previous figure, Figure 3.8 plots the odds a Black (left panel) or Hispanic (right panel) motorist is stopped relative to a non-Hispanic Caucasian motorist in daylight versus darkness by department in the 2018-20 sample. Individual points on the figure represent specific municipal departments and State Police troops. The vertical axis plots the odds a stopped motorist is a minority in darkness and the horizontal axis plots the same odds in daylight. For ease of presentation in the figure, we approximate the regression results by imposing the coefficient estimate of daylight from Table C.9 of Appendix C on the unadjusted odds a minority motorist is stopped in darkness during the inter-twilight window.[7] The red 45-degree line represents parity (equal treatment) between daylight and darkness amongst minorities and non-Hispanic Caucasians. Thus, only departments falling below this line (bottom right quadrant) are more likely to stop minority motorists during daylight when their race is more easily visible. We annotate only those departments where the difference is statistically significant at or above the 95% confidence level in the overall sample of traffic stops as well as the robustness test using only moving violations. Applying the test to the combined 2018-20 data, we find evidence of a statistically significant disparity in State Police Troop D (Black), State Police Troop L (Hispanic), Middletown (Hispanic), and Ridgefield (Black)

Figure 3.8: Veil of Darkness Analysis, All Departments 2018-20



Notes: Coefficient estimates are obtained from Table C.7 of Appendix C, exponentiated and converted into a probability, and

[7] More specifically, the odds of a minority stop in darkness is the uncontrolled raw level rather than the regression adjusted level. We do this for simplicity and ease of exposition.

then imposed on the likelihood a minority is stopped in darkness for each department. The change in the odds a minority motorist was represented in the traffic stop data is estimated with controls for hour and day of the week. Annotated departments include only those with a statistically significant disparity estimated with a confidence level at or exceeding the 95% in the combined sample of all traffic stops within the inter-twilight window as well as in a robustness check focusing on moving violations (Table C.8 of Appendix C). Identified departments also had a false discovery rate below 10% estimated following Simes (1986), Benjamini and Hochberg (1995), and Benjamini and Yekutieli (2001).

In total, we identify two departments in the 2020 sample and four departments in the 2018-20 sample. For these departments, we conclude that there is strong evidence that a disparity exists in the rate of minority traffic stops made during daylight conditions. State Police Headquarters and Troop H also appeared in the estimates using the subsample of moving violations but not in the main estimate for 2018-20. We also note that all disparities identified in this section are limited to those occurring within a window of time during the evening commute when the timing of sunset varies throughout the year. Although it is impossible to link these observed disparities to racial profiling as the differences could be driven by policing policy or individual bad actors, these results provide strong evidence police in these areas are treating minority motorists differently during daylight.

IV: ANALYSIS OF TRAFFIC STOPS, SYNTHETIC CONTROL

Traditional approaches that rely on population-based benchmarks to evaluate policing data must make a variety of very strong assumptions about the underlying risk-set of motorists. These approaches, despite their flaws, are intuitively appealing because they offer tangible easily interpreted measures of potential discrimination. This section presents the results of a synthetic control analysis that has the same intuition as traditional population-based benchmarks or relative rate/disparity indices but remains grounded in rigorous statistical theory. A synthetic control is a unique benchmark constructed for each department using various stop-specific and town-level demographic characteristics as captured through inverse propensity score weighting. The synthetic control is then used to assess the effect of treatment on an outcome variable(s), in this case the probability that a minority motorist is involved in a police traffic stop.[8]

Put simply, departments differ in terms of their enforcement activity (i.e. timing of stops and types of violations, etc.) and the underlying demographics of the population on the roadway. This analysis accounts for these differences by estimating a measure of similarity called a propensity score. Here, a propensity score is a measure of how similar a stop made outside a given department is to a stop made by the department being analyzed. These measures of similarity are used to weight stops when constructing an individual benchmark for each department. For example, if the department being analyzed has a high minority population and makes most of their stops on Friday nights at 7 PM for speeding violations then stops made for speeding by departments with a similar residential population at this time and day will be given more weight when constructing the benchmark. This methodology ensures that there is an apples-to-apples comparison between the number of minorities stopped in a given town relative to their benchmark and allows for the interpretation of any remaining differences to be attributed to possible disparate treatment.

Weighting the observations by the inverse of the propensity score ensures that the distribution of observable characteristics is consistent between the department of interest and the so-called "synthetic control". As long as these observed variables fully capture selection into treatment, inverse propensity score weighting allows for an unbiased estimate of the effect of treatment on the outcome of interest. In the present context, constructing a synthetic control using inverse propensity score weights allow for an assessment of whether specific departments are disproportionately stopping minority motorists. A detailed description of the mechanics underlining this methodology as well as the current application can be found in Appendix A.3. Generally speaking, the synthetic control approach follows a rich and extensive literature spanning the fields of statistics, economics, and public policy. The application of similar methodologies to policing data has recently entered the criminal justice literature through notable applications by McCaffrey et al. (2004), Ridgeway (2006), and Ridgeway and MacDonald (2009).

[8] In the methodological discussion here and in the appendix, the details of the estimation procedure are presented as if a single treatment effect were estimated using a single outcome variable. However, the estimates were constructed for each municipal department using four different outcome variables for the minority groupings used throughout the report

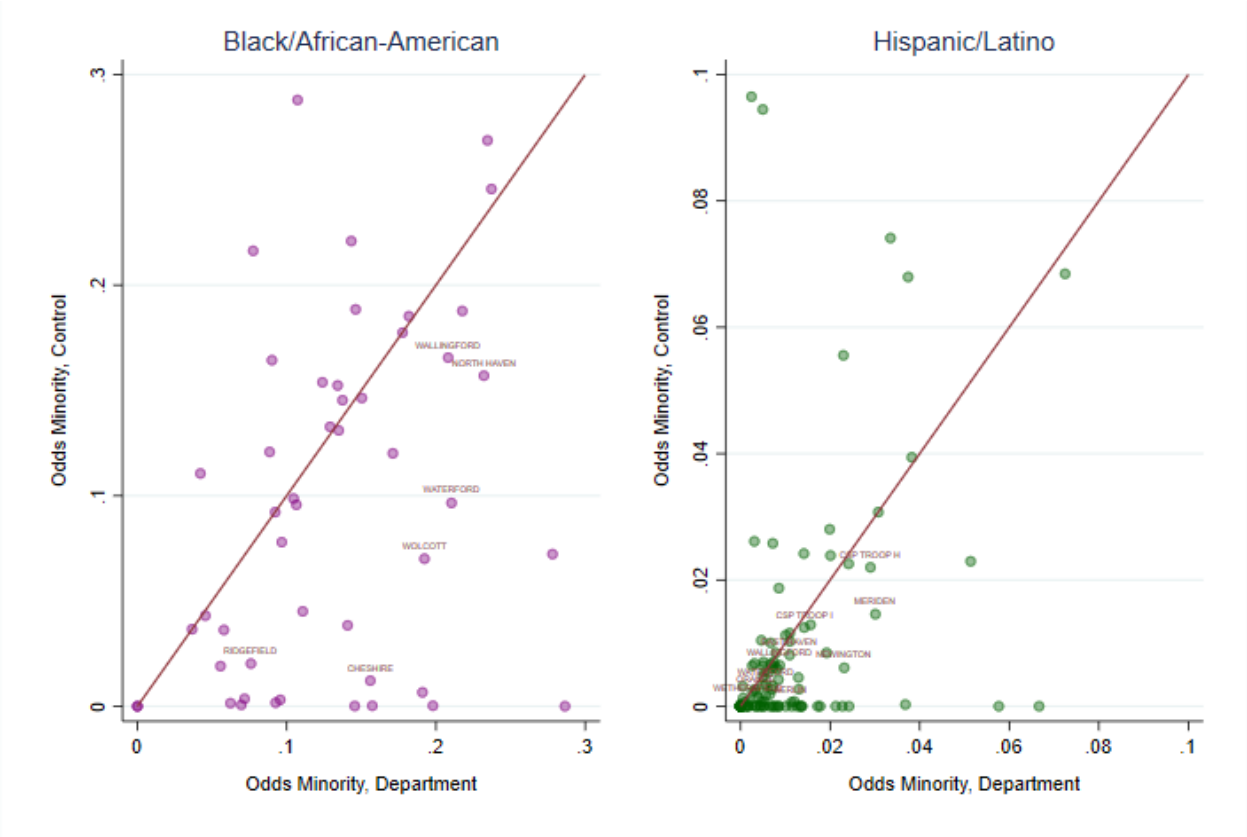
IV.A: AGGREGATE ANALYSIS WITH SYNTHETIC CONTROL, 2020 AND 2018-2020

Each municipal police department was examined independently by weighting observations with inverse propensity scores estimated using Equation 7 of Appendix A.3. The variables used to estimate the propensity scores are detailed in Table A.2 (1) of Appendix A.3. Treatment effects were estimated using Equation 8 of Appendix A.3 for individual departments and State Police troops across four demographic subgroups relative to non-Hispanic Caucasians. As before, we identify all departments found to have a disparity that is statistically significant at the 95% level in either the Hispanic or Black alone minority group. In this section, we graphically present the results from the synthetic control analysis and annotate towns with a statistically significant disparity in the rate of Black or Hispanic stops. We first provide results for the 2020 sample of the data as we have done in the prior three reports. However, we also leverage the full three-year sample from 2018-20 and graphically present estimates for smaller departments which previously had an insufficiently small sample to run the test on an annual basis. In the figures and discussion below, we highlight only the departments found to have a statistically significant disparity in the Black or Hispanic alone categories for either the 2020 or combined 2018-20 samples. Identification requires that departments and State Police troops have a disparity that is statistically significant at or above the 95% level in either of the Hispanic or Black alone minority groups. Further, we only highlight departments that withstand more rigorous doubly-robust estimation and that have a false discovery rate below 10% in both specifications. We provide the full set of results in Tables D.1 and D.3 and doubly-robust estimation in D.2 and D.4 of Appendix D.

Figure 4.1 plots the odds a Black (left panel) or Hispanic (right panel) motorist is stopped relative to a non-Hispanic Caucasian motorist in the focal town versus a synthetic control in 2020. Individual points on the figure represent specific municipal departments and State Police troops. The vertical axis plots the odds a stopped motorist is a minority in the synthetic control and the horizontal axis plots the same odds for the focal department. For ease of presentation in the figure, we approximate the regression results by imposing the estimated difference from Table D.1 of Appendix D on the unadjusted odds a minority motorist is stopped in focal department such that we obtain an estimate of the odds for the control. The red 45-degree line represents parity (equal treatment) between the focal department and control amongst minorities and non-Hispanic Caucasians. Thus, only departments falling below this line (bottom right quadrant) are more likely to stop minority motorists relative to their synthetic control. We annotate only those departments where the difference is statistically significant at or above the 95% confidence level in the main specification as well as with doubly-robust estimation.

Applying this test to the 2020 data, we identify the departments of Berlin (Hispanic), Bridgeport (Black), Cheshire (Black), State Police Troop G (Black), State Police Troop H (Hispanic), State Police Troop I (Black & Hispanic), East Haven (Hispanic), Hamden (Black), Meriden (Hispanic), New Britain (Black), New Haven (Black), Newington (Hispanic), North Haven (Black), Orange (Black & Hispanic), Ridgefield (Black), South Windsor (Black), Wallingford (Black & Hispanic), Waterford (Black & Hispanic), Wethersfield (Hispanic), and Wolcott (Black). All of these departments had a disparity in the Black or Hispanic alone category that was significant at a level exceeding 95% confidence, withstood doubly-robust estimation, and had a false discovery rate below 10%. For the full results, see Table D.1 for the baseline specification and Table D.2 of Appendix D for the double-robust estimates.

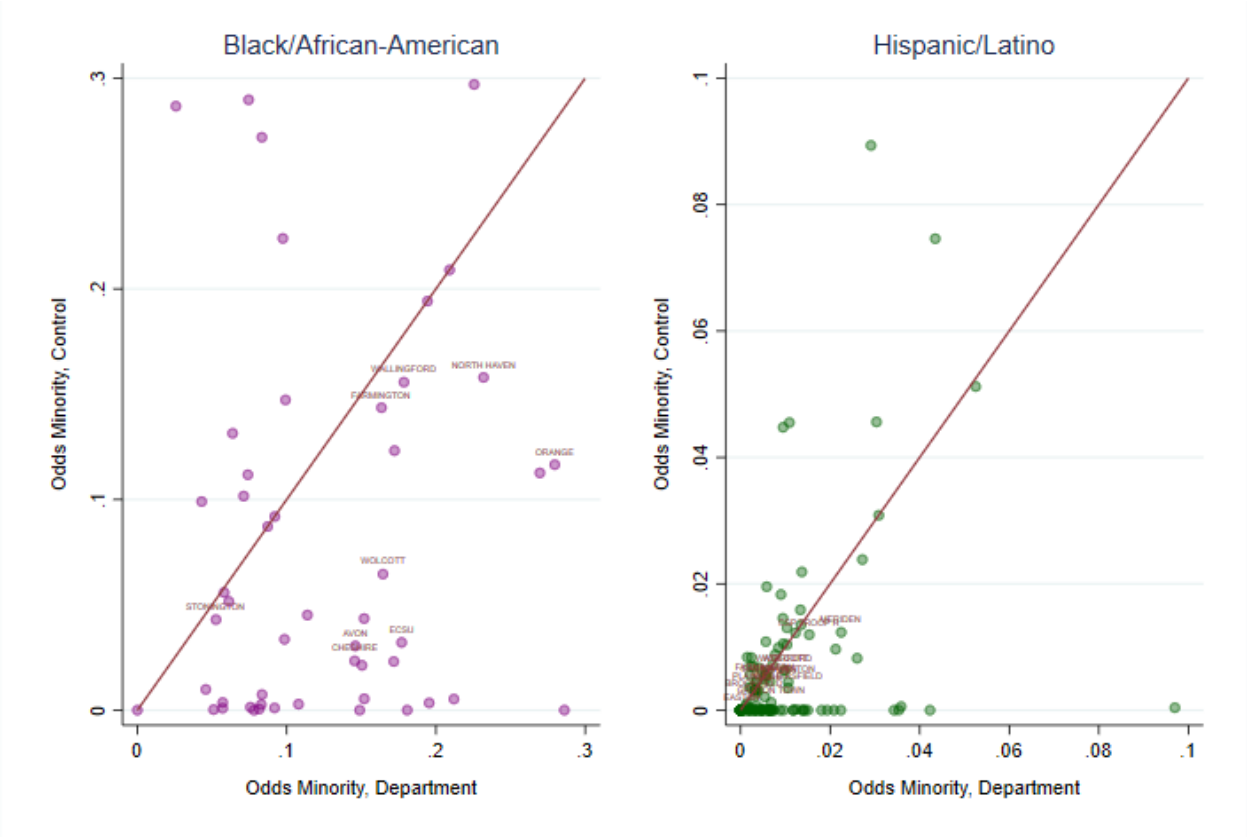
Figure 4.1: Synthetic Control Analysis, All Departments 2020



Notes: Coefficient estimates are obtained from Table D.1 of Appendix D and imposed on the raw odds that a minority is stopped in the focal department. The change in the odds a minority motorist was represented in the traffic stop data in the focal town is estimated using Equation 7 of Appendix A.3 where the variables used to estimate the propensity scores are detailed in Table A.2 (1) of Appendix A.3. Annotated departments include only those with a statistically significant disparity estimated with a confidence level at or exceeding the 95% in the combined sample of all traffic stops as well as in a robustness check with doubly-robust estimation (Table D.2 of Appendix D). Identified departments also had a false discovery rate below 10% estimated following Simes (1986), Benjamini and Hochberg (1995), and Benjamini and Yekutieli (2001).

Figure 4.2 contains estimates for the aggregate 2018-20 and follows the same format discussed above in reference to Figure 4.1. Applying this test to the 2018-20 data where we gain precision by utilizing a larger sample of traffic stops, we identify the departments of Avon (Black), Bridgeport (Black), Brookfield (Hispanic), Cheshire (Black), State Police Troop H (Hispanic), East Haven (Hispanic), Easton (Hispanic), ECSU (Black), Farmington (Black & Hispanic), Groton Town (Hispanic), Meriden (Hispanic), Newington (Hispanic), North Haven (Black), Orange (Black), Plainville (Hispanic), Stonington (Black), Wallingford (Black), Waterford (Hispanic), Wethersfield (Black & Hispanic), and Wolcott (Black & Hispanic). For the full results, see Table D.3 for the baseline specification and Table D.4 of Appendix D for the double-robust estimates.

Figure 4.2: Synthetic Control Analysis, All Departments 2018-20



Notes: Coefficient estimates are obtained from Table D.3 of Appendix D and imposed on the raw odds that a minority is stopped in the focal department. The change in the odds a minority motorist was represented in the traffic stop data in the focal town is estimated using Equation 7 of Appendix A.3 where the variables used to estimate the propensity scores are detailed in Table A.2 (1) of Appendix A.3. Annotated departments include only those with a statistically significant disparity estimated with a confidence level at or exceeding the 95% in the combined sample of all traffic stops as well as in a robustness check with doubly-robust estimation (Table D.4 of Appendix D). Identified departments also had a false discovery rate below 10% estimated following Simes (1986), Benjamini and Hochberg (1995), and Benjamini and Yekutieli (2001).

V: ANALYSIS OF TRAFFIC STOPS, DESCRIPTIVE STATISTICS AND INTUITIVE MEASURES

The descriptive statistics and benchmarks presented in this section help to understand patterns in Connecticut policing data. Although these simple statistics present an intriguing story, conclusions should not be drawn from any one measure alone. The two previously applied statistical tests of racial and ethnic disparities in the policing data are based solely on the policing data itself and rely on the construction of a theoretically derived identification strategy and a natural experiment. These results have been applied by academic and police researchers in numerous areas across the country and are generally considered to be the most current and relevant approaches to assessing policing data.

In all the benchmark analysis, the demography of motorists was grouped into three overlapping categories to ensure a large enough sample size for the analysis. Much of the analysis focuses on stops made of black (Hispanic or non-Hispanic) and Hispanic motorists (any race), the analysis also was conducted for aggregated groupings of all non-white motorists (Hispanic or non-Hispanic).

V.A: STATEWIDE AVERAGE COMPARISON

Comparing town data to statewide average data is frequently the first thing the public does when trying to understand and assess how a police department may be conducting traffic stops. In this section, a comparison to the statewide average is presented alongside the context necessary to understand the information. This benchmark does provide a simple and effective way to establish a baseline for all towns from which the relative differences between town stop numbers become more apparent. A detailed explanation of the methodology can be found in Appendix A.4. The analysis presented in this report only identified the departments for which the statewide average comparison indicated the largest distances between the net stop percentage and net resident population using 10 or more points as a threshold. Tables showing the calculations for all departments, rather than just those showing distance measures of more than 10 points, can be found in Appendix E of this report. Readers should note that this section focuses entirely on departments that exceeded the statewide average for stops in these racial groups.

Comparison of Racial/Ethnic Minority Drivers to the State Average

The racial/ethnic minority category includes all racial classifications except for white drivers. Specifically, it covers Blacks, Hispanics, Asian/Pacific Islander, American Indian/Alaskan Native, and Other Race classifications included in the census data.

For the study period from January 1, 2020 through December 31, 2020, the statewide percentage of drivers stopped by police who were identified as Minority was 38.7%. A total of 29 departments stopped a higher percentage of Minority drivers than the state average, 16 of which exceeded the statewide average by more than 10 percentage points. The statewide average for Minority residents (16+) is 25.2%. Of the 29 towns that exceeded the statewide average for Minority drivers stopped, 20 also have Minority resident populations (16+) that exceeded the statewide average.

After the stop and resident population percentages were adjusted using the method described in Appendix A.3 (2), a total of 14 departments were found to have a relative distance between their net Minority driver stop percentage and net Minority driving age population percentage of more than 10 points. Table 5.1 shows the data for these 14 departments. All department results are contained in the Table E.1 of Appendix E.

Table 5.1: Statewide Average Comparisons for Minority Drivers for Selected Towns

Municipal Department	Minority Stops	Difference Between Town and State Average	Minority Residents Age 16+	Difference Between Town and State Average	Distance Between Net Differences
Newington	53.9%	15.2%	14.5%	-10.7%	26.0%
Orange	46.8%	8.1%	10.7%	-14.5%	22.6%
Stratford	62.4%	23.7%	27.2%	2.0%	21.8%
Woodbridge	46.0%	7.3%	12.8%	-12.4%	19.7%
Wethersfield	43.4%	4.7%	12.5%	-12.8%	17.4%
West Hartford	50.8%	12.1%	21.8%	-3.4%	15.5%
Windsor Locks	40.0%	1.3%	12.7%	-12.5%	13.8%
South Windsor	41.4%	2.7%	14.6%	-10.6%	13.4%
Wilton	34.2%	-4.5%	8.1%	-17.1%	12.7%
Vernon	39.1%	0.4%	14.1%	-11.2%	11.6%
Berlin	30.5%	-8.2%	5.8%	-19.5%	11.3%
New Britain	69.7%	31.0%	45.0%	19.8%	11.2%
Wolcott	30.1%	-8.6%	5.4%	-19.8%	11.2%
Meriden	59.3%	20.6%	34.9%	9.6%	10.9%
Connecticut	38.7%	0.0%	25.2%	0.0%	NA

Comparison of Black Drivers to the State Average

For the study period, the statewide percentage of motorists stopped by police who were identified as Black was 18.8%. A total of 27 departments stopped a higher percentage of Black motorists than the state average, 9 of which exceeded the statewide average by more than 10 percentage points. The statewide average for Black residents (16+) is 9.1%. Of the 27 towns that exceeded the statewide average for Black drivers stopped, 16 also have Black resident populations (16+) that exceeded the statewide average.

After the stop and resident population percentages were adjusted using the method described in Appendix A.3 (2), a total of 4 departments were found to have a relative distance between their net Black driver stop percentage and net Black driving age population percentage of more than 10 points. Table 5.2 shows the data for these 4 towns. All department results are contained in the Table E.2 of Appendix E.

Table 5.2: Statewide Average Comparisons for Black Drivers for Selected Towns

Municipal Department	Black Stops	Difference Between Town and State Average	Black Residents Age 16+	Difference Between Town and State Average	Distance Between Net Differences
Orange	28.0%	9.2%	1.3%	-7.8%	17.0%
Stratford	37.7%	18.9%	12.8%	3.6%	15.3%
Woodbridge	26.6%	7.8%	1.9%	-7.2%	15.0%

Municipal Department	Black Stops	Difference Between Town and State Average	Black Residents Age 16+	Difference Between Town and State Average	Distance Between Net Differences
Windsor Locks	25.2%	6.4%	4.3%	-4.8%	11.3%
Connecticut	18.8%	0.0%	9.1%	0.0%	NA

Comparison of Hispanic Drivers to the Statewide Average

For the study period, the statewide percentage of drivers stopped by police who were identified as Hispanic was 17%. A total of 25 towns stopped a higher percentage of Hispanic drivers than the state average, 9 of which exceeded the statewide average by more than 10 percentage points. The statewide Hispanic resident population (16+) is 11.9%. Of the 25 towns that exceeded the statewide average for Hispanic drivers stopped, 14 also have Hispanic resident populations (16+) that exceeded the statewide average.

After the stop and resident population percentages were adjusted using the method described in Appendix A.3 (2), a total of 3 towns were found to have a relative distance between their net Hispanic driver stop percentage and net Hispanic population percentage of more than 10 points. Table 5.3 shows the data for the towns named above. All department results are contained in the Table E.3 of Appendix E.

Table 5.3: Statewide Average Comparisons for Hispanic Drivers for Selected Towns

Municipal Department	Hispanic Stops	Difference Between Town and State Average	Hispanic Residents Age 16+	Difference Between Town and State Average	Distance Between Net Differences
Newington	29.2%	12.2%	6.4%	-5.5%	17.7%
New Britain	48.9%	31.9%	31.8%	19.8%	12.0%
Wethersfield	24.2%	7.2%	7.1%	-4.8%	12.0%
Connecticut	17.0%	0.0%	11.9%	0.0%	NA

V.B: ESTIMATED DRIVING POPULATION COMPARISON

The EDP analysis was confined to the 94 municipal police departments in Connecticut. There are 80 municipalities in Connecticut that either (1) do not have their own departments and rely upon the state police for their law and traffic enforcement services or (2) have one or more resident state troopers who either provide their police services or supervise local constables or law enforcement officers. Most of these communities are smaller and located in Connecticut's more rural areas. Once the state police stops made on limited access highways were removed from the data, we found that these towns generally had too few stops during the 6am to 10am and 3pm to 7pm periods to yield meaningful comparisons. Consequently, these towns were not considered appropriate candidates for the EDP analysis.

The only traffic stops included in this analysis were stops conducted Monday through Friday from 6:00am to 10:00am and 3:00pm to 7:00pm (peak commuting hours). Overall, when compared to their respective EDP, 89 departments had a disparity between the racial and ethnic Minority motorists stopped and the proportion of non-whites estimated to be in the EDP. For many of these

departments (20) the disparity was very small (less than five percentage points). In the remaining 5 communities, the disparity was negative, meaning that more white drivers were stopped than expected in the EDP numbers. However, the negative disparities were also very small in most communities. There were 91 departments with a disparity for Black drivers stopped and 84 departments with a disparity for Hispanic drivers stopped when compared to the respective EDPs.

Due to the margins of error inherent in the EDP estimates, we established a reasonable set of thresholds for determining if a department shows a disparity in its stops when compared to its EDP percentages. Departments that exceed their EDP percentages by greater than 10 percentage points in any of the three categories: (1) Minority (all race/ethnicity), (2) Black non-Hispanic, and (3) Hispanic, were identified in our tier one group. Table 5.4 shows the data for the departments meeting the tier one criteria. In addition, departments that exceeded their EDP percentage by more than five but less than 10 percentage points were identified in our tier two group for this benchmark if the ratio of the percentage of stops for the target group compared to the baseline measure for that group also was 1.75 or above (percentage of stops divided by benchmark percentage equals 1.75 or more) in any of the three categories: (1) Minority (all race/ethnicity), (2) Black non-Hispanic, or (3) Hispanic. Table 5.5 shows the data for the departments meeting the tier two criteria. Results for all departments are available in Tables E.4, E.5, and E.6 of Appendix E.

Table 5.4: Highest Ratio of Stops to EDP (Tier I)

Department Name	Number of Stops	Stops	EDP	Absolute Difference	Ratio
Minority (All Non-White)					
Hartford	3,036	88.3%	50.1%	38.2%	1.76
New Britain	685	69.1%	38.9%	30.2%	1.78
Stratford	192	57.8%	27.9%	29.9%	2.07
East Hartford	1,766	68.1%	40.0%	28.1%	1.70
Woodbridge	50	44.0%	17.3%	26.7%	2.54
Newington	619	43.9%	19.0%	25.0%	2.31
Orange	663	44.0%	19.5%	24.5%	2.26
West Hartford	984	47.5%	24.1%	23.3%	1.97
Meriden	774	54.1%	31.4%	22.7%	1.72
Wolcott	83	30.1%	8.2%	21.9%	3.68
Windsor	2,300	54.8%	33.2%	21.7%	1.65
Waterbury	551	61.7%	40.1%	21.6%	1.54
New Haven	2,490	67.5%	46.3%	21.1%	1.46
Windsor Locks	347	39.5%	18.8%	20.7%	2.10
Wethersfield	255	36.1%	16.6%	19.5%	2.17
Bloomfield	791	61.9%	42.7%	19.3%	1.45
West Haven	615	53.8%	35.6%	18.2%	1.51
Clinton	260	26.5%	8.4%	18.1%	3.16
Norwich	431	42.5%	24.7%	17.8%	1.72
Willimantic	329	46.8%	29.3%	17.5%	1.60
South Windsor	754	34.9%	17.9%	16.9%	1.94
Naugatuck	1,309	33.6%	16.9%	16.7%	1.99
Wallingford	1,381	31.3%	15.6%	15.6%	2.00
Manchester	1,025	41.7%	26.7%	15.0%	1.56
Plymouth	158	19.0%	4.6%	14.4%	4.13
East Haven	252	30.6%	16.6%	14.0%	1.85
Darien	478	29.9%	15.9%	14.0%	1.88

Department Name	Number of Stops	Stops	EDP	Absolute Difference	Ratio
Vernon	206	29.1%	15.4%	13.7%	1.89
Easton	137	21.2%	7.5%	13.7%	2.82
Wilton	772	31.0%	17.4%	13.6%	1.78
Trumbull	327	31.2%	18.2%	13.0%	1.71
Groton City	160	31.3%	18.4%	12.9%	1.70
Waterford	736	26.0%	13.9%	12.1%	1.87
Ledyard	496	27.4%	15.8%	11.6%	1.73
Derby	132	32.6%	21.1%	11.4%	1.54
New Milford	430	22.1%	11.3%	10.8%	1.96
Portland	34	17.6%	7.0%	10.7%	2.53
Fairfield	2,600	28.2%	17.5%	10.6%	1.61
East Windsor	218	29.4%	19.2%	10.2%	1.53
Weston	56	19.6%	9.5%	10.2%	2.08
New Canaan	1,073	23.9%	13.8%	10.1%	1.73
Black					
Hartford	3,036	48.2%	21.6%	26.6%	2.23
Bloomfield	791	53.0%	31.1%	21.8%	1.70
Stratford	192	33.9%	12.1%	21.7%	2.80
Woodbridge	50	26.0%	4.8%	21.2%	5.45
East Hartford	1,766	38.1%	17.0%	21.1%	2.24
Orange	663	26.4%	6.3%	20.1%	4.22
New Haven	2,490	41.8%	22.6%	19.2%	1.85
Windsor	2,300	39.2%	20.1%	19.2%	1.96
Windsor Locks	347	24.5%	7.1%	17.3%	3.43
Norwich	431	23.7%	7.5%	16.1%	3.15
West Haven	615	31.7%	16.4%	15.3%	1.93
Bridgeport	1,362	41.0%	26.5%	14.6%	1.55
Manchester	1,025	23.5%	9.9%	13.6%	2.37
West Hartford	984	21.1%	7.6%	13.5%	2.77
Meriden	774	20.3%	7.7%	12.5%	2.62
Trumbull	327	18.3%	5.9%	12.5%	3.13
Portland	34	14.7%	2.7%	12.0%	5.51
Waterbury	551	26.1%	14.3%	11.8%	1.82
Hamden	688	27.6%	16.1%	11.5%	1.72
Newington	619	17.0%	5.5%	11.4%	3.07
South Windsor	754	17.0%	5.8%	11.2%	2.95
Ledyard	496	15.3%	4.3%	11.1%	3.60
Groton City	160	16.3%	5.5%	10.8%	2.97
Wolcott	83	13.3%	2.5%	10.7%	5.23
Hispanic					
New Britain	685	52.1%	26.0%	26.1%	2.00
Willimantic	329	39.2%	23.1%	16.1%	1.70
Hartford	3,036	38.8%	24.4%	14.4%	1.59
Newington	619	22.1%	8.9%	13.2%	2.49
Danbury	1,503	30.9%	18.6%	12.4%	1.66
Waterbury	551	34.8%	22.7%	12.2%	1.54
Meriden	774	33.2%	21.1%	12.1%	1.57
Easton	137	15.3%	3.5%	11.8%	4.39
Wethersfield	255	20.4%	8.7%	11.7%	2.35
Wilton	772	19.3%	8.1%	11.2%	2.38
East Hartford	1,766	28.1%	17.8%	10.4%	1.58

Department Name	Number of Stops	Stops	EDP	Absolute Difference	Ratio
Stratford	192	22.9%	12.7%	10.3%	1.81
Wolcott	83	14.5%	4.3%	10.1%	3.33
New Milford	430	16.3%	6.2%	10.0%	2.61

Table 5.5: High Ratio of Stops to EDP (Tier II)

Department Name	Number of Stops	Stops	EDP	Absolute Difference	Ratio
Minority (All Non-White)					
Berlin	714	22.7%	12.9%	9.8%	1.76
Newtown	321	19.0%	9.5%	9.5%	2.01
Middlebury	203	20.7%	11.4%	9.3%	1.82
Redding	196	15.8%	7.6%	8.3%	2.09
Old Saybrook	245	16.7%	8.5%	8.2%	1.97
Granby	43	14.0%	6.3%	7.6%	2.21
Coventry	113	10.6%	5.0%	5.6%	2.11
Black					
Granby	43	11.6%	2.2%	9.4%	5.21
Naugatuck	1,309	14.1%	4.9%	9.1%	2.86
Wethersfield	255	13.7%	4.9%	8.8%	2.80
Clinton	260	10.0%	1.2%	8.8%	8.41
Vernon	206	14.1%	5.3%	8.8%	2.65
Darien	478	12.1%	3.6%	8.6%	3.40
North Haven	703	14.8%	6.3%	8.5%	2.35
Ansonia	449	17.8%	9.5%	8.3%	1.88
Waterford	736	12.1%	3.9%	8.2%	3.10
East Windsor	218	16.1%	7.9%	8.1%	2.03
Middletown	244	17.6%	9.7%	7.9%	1.81
Wallingford	1,381	11.5%	3.8%	7.7%	3.05
Plymouth	158	8.2%	0.8%	7.4%	10.41
East Haven	252	11.5%	4.2%	7.3%	2.74
Middlebury	203	9.9%	2.6%	7.2%	3.75
Newtown	321	9.0%	2.0%	7.1%	4.56
Cromwell	270	12.2%	5.6%	6.6%	2.17
Avon	224	9.8%	3.5%	6.3%	2.83
Berlin	714	9.2%	3.5%	5.8%	2.66
Rocky Hill	239	11.3%	5.8%	5.5%	1.95
Enfield	797	9.5%	4.1%	5.4%	2.30
Fairfield	2,600	10.7%	5.3%	5.4%	2.02
Seymour	582	8.6%	3.4%	5.1%	2.49
Hispanic					
Clinton	260	14.6%	5.2%	9.4%	2.83
Naugatuck	1,309	18.0%	8.8%	9.2%	2.05
Bethel	707	17.5%	8.5%	9.0%	2.06
East Haven	252	17.9%	9.1%	8.7%	1.96
Wallingford	1,381	17.3%	8.6%	8.7%	2.00
New Canaan	1,073	14.9%	6.4%	8.5%	2.34
West Hartford	984	18.7%	10.3%	8.4%	1.82
Weston	56	12.5%	4.2%	8.3%	2.95
Vernon	206	14.1%	6.0%	8.1%	2.34
Plymouth	158	10.8%	3.4%	7.3%	3.12

Department Name	Number of Stops	Stops	EDP	Absolute Difference	Ratio
Darien	478	14.9%	8.0%	6.9%	1.86
Fairfield	2,600	15.0%	8.2%	6.8%	1.82
Orange	663	14.2%	7.7%	6.5%	1.85
Woodbridge	50	12.0%	5.5%	6.5%	2.17
East Lyme	175	10.3%	3.9%	6.4%	2.64
Ridgefield	788	12.8%	6.7%	6.1%	1.92
Waterford	736	12.2%	6.2%	6.0%	1.97
Redding	196	9.7%	4.0%	5.7%	2.43
Windsor Locks	347	13.0%	7.3%	5.7%	1.78
Old Saybrook	245	9.8%	4.4%	5.4%	2.22
Middlebury	203	10.8%	5.6%	5.3%	1.95
Southington	885	10.3%	5.1%	5.2%	2.02

V.C: RESIDENT ONLY STOP COMPARISON

Overall, when compared to the census, 83 departments stopped more non-white resident drivers than their non-white resident population. Again, the disparity for many of these departments was very small. In 9 communities, the disparity was negative, meaning that fewer non-white drivers were stopped than expected based on the population numbers. However, the negative disparities were also very small in most communities. Almost all departments (89 of 94) had a disparity for Black drivers stopped and 69 departments had a disparity for Hispanic drivers stopped when compared to the resident driving age population.

Departments with a difference of 10 percentage points or more between the resident stops and the 16+ resident population in any of the three categories: (1) Minority (all race/ethnicity), (2) Black non-Hispanic, and (3) Hispanic, were identified in our tier one group. Table 5.6 shows the data for the departments meeting the tier one criteria. In addition, departments that exceeded their resident population percentage by more than five but less than 10 percentage points were identified in our tier two group for this benchmark if the ratio of the percentage of resident stops for the target group compared to the baseline measure for that group also was 1.75 or above (percentage of stopped residents divided by resident benchmark percentage equals 1.75 or more) in any of three categories: (1) Minority (all race/ethnicity), (2) Black non-Hispanic, and (3) Hispanic. Table 5.7 shows the data for the departments meeting the tier two criteria. Results for all departments are available in Tables E.7, E.8, and E.9 of Appendix E.

Table 5.6: Highest Ratio of Resident Population to Resident Stops (Tier I)

Department Name	Number of Residents	Residents	Resident Stops	Minority Resident Stops	Difference	Ratio
Minority (All Non-White)						
Stratford	40,980	27.2%	303	60.4%	33.2%	2.22
Willimantic	20,176	34.6%	647	67.2%	32.7%	1.95
Waterbury	83,964	48.1%	876	79.0%	30.9%	1.64
New Britain	57,164	45.0%	1,561	75.7%	30.7%	1.68
Meriden	47,445	34.9%	1,296	63.4%	28.6%	1.82
Norwich	31,638	29.1%	1,003	52.2%	23.2%	1.80
Manchester	46,667	27.9%	1,877	50.5%	22.5%	1.81
East Hartford	40,229	51.6%	1,636	73.6%	22.0%	1.43
Derby	10,391	20.6%	92	42.4%	21.8%	2.06

Department Name	Number of Residents	Residents	Resident Stops	Minority Resident Stops	Difference	Ratio
Windsor	23,222	43.9%	2,278	65.2%	21.3%	1.48
Vernon	23,800	14.1%	499	34.9%	20.8%	2.48
New Haven	100,702	62.8%	3,277	83.2%	20.3%	1.32
Danbury	64,361	38.6%	1,183	58.4%	19.8%	1.51
New London	21,835	43.6%	667	61.9%	18.4%	1.42
Bloomfield	16,982	61.5%	585	79.3%	17.8%	1.29
Hamden	50,012	30.9%	596	48.2%	17.2%	1.56
Newington	24,978	14.5%	439	31.7%	17.2%	2.18
West Hartford	49,650	21.8%	569	38.5%	16.7%	1.77
Naugatuck	25,099	15.2%	2,062	31.3%	16.2%	2.06
New Milford	21,891	9.7%	778	24.8%	15.1%	2.56
Groton City*	7,960	26.9%	169	42.0%	15.1%	1.56
Windsor Locks	10,117	12.7%	260	26.9%	14.2%	2.11
Wolcott	13,175	5.4%	87	19.5%	14.1%	3.60
West Haven	44,518	37.6%	1,345	51.4%	13.9%	1.37
Enfield	33,218	8.7%	1,890	22.3%	13.7%	2.58
South Windsor	20,162	14.6%	704	27.3%	12.7%	1.87
Middletown	38,747	23.5%	878	36.0%	12.5%	1.53
Bridgeport	109,401	73.3%	1,860	85.6%	12.3%	1.17
Bristol	48,439	12.7%	752	24.7%	12.0%	1.95
Ansonia	14,979	25.6%	651	37.5%	11.9%	1.46
Clinton	10,540	6.1%	320	16.9%	10.8%	2.76
Torrington	29,251	11.0%	1,175	21.4%	10.4%	1.95
Seymour	13,260	9.8%	935	20.1%	10.3%	2.06
Wallingford	36,530	11.1%	848	21.2%	10.1%	1.91
Black						
Stratford	40,980	12.76%	303	36.3%	23.5%	2.85
New Haven	100,702	32.16%	3,277	54.5%	22.4%	1.70
Windsor	23,222	32.20%	2,278	53.9%	21.7%	1.67
Norwich	31,638	8.96%	1,003	30.0%	21.0%	3.35
Bridgeport	109,401	31.82%	1,860	52.1%	20.3%	1.64
Bloomfield	16,982	54.76%	585	74.9%	20.1%	1.37
Hamden	50,012	18.28%	596	37.2%	19.0%	2.04
East Hartford	40,229	22.52%	1,636	41.4%	18.9%	1.84
Manchester	46,667	10.15%	1,877	28.8%	18.7%	2.84
Groton City*	7,960	7.70%	169	25.4%	17.7%	3.30
Waterbury	83,964	17.37%	876	33.9%	16.5%	1.95
Meriden	47,445	7.80%	1,296	21.5%	13.7%	2.75
Middletown	38,747	11.68%	878	24.8%	13.2%	2.13
Vernon	23,800	4.70%	499	17.4%	12.7%	3.71
Ansonia	14,979	9.74%	651	21.4%	11.6%	2.19
New London	21,835	15.18%	667	26.5%	11.4%	1.75
Windsor Locks	10,117	4.27%	260	15.4%	11.1%	3.60
West Haven	44,518	17.70%	1,345	28.4%	10.7%	1.60
Derby	10,391	6.03%	92	16.3%	10.3%	2.70
Hispanic						
Willimantic	20,176	28.88%	647	58.6%	29.7%	2.03
New Britain	57,164	31.75%	1,561	57.3%	25.5%	1.80
Danbury	64,361	23.25%	1,183	46.3%	23.1%	1.99

Department Name	Number of Residents	Residents	Resident Stops	Minority Resident Stops	Difference	Ratio
Waterbury	83,964	27.54%	876	44.3%	16.8%	1.61
Meriden	47,445	24.86%	1,296	41.3%	16.4%	1.66
Derby	10,391	12.37%	92	26.1%	13.7%	2.11
New Milford	21,891	5.46%	778	17.0%	11.5%	3.11
Newington	24,978	6.39%	439	17.1%	10.7%	2.68
Stratford	40,980	11.92%	303	22.1%	10.2%	1.85

Table 5.7: High Ratio of Resident Population to Resident Stops (Tier II)

Department Name	Number of Residents	Residents	Resident Stops	Minority Resident Stops	Difference	Ratio
Minority (All Non-White)						
Woodbridge	7,119	12.8%	22	22.7%	9.9%	1.77
Plymouth	9,660	2.5%	275	11.6%	9.2%	4.70
Brookfield	12,847	8.1%	219	16.4%	8.3%	2.03
Portland	7,480	4.6%	83	12.0%	7.4%	2.60
Suffield	10,782	4.9%	125	10.4%	5.5%	2.12
Black						
Ledyard	11,527	3.10%	453	12.6%	9.5%	4.06
Naugatuck	25,099	4.11%	2,062	12.0%	7.9%	2.93
Enfield	33,218	2.63%	1,890	10.1%	7.4%	3.82
Groton Town	31,520	6.07%	959	13.2%	7.2%	2.18
Woodbridge	7,119	1.94%	22	9.1%	7.2%	4.69
West Hartford	49,650	5.65%	569	12.5%	6.8%	2.21
Seymour	13,260	2.25%	935	8.9%	6.6%	3.95
Shelton	32,010	2.07%	95	8.4%	6.4%	4.07
Bristol	48,439	3.24%	752	9.6%	6.3%	2.96
Rocky Hill	16,224	3.77%	298	10.1%	6.3%	2.67
East Windsor	9,164	5.96%	211	11.8%	5.9%	1.99
North Haven	19,608	2.91%	425	8.5%	5.6%	2.91
South Windsor	20,162	3.68%	704	9.2%	5.6%	2.51
Wolcott	13,175	1.53%	87	6.9%	5.4%	4.50
Portland	7,480	1.87%	83	7.2%	5.4%	3.86
Waterford	15,760	2.29%	458	7.4%	5.1%	3.24
North Branford	11,549	1.33%	79	6.3%	5.0%	4.75
Hispanic						
Naugatuck	25,099	7.77%	2,062	16.9%	9.1%	2.17
Norwich	31,638	10.59%	1,003	19.0%	8.5%	1.80
Vernon	23,800	5.21%	499	13.4%	8.2%	2.58
Clinton	10,540	4.41%	320	11.6%	7.2%	2.62
Wallingford	36,530	6.71%	848	13.8%	7.1%	2.06
Bristol	48,439	7.65%	752	14.6%	7.0%	1.91
Torrington	29,251	6.92%	1,175	13.6%	6.7%	1.97
West Hartford	49,650	8.78%	569	15.5%	6.7%	1.76
East Windsor	9,164	4.34%	211	10.9%	6.6%	2.51
Enfield	33,218	4.00%	1,890	10.5%	6.5%	2.62
Wethersfield	21,607	7.10%	221	13.6%	6.5%	1.91
Bethel	14,675	6.65%	767	13.0%	6.4%	1.96
Windsor Locks	10,117	3.46%	260	8.8%	5.4%	2.56

Department Name	Number of Residents	Residents	Resident Stops	Minority Resident Stops	Difference	Ratio
Seymour	13,260	5.53%	935	10.5%	5.0%	1.90

V.D: CONCLUSIONS FROM THE DESCRIPTIVE COMPARISONS

The descriptive tests outlined in the above sections are designed to be used as a screening tool to identify those jurisdictions with consistent data disparities that exceed certain thresholds. The tests compare stop data to three different benchmarks: (1) statewide average, (2) the estimated driving population, and (3) resident-only stops that each cover three driver categories: Black, Hispanic, and Minority. Department data is then measured against the resulting total of nine descriptive measures for evaluation purposes.

In order to classify the disparities within the descriptive benchmarks, any disparity greater than 10 percentage points for a measure was given a weight of one (1) point. Any disparity of more than five, but less than 10 percentage points accompanied by a disparity ratio of 1.75 or above was given a weight of 0.5 points. Therefore, a department could score no more than nine (9) total points.

Table 5.8 identifies the 15 departments with significant disparities. A department was identified if the stop data was found to exceed the disparity threshold level in at least two of the three benchmark areas and a weighted total score of 4.5 or more. All department results are contained in Table E.10 of Appendix E.

Table 5.8: Departments with the Greatest Number of Disparities Relative to Descriptive Benchmarks

Department Name	Statewide Average			Estimated Driving Population			Resident Population			Point Total
	M	B	H	M	B	H	M	B	H	
Stratford	21.8%	15.3%		29.9%	21.7%	10.3%	33.2%	23.5%	10.2%	8.0
Meriden	10.9%			22.7%	12.5%	12.1%	28.6%	13.7%	16.4%	7.0
Newington	26.0%		17.7%	25.0%	11.4%	13.2%	17.2%		10.7%	7.0
Windsor Locks	13.8%	11.3%		20.7%	17.3%	5.7%	14.2%	11.1%	5.4%	7.0
New Britain	11.2%		12.0%	30.2%		26.1%	30.7%		25.5%	6.0
Waterbury				21.6%	11.8%	12.2%	30.9%	16.5%	16.8%	6.0
Vernon	11.6%			13.7%	8.8%	8.1%	20.8%	12.7%	8.2%	5.5
West Hartford	15.5%			23.3%	13.5%	8.4%	16.7%	6.8%	6.7%	5.5
Wolcott	11.2%			21.9%	10.7%	10.1%	14.1%	5.4%		5.5
Woodbridge	19.7%	15.0%		26.7%	21.2%	6.5%	9.9%	7.2%		5.5
East Hartford				28.1%	21.1%	10.4%	22.0%	18.9%		5.0

Wethersfield	17.4%		12.0%	19.5%	8.8%	11.7%			6.5%	5.0
Norwich				17.8%	16.1%		23.2%	21.0%	8.5%	4.5
Orange	22.6%	17.0%		24.5%	20.1%	6.5%				4.5
South Windsor	13.4%			16.9%	11.2%		12.7%	5.6%		4.5

VI. ANALYSIS OF STOP DISPOSITIONS

In this section, we test for disparities in the outcomes of traffic stops using a model that examines the distribution of dispositions conditional on race and the reason for the stop. Specifically, we test whether traffic stops made of minority motorists result in different outcomes relative to their non-Hispanic Caucasians peers following the model outlined in Equation 10 of Appendix A.6. Since ex-ante it is unclear whether discrimination would create more or less severe traffic stop outcomes in the data, we simply test for equality in the distribution of outcomes across demography conditional on the motivating reason for the stop. Rather than making unreasonable assumptions about how discrimination should affect outcomes, we simply assume that the overall distribution will not be equal across race. The intuition is similar to hit-rate style tests but where we are unable to ex-ante sign the direction that we expect the bias to take. We implement the test by applying a multinomial logistic regression on the four possible stop outcomes and conditions on race and the reason for the stop. We then conduct a joint hypothesis test on the interaction between an indicator of race and the reason for the stop.

We account for differences in outcomes not related to this interaction term by including additional controls for age, gender, hour, day of the week, week of year, and officer fixed effects. In terms of possible outcomes, we regress indicators for warning (no search), arrest (no search), ticket/misdemeanor (search), warning (search), arrest (search), and where ticket/misdemeanor (no search) is the omitted category. We condition on the basis of the stop using five indicators for stops made on the basis of equipment violation, seatbelt/cellphone, registration/license, all other violations, and where speeding violations are the omitted category. We provide one important cautionary note about interpreting our test as causal evidence of discrimination. Ideally, this test would be performed on data containing *all* violations observed by the police officer prior to making a traffic stop and where we would include a control for the number of total violations. In practice, data on traffic stops typically only contain the most severe reason that motivated the stop. In the absence of data on the full set of violations observed by police officers, we suggest that the reader interpret results from this test as providing descriptive evidence to be viewed in concert with other such empirical measures.

VI.A: AGGREGATE ANALYSIS OF STOP DISPOSITION, 2020

Table 6.1 presents the results of applying a multinomial logit to a sample of all traffic stops with six distinct stop outcomes regressed on race, stop basis, and their interaction. Unlike prior sections where we utilized the historical timeseries data in the aggregate analysis and a three-year combined sample for the department analysis, we focus on only the 2020 data in this section. Our focus on the 2020 data is due to the fact that this test relies on the full sample of traffic stops, rather than a smaller and more restrictive subsample. Below, we present the coefficient estimates on the interaction between race and the stop basis for each outcome relative to the omitted category, i.e. no search-ticket/misdemeanor issued. As in prior years, we find strong evidence suggesting that minority motorists are treated differently than their non-Hispanic Caucasians counterparts even when they are stopped for the same reason. In particular, we find that minority drivers are more frequently given a warning but less likely to be searched. For warnings, the disparity is largest in magnitude for stops made based on a license or registration as well as moving and signal or stop violations. For

searches, the disparity is largest in magnitude for moving and all other violations. A joint hypothesis test across all the interaction terms and all outcomes indicate that the difference in outcomes are statistically is significant at the 99% level for each demographic group relative to non-Hispanic Caucasians motorists.

Table 6.1: Multinomial Logistic Regression of Outcome on Race/Ethnicity and Reason for Stop, All Traffic Stops 2020

	Non-White		Black		Hispanic		Black or Hispanic	
	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE
No Search, Warning or No Action								
All Other	0.073	(0.178)	0.063	(0.197)	-0.063	(0.14)	-0.06	(0.159)
Equip.	-0.062	(0.115)	-0.039	(0.124)	-0.124	(0.09)	-0.194*	(0.098)
Reg. or Lic.	0.363*	(0.129)	0.349*	(0.142)	0.211*	(0.101)	0.242*	(0.109)
Signal or Stop	0.25*	(0.112)	0.235*	(0.121)	0.127	(0.078)	0.15*	(0.085)
Moving	0.418*	(0.084)	0.384*	(0.091)	0.323*	(0.083)	0.333*	(0.074)
No Search, Arrest								
All Other	-0.417*	(0.18)	-0.685*	(0.183)	-0.859*	(0.277)	-0.655*	(0.202)
Equip.	-0.01	(0.224)	-0.062	(0.226)	-0.304	(0.27)	-0.175	(0.215)
Reg. or Lic.	0.873*	(0.245)	0.807*	(0.245)	0.12	(0.301)	0.561*	(0.244)
Signal or Stop	0.34	(0.228)	0.266	(0.236)	-0.433*	(0.247)	0.047	(0.213)
Moving	-0.299*	(0.171)	-0.45*	(0.2)	-0.41*	(0.239)	-0.31	(0.192)
Search, Ticket or Misdemeanor								
All Other	-0.499*	(0.155)	0.317	(0.204)	-0.032	(0.16)	-0.571*	(0.142)
Equip.	-0.363*	(0.157)	0.051	(0.161)	-0.122	(0.171)	-0.529*	(0.144)
Reg. or Lic.	-0.144	(0.207)	0.342	(0.211)	0.294	(0.189)	-0.179	(0.174)
Signal or Stop	-0.269	(0.263)	-0.058	(0.259)	0.052	(0.23)	-0.28	(0.212)
Moving	-0.13	(0.206)	0.334	(0.207)	0.091	(0.158)	-0.202	(0.152)
Search, Warning								
All Other	-0.27	(0.289)	-0.151	(0.281)	-0.274	(0.335)	-0.387	(0.285)
Equip.	-0.203	(0.214)	-0.27	(0.193)	-0.326	(0.228)	-0.449*	(0.182)
Reg. or Lic.	0.165	(0.327)	0.097	(0.325)	-0.312	(0.283)	-0.182	(0.288)
Signal or Stop	0.016	(0.221)	-0.121	(0.194)	-0.392	(0.276)	-0.233	(0.218)
Moving	0.23	(0.249)	0.21	(0.222)	0.058	(0.235)	0.082	(0.208)
Search, Arrest								
All Other	-0.669*	(0.23)	-0.445*	(0.234)	-0.474*	(0.185)	-0.787*	(0.192)
Equip.	-0.301	(0.248)	-0.217	(0.217)	-0.159	(0.239)	-0.482*	(0.211)
Reg. or Lic.	0.312	(0.284)	0.324	(0.265)	0.577*	(0.26)	0.294	(0.239)
Signal or Stop	-0.288	(0.297)	-0.304	(0.291)	-0.182	(0.22)	-0.418*	(0.219)
Moving	-0.674*	(0.254)	-0.617*	(0.23)	-0.376*	(0.174)	-0.701*	(0.184)
Chi^2	1.91E+02		1.82E+02		88.63		1.83E+02	
P-Value	0		0		0		0	
Sample Size	185,083		178,418		171,335		214,153	

Note 1: The coefficients are presented as log odds-ratios along with standard errors clustered at the department level. A coefficient concatenated with * represents a p-value of .1, ** represents a p-value of .05, and *** represents a p-value of .01 significance.

Note 2: All specifications include controls for gender, age, hour, day of the week, and week of year fixed effects.

Note 3: Q-Values were estimated using a false discovery rate procedure following Simes (1986) and later refined by Benjamini and Hochberg (1995) and Benjamini and Yekutieli (2001).

Table 6.2 presents the results of applying a multinomial logit to a subset of traffic stops made by municipal police departments. As before, we test for differences across four distinct stop outcomes

for motorists of different races but who were stopped for the same reason. Across all specifications, we again find strong evidence suggesting that minority motorists are treated differently than their non-Hispanic Caucasians counterparts even when they are stopped for the same reason. For the sample of municipal stops, we find that minority motorists are more frequently given a warning and less likely to be searched relative to their non-Hispanic Caucasian counterparts. As with the overall sample, a joint hypothesis test across all the interaction terms and all outcomes indicate that the difference in outcomes is statistically significant at the 99% level for each demographic group relative to non-Hispanic Caucasians motorists.

Table 6.2: Multinomial Logistic Regression of Outcome on Race/Ethnicity and Reason for Stop, Municipal Traffic Stops 2020

	Non-White		Black		Hispanic		Black or Hispanic	
	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE
No Search, Warning or No Action								
All Other	0.09	(0.238)	0.049	(0.258)	-0.091	(0.183)	-0.029	(0.213)
Equip.	-0.032	(0.156)	-0.089	(0.168)	-0.14	(0.103)	-0.149	(0.126)
Reg. or Lic.	0.559*	(0.171)	0.56*	(0.193)	0.373*	(0.126)	0.444*	(0.141)
Signal or Stop	0.27*	(0.126)	0.275*	(0.137)	0.13	(0.087)	0.172*	(0.098)
Moving	0.439*	(0.125)	0.411*	(0.139)	0.285*	(0.127)	0.329*	(0.114)
No Search, Arrest								
All Other	0.185	(0.266)	0.127	(0.27)	-0.461*	(0.254)	-0.195	(0.214)
Equip.	0.232	(0.258)	0.206	(0.262)	-0.254	(0.261)	-0.081	(0.226)
Reg. or Lic.	1.168*	(0.351)	1.206*	(0.338)	0.249	(0.402)	0.727*	(0.335)
Signal or Stop	0.633*	(0.25)	0.698*	(0.262)	-0.216	(0.215)	0.238	(0.213)
Moving	0.028	(0.225)	0.03	(0.238)	-0.241	(0.214)	-0.16	(0.186)
Search, Ticket or Misdemeanor								
All Other	-0.562*	(0.219)	-0.68*	(0.231)	-0.594*	(0.186)	-0.633*	(0.185)
Equip.	-0.465*	(0.202)	-0.575*	(0.21)	-0.691*	(0.198)	-0.644*	(0.178)
Reg. or Lic.	-0.323	(0.276)	-0.388	(0.277)	-0.208	(0.224)	-0.3	(0.222)
Signal or Stop	-0.292	(0.299)	-0.309	(0.301)	-0.381	(0.251)	-0.337	(0.242)
Moving	-0.105	(0.246)	-0.126	(0.245)	-0.429*	(0.203)	-0.266	(0.192)
Search, Warning								
All Other	-0.03	(0.314)	-0.11	(0.329)	-0.1	(0.353)	-0.099	(0.31)
Equip.	-0.055	(0.264)	-0.163	(0.275)	-0.256	(0.25)	-0.244	(0.215)
Reg. or Lic.	0.461	(0.387)	0.345	(0.402)	-0.035	(0.33)	0.164	(0.34)
Signal or Stop	0.141	(0.256)	0.118	(0.255)	-0.221	(0.285)	-0.049	(0.241)
Moving	0.444	(0.294)	0.41	(0.299)	0.186	(0.269)	0.293	(0.245)
Search, Arrest								
All Other	-0.228	(0.25)	-0.31	(0.268)	-0.506*	(0.221)	-0.435*	(0.219)
Equip.	-0.116	(0.264)	-0.204	(0.266)	-0.405	(0.254)	-0.351	(0.233)
Reg. or Lic.	0.426	(0.291)	0.427	(0.297)	0.417	(0.27)	0.384	(0.238)
Signal or Stop	-0.046	(0.304)	-0.075	(0.301)	-0.267	(0.223)	-0.207	(0.217)
Moving	-0.328	(0.236)	-0.383	(0.249)	-0.463*	(0.212)	-0.452*	(0.192)
Chi^2	1.25E+02		1.31E+02		129.36		1.41E+02	
P-Value	0		0		0		0	
Sample Size	126,302		122,307		116,845		147,970	

Note 1: The coefficients are presented as log odds-ratios along with standard errors clustered at the department level. A coefficient concatenated with * represents a p-value of .1, ** represents a p-value of .05, and *** represents a p-value of .01 significance.

Note 2: All specifications include controls for gender, age, hour, day of the week, and week of year fixed effects.

Note 3: Q-Values were estimated using a false discovery rate procedure following Simes (1986) and later refined by Benjamini and Hochberg (1995) and Benjamini and Yekutieli (2001).

Table 6.3 presents the results of applying a multinomial logit to a subset of traffic stops made by State Police departments. Again, our goal is to test for differences across four distinct stop outcomes for motorists of different races but who were stopped for the same reason. Across all specifications, we again find evidence suggesting that minority motorists are treated differently than their non-Hispanic Caucasians counterparts. For the sample of State Police stops, we find that minority motorists are more frequently given a warning and less likely to be searched relative to their non-Hispanic Caucasian counterparts. In particular, a joint hypothesis test across all the interaction terms and all outcomes indicate that the difference in outcomes is statistically significant at the 99% level.

Table 6.3: Multinomial Logistic Regression of Outcome on Race/Ethnicity and Reason for Stop, State Police Traffic Stops 2020

	Non-White		Black		Hispanic		Black or Hispanic	
	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE
No Search, Warning or No Action								
All Other	0.25	(0.187)	0.226	(0.198)	0	(0.155)	0.114	(0.164)
Equip.	0.053	(0.118)	-0.021	(0.095)	0.068	(0.098)	0.007	(0.083)
Reg. or Lic.	0.106	(0.105)	0.081	(0.091)	0.09	(0.13)	0.049	(0.095)
Signal or Stop	-0.07	(0.113)	0.037	(0.16)	0.052	(0.182)	0.024	(0.131)
Moving	0.472*	(0.119)	0.442*	(0.123)	0.436*	(0.081)	0.427*	(0.101)
No Search, Arrest								
All Other	-0.818*	(0.182)	-0.837*	(0.163)	-0.974*	(0.428)	-0.881*	(0.259)
Equip.	-0.696	(0.587)	-0.59	(0.597)	-0.402	(0.536)	-0.437	(0.406)
Reg. or Lic.	0.343	(0.355)	0.423	(0.365)	0.234	(0.374)	0.28	(0.284)
Signal or Stop	-0.339	(0.585)	-0.784	(0.636)	-0.308	(0.638)	-0.429	(0.487)
Moving	-0.528*	(0.268)	-0.535*	(0.319)	-0.314	(0.408)	-0.386	(0.327)
Search, Ticket or Misdemeanor								
All Other	-0.522*	(0.191)	-0.592*	(0.21)	-0.667*	(0.398)	-0.684*	(0.212)
Equip.	-0.725*	(0.291)	-0.805*	(0.271)	-0.054	(0.348)	-0.417	(0.278)
Reg. or Lic.	0.709*	(0.261)	0.589*	(0.269)	0.43*	(0.175)	0.399*	(0.199)
Signal or Stop	-1.638	(1.12)	-1.555	(1.187)	-0.177	(0.508)	-0.738	(0.457)
Moving	-0.791*	(0.253)	-0.935*	(0.303)	-0.154	(0.221)	-0.521*	(0.134)
Search, Warning								
All Other	-1.757*	(0.907)	-1.826*	(0.984)	-2.105*	(0.55)	-1.917*	(0.314)
Equip.	-0.521*	(0.257)	-0.58*	(0.271)	-1.211*	(0.702)	-0.949*	(0.311)
Reg. or Lic.	-0.972*	(0.345)	-0.969*	(0.377)	-1.843*	(0.596)	-1.397*	(0.376)
Signal or Stop	0.175	(1.08)	0.362	(0.925)	-17.304*	(1.001)	-0.296	(1.122)
Moving	-0.641*	(0.263)	-0.637*	(0.296)	-0.965*	(0.505)	-0.793*	(0.278)
Search, Arrest								
All Other	-1.459*	(0.388)	-1.586*	(0.411)	-1.154*	(0.448)	-1.36*	(0.446)
Equip.	0.062	(0.617)	-0.066	(0.583)	0.335	(0.692)	0.091	(0.566)
Reg. or Lic.	0.613	(0.598)	0.588	(0.615)	0.721	(0.743)	0.615	(0.652)
Signal or Stop	-0.846	(0.704)	-1.399*	(0.511)	-0.42	(0.821)	-1.206*	(0.614)
Moving	-1.555*	(0.607)	-1.807*	(0.641)	-1.022*	(0.355)	-1.439*	(0.403)
Chi^2	4.20E+09		7.60E+09		3919.08		1.40E+08	
P-Value	0		0		0		0	
Sample Size	56,785		54,219		52,562		63,765	

Note 1: The coefficients are presented as log odds-ratios along with standard errors clustered at the department level. A coefficient concatenated with * represents a p-value of .1, ** represents a p-value of .05, and *** represents a p-value of .01 significance.
Note 2: All specifications include controls for gender, age, hour, day of the week, and week of year fixed effects.
Note 3: Q-Values were estimated using a false discovery rate procedure following Simes (1986) and later refined by Benjamini and Hochberg (1995) and Benjamini and Yekutieli (2001).

The previous set of estimates aggregate all traffic stops across multiple departments and should be considered an average effect. Although the results from this section find a statistically significant disparity in the way that minority motorists are treated by Connecticut police even after we condition on the motivating reason for the traffic stop, they do not identify the sources of that disparity in terms of specific departments or officers. The results of a department-level analysis are presented in the next section and better identify the source of specific disparities.

VI.B: DEPARTMENT ANALYSIS OF STOP DISPOSITION, 2020

The analysis presented at the state-level shows that minority motorists are treated differently, in terms of disposition, relative to their non-Hispanic Caucasians counterparts, even when they are stopped for the same reason. By construction, the aggregate analysis does not investigate the source of these disparities in terms of specific municipal police departments or State Police troops. The analysis presented in this section seeks to better identify the sources of that disparity by running the same test for individual municipal departments and State Police troops. In this section, we estimate Equation 10 of Appendix A.6 separately for each municipal department and State Police troops. Thus, each set of estimates includes a vector of town-specific controls for the hour, day of the week, and department fixed effects. We identify all departments and State Police troops found to have a disparity that is statistically significant at the 95% level in either of the Hispanic or Black alone minority groups.

Ordinarily, we would present the results from estimating the test of equality in stop dispositions for minority motorists relative to their non-Hispanic Caucasians peers in individual policing agencies. However, no department was found to have a statistically significant disparity in post-stop outcomes in 2020 according to this test. The full set of results is contained in Table F.1 of Appendix F.

VII: ANALYSIS OF VEHICULAR SEARCHES

This section contains the results of an analysis of post-stop outcomes using a hit-rate approach following Knowles, Persico and Todd (2001). The hit-rate approach relies on the idea that motorists rationally adjust their propensity to carry contraband in response to their likelihood of being searched by police. Similarly, police officers rationally decide whether to search a motorist based on visible indicators of guilt and an expectation of the likelihood that a given motorist might have contraband. According to the model, we should expect the police to search a demographic group of motorists more often than Caucasians if they were also more likely to carry contraband. However, the higher level of searches should be exactly proportional to the higher propensity of this group to carry contraband. Thus, in the absence of racial animus, we should expect the rate of successful searches (i.e. the hit-rate) to be equal across different demographic groups regardless of differences in their propensity to carry contraband.[9]

In this test, discrimination is interpreted as a preference for searching minority motorists that shows up in the data as a statistically lower hit-rate relative to Caucasian motorists. In technical terms, the testable implication derived from this model is that the equilibrium search strategy, in the absence of group bias, will result in an equalization of the rate of contraband that is found relative to the total number of searches (i.e. the hit-rate) across motorist groups. In our application, we test for the presence of a disparity in the rate of successful searches using a nonparametric test, the Pearson X^2 test. Note that this test inherently says nothing about disparate treatment in the decision to stop motorists, as it is limited in scope to vehicular searches. Our primary analysis focuses on discretionary searches which we define as those identified as consent or probable cause searches and exclude inventory searches since those are likely correlated with other offenses and race. However, we primarily identify departments based on a robustness using only consent searches. Although there is a compelling case to be made that probable cause searches involve officer discretion, these searches aren't identified explicitly in the data and the category also includes plain view searches. Plain view searches have the potential to bias the results in the same way as inventory searches since they are likely correlated with other offenses and race.

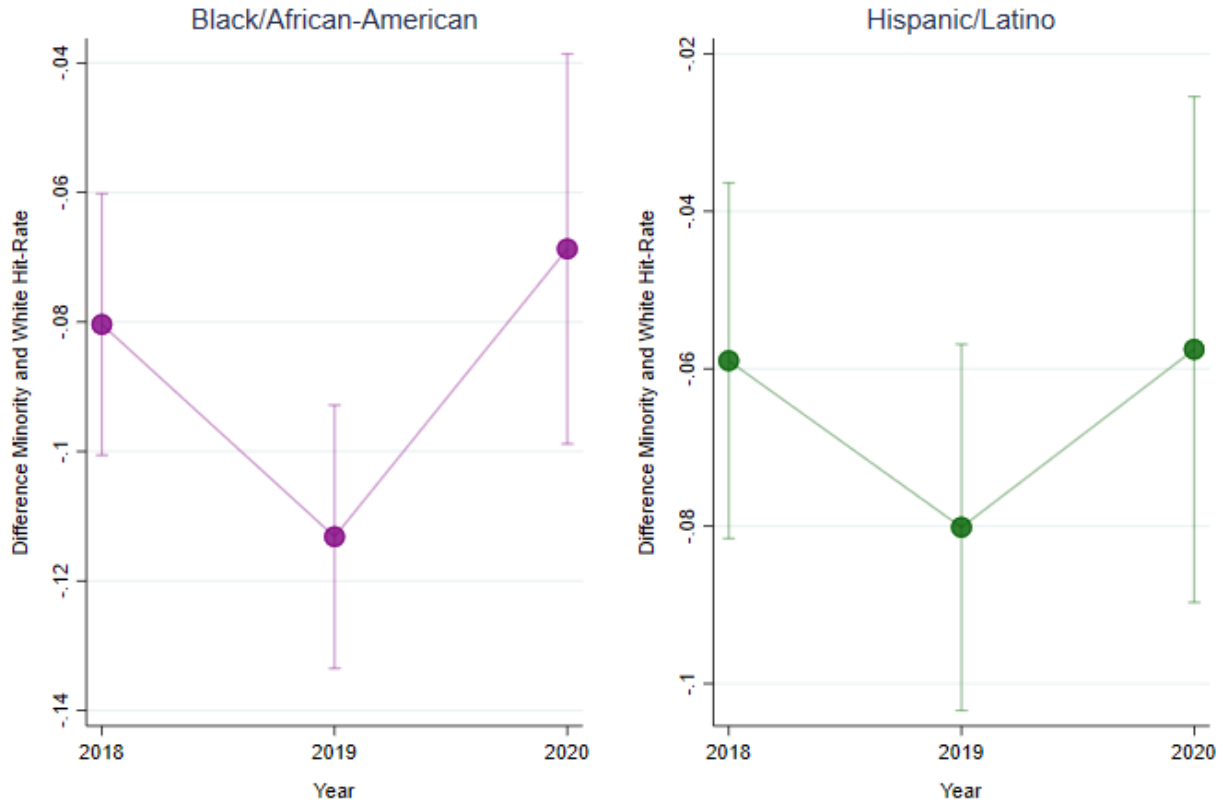
VII.A: AGGREGATE ANALYSIS WITH HIT-RATES, 2020 AND 2018-20

Figure 7.1 presents a confidence interval between the difference in the hit-rate for Black (left panel) and Hispanic (right panel) motorists using data on the outcome of probable cause and consent searches in 2018, 2019, and 2020. The vertical axis on the figure plots a 95% confidence interval around differences in the rate at which contraband is found for discretionary searches of minority motorists relative to non-Hispanic Caucasian motorists. A negative difference indicates that minorities are searched disproportionately often relative to the rate at which police actually find contraband when compared with their majority peers. Across the period 2018-20, the share of discretionary searches when contraband is found for Black motorists ranged from 37.82% to 42.47% and from 41.12% to 43.58% for Hispanic motorists. The range in both minority hit-rates stood

[9] Although some criticism has risen concerning the technique and extensions have suggested that more disaggregated groupings of searches be used in the test, the ability to implement such improvements is limited by the small overall sample of searches in a single year of traffic stops. Despite these limitations, the hit-rate analysis is still widely applied in practice and contributes to the overall understanding of post-stop police behavior in Connecticut.

dramatically lower than that for non-Hispanic Caucasians motorists which ranged from 48.43% to 49.34% over the period. The difference in the rate of successful searches between both Black and Hispanic relative to non-Hispanic Caucasian motorists was negative and highly significant at the 99% level in all years. In general, the test consistently shows a disparity in the likelihood a minority motorist is searched by police in Connecticut which is relatively large in magnitude.

Figure 7. 1: **Aggregate Hit-Rate Analysis by Year, All Discretionary Searches 2018-20**



Notes: Coefficient estimates are obtained from Table 7.1 of the 2017 and 2018 annual report as well as the 2019 estimates from the table below.

Table 7.1 contains the results of the hit-rate test formally applied to all departments in Connecticut in 2020. As seen below, the rate of successful consent and probable cause searches for non-Hispanic Caucasians motorists was 49.34% in 2020. Relative to non-Hispanic Caucasians motorists, the hit-rate for each of the four minority subgroups was lower and ranged from 42.47% to 43.58%. The difference in hit-rates for each group was statistically significant at the 99% level. In aggregate, Connecticut police departments are less successful when conducting searches of minority motorist relative to their majority peers which indicates potentially adverse treatment on the part of police.

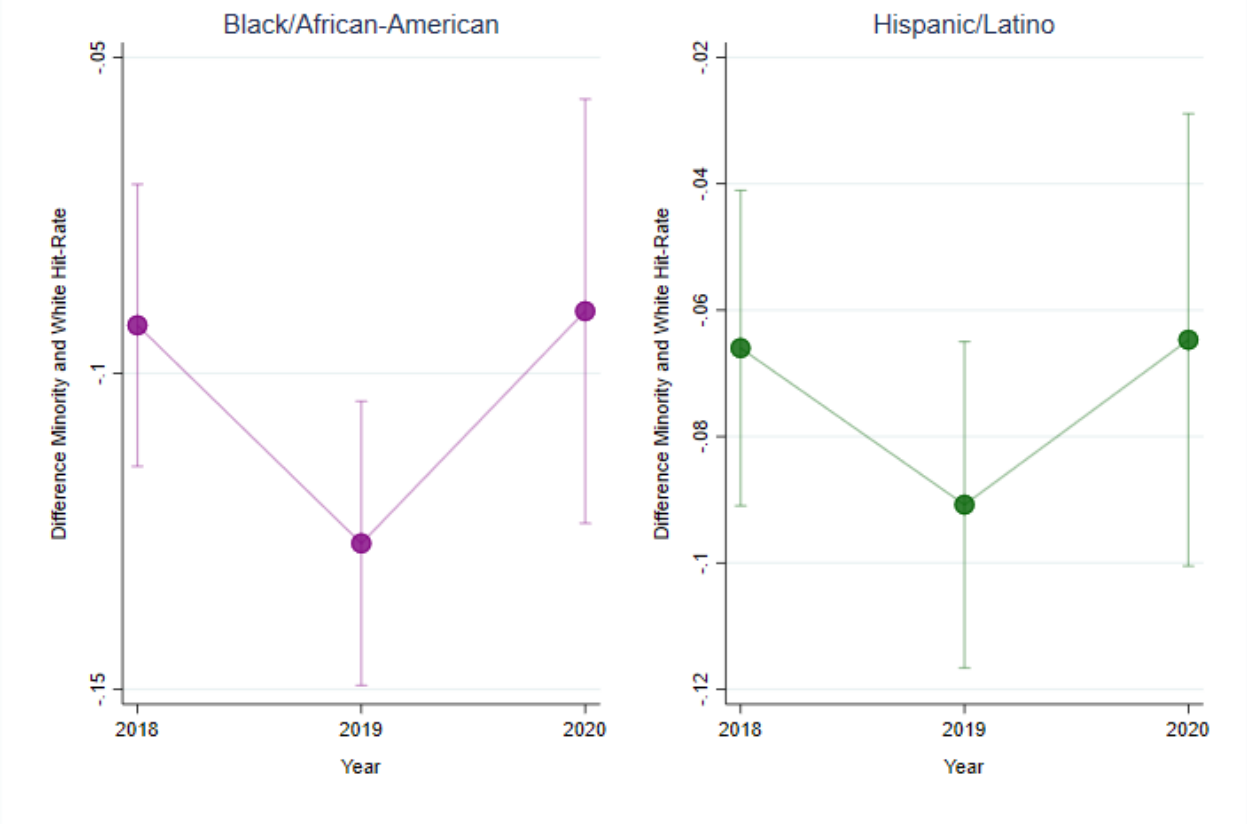
Table 7. 1: Chi-Square Test of Hit-Rate, All Discretionary Searches 2020

Variable	Caucasian	Non-Caucasian	Black	Hispanic	Black or Hispanic
Hit Rate	49.335%	42.750%***	42.465%***	43.582%***	43.006%***
Contraband	1041	908	882	713	1553
Searches	2110	2124	2077	1636	3611
Chi^2	N/A	18.486	19.899	12.255	21.525
P-Value	N/A	0.001	0.001	0.001	0.001

Notes: The coefficients are presented along with robust standard errors. A coefficient concatenated with * represents a p-value of .1, ** represents a p-value of .05, and *** represents a p-value of .01 significance. Sample includes all consent and probable cause searches in 2020.

Figure 7.2 presents a confidence interval between the difference in the hit-rate for Black (left panel) and Hispanic (right panel) motorists using data on the outcome of consent and probable cause searches for municipal departments in 2018, 2019, and 2020. As before, the vertical axis on the figure plots a 95% confidence interval around differences in the rate at which contraband is found for consent and probable cause searches of minority motorists relative to non-Hispanic Caucasian motorists. A negative difference indicates that minorities are searched disproportionately often relative to the rate at which police actually find contraband when compared with their majority peers. Across the period 2018-20, the share of consent and probable cause searches when contraband is found for Black motorists ranged from 38.53% to 43.07% and from 42.14% to 45.61% for Hispanic motorists. The range in both minority hit-rates stood dramatically lower than that for non-Hispanic Caucasians motorists which ranged from 50.30% to 52.08% over the period. As with the aggregate state level results, the results for municipal departments indicate that searches of minority motorists are more likely to be unsuccessful relative to non-Hispanic Caucasian motorists. All of disparities were significantly different than zero at a level greater than 99% confidence. In general, the test consistently shows a disparity in the likelihood a minority motorist is searched by municipal police in Connecticut.

Figure 7. 2: Aggregate Hit-Rate Analysis by Year, Municipal Discretionary Searches 2018-20



Notes: Coefficient estimates are obtained from Table 7.2 of the 2017 and 2018 annual report as well as the 2020 estimates from the table below.

Table 7.2 contains the results of the hit-rate test formally applied to all municipal departments in Connecticut in 2020. As seen below, the rate of successful consent and probable cause searches for non-Hispanic Caucasians motorists was 52.08% in 2020. Relative to non-Hispanic Caucasians motorists, the hit-rate for each of the four minority subgroups was lower and ranged from 43.07% to 45.61%. The difference in hit-rates for each group was statistically significant at the 99% level. In aggregate, Connecticut municipal police departments are less successful when conducting searches of minority motorist relative to their majority peers which indicates potential adverse treatment.

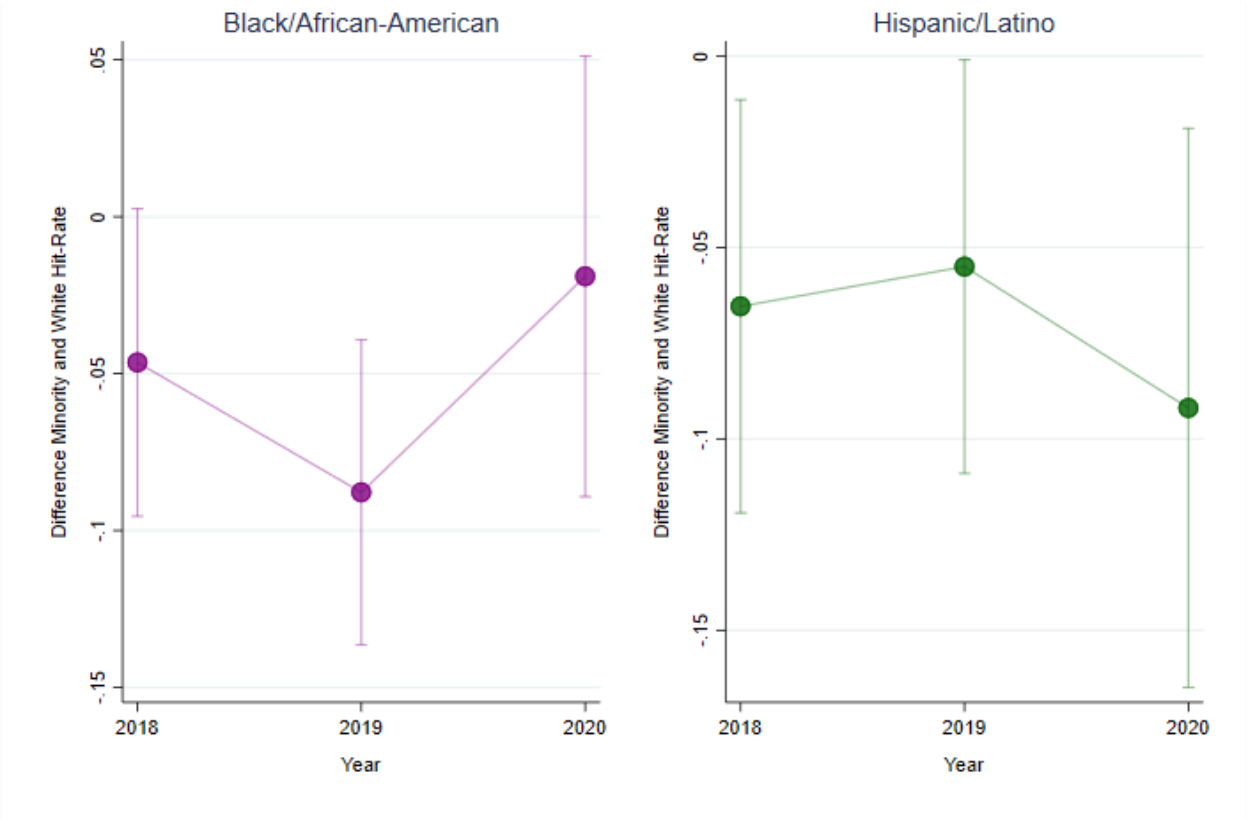
Table 7. 2: Chi-Square Test of Hit-Rate, Municipal Police Discretionary Searches 2020

Variable	Caucasian	Non-Caucasian	Black	Hispanic	Black or Hispanic
Hit Rate	52.082%	43.505%***	43.067%***	45.611%***	44.179%***
Contraband	838	787	764	634	1,366
Searches	1,609	1,809	1,774	1,390	3,092
Chi2	N/A	25.121	27.509	12.493	26.545
P-Value	N/A	0.001	0.001	0.001	0.001

Notes: The coefficients are presented along with robust standard errors. A coefficient concatenated with * represents a p-value of .1, ** represents a p-value of .05, and *** represents a p-value of .01 significance. Sample includes all discretionary searches in 2020.

Figure 7.3 presents a confidence interval between the difference in the hit-rate for Black (left panel) and Hispanic (right panel) motorists using data on the outcome of consent and probable cause searches by State Police in 2018, 2019, and 2020. As before, the vertical axis on the figure plots a 95% confidence interval around differences in the rate at which contraband is found for consent and probable cause searches of minority motorists relative to non-Hispanic Caucasian motorists. A negative difference indicates that minorities are searched disproportionately often relative to the rate at which police actually find contraband when compared with their majority peers. Across the period 2018-20, the share of consent and probable cause searches when contraband is found for Black motorists ranged from 31.87% to 38.38% and from 31.09% to 35.15% for Hispanic motorists. The range in both minority hit-rates was periodically lower than that for non-Hispanic Caucasians motorists which ranged from 39.56% to 40.65% over the period. The results for State Police indicate that searches of minority motorists were only more likely to be unsuccessful relative to non-Hispanic Caucasian for the majority of the years in the sample. The differences for these years and minority groups were significant at the 99% confidence level for all years except for Black motorists in 2018 and 2020.

Figure 7. 3: Aggregate Hit-Rate Analysis by Year, State Police Discretionary Searches 2018-20



Notes: Coefficient estimates are obtained from Table 7.3 of the 2018 and 2019 annual report as well as the 2020 estimates from the table below.

Table 7.3 contains the results of the hit-rate test formally applied to all departments in Connecticut in 2020. As seen below, the rate of successful consent and probable cause searches for non-Hispanic Caucasians motorists was 40.12% in 2020. Relative to non-Hispanic Caucasians motorists, the hit-rate for each of the four minority subgroups was lower and ranged from 32.87% to 33.27%. The

difference in hit-rates was found to be statistically significant only for Hispanic motorists. In aggregate, Connecticut State Police are less successful when conducting searches of Hispanic motorist relative to their majority peers which indicates potential adverse treatment for that group in 2020.

Table 7.3: Chi-Square Test of Hit-Rate, State Police Discretionary Searches 2020

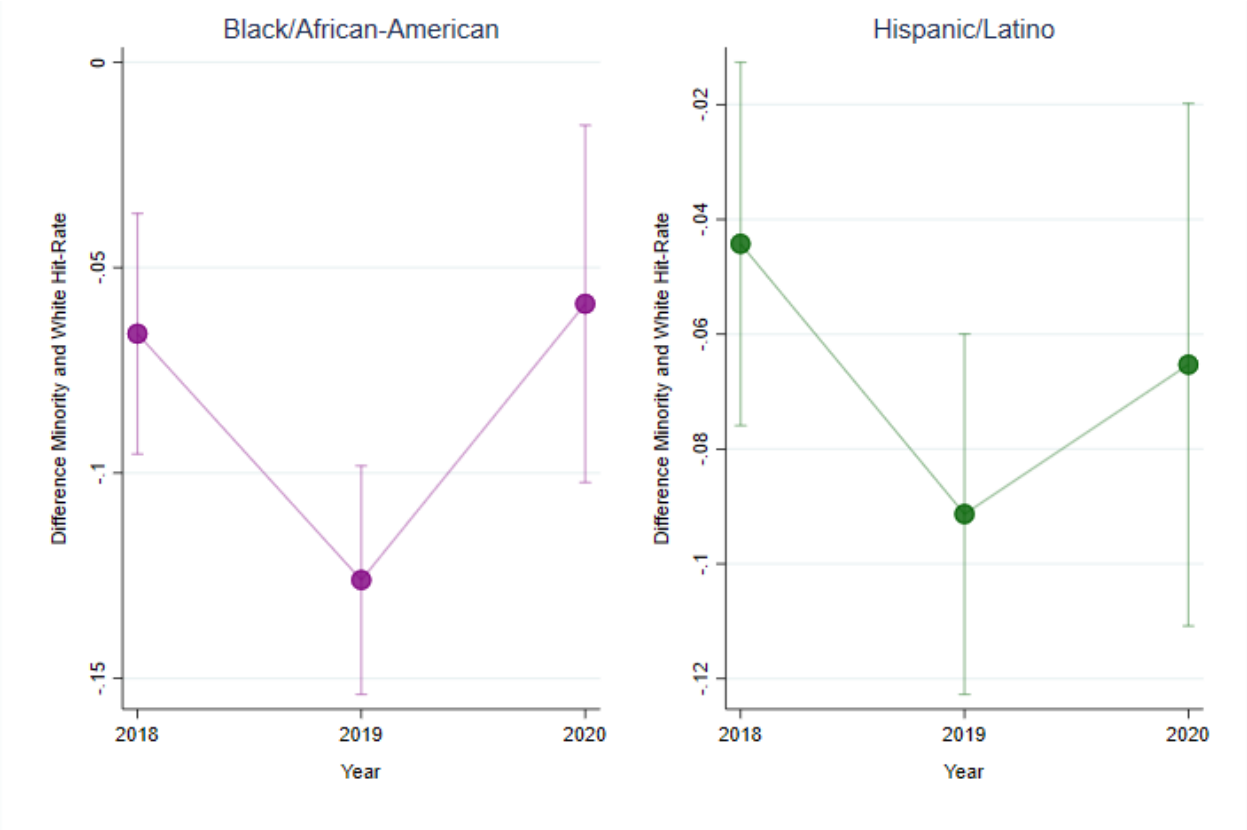
Variable	Caucasian	Non-Caucasian	Black	Hispanic	Black or Hispanic
Hit Rate	40.283%	37.863%	38.383%	31.091%**	0.35248
Contraband	199	117	114	74	178
Searches	494	309	297	238	505
Chi2	N/A	0.465	0.28	5.802	2.694
P-Value	N/A	0.495	0.597	0.016	0.101

Notes: The coefficients are presented along with robust standard errors. A coefficient concatenated with * represents a p-value of .1, ** represents a p-value of .05, and *** represents a p-value of .01 significance. Sample includes all discretionary searches in 2020.

VII.B: AGGREGATE ROBUSTNESS CHECKS WITH DISCRETIONARY SEARCHES, 2020 AND 2018-20

This section presents a robustness check on the initial specification using a more restrictive subsample of only consent searches. As mentioned, the prior analysis which probable cause searches is potentially biased against finding discrimination because these searches are not explicitly distinct in the data from plain view searches. Figure 14 presents a confidence interval between the difference in the hit-rate for Black (left panel) and Hispanic (right panel) motorists using data on the outcome of consent searches in 2018, 2019, and 2020. The vertical axis on the figure plots a 95% confidence interval around differences in the rate at which contraband is found for consent searches of minority motorists relative to non-Hispanic Caucasian motorists. A negative difference indicates that minorities are searched disproportionately often relative to the rate at which police actually find contraband when compared with their majority peers. Across the period 2018-20. The share of consent searches when contraband is found for Black motorists ranged from 19.19% to 24.85% and from 22.66% to 27.04% for Hispanic motorists. The range in both minority hit-rates stood dramatically lower than that for non-Hispanic Caucasians motorists which ranged from 29.25% to 31.79% over the period. The difference in the rate of successful searches between both Black and Hispanic relative to non-Hispanic Caucasian motorists was negative and highly significant at the 99% level in all years. In general, the test consistently shows a disparity in the likelihood a minority motorist is searched by police in Connecticut which is relatively large in magnitude.

Figure 7. 4: Aggregate Hit-Rate Analysis by Year, Consent Searches 2018-20



Notes: Coefficient estimates are obtained from Table **7.1** of the 2018 and 2019 annual report as well as the 2020 estimates from the table below.

Table 7.4 contains the results of the hit-rate test formally applied to all departments in Connecticut in 2020. As seen below, the rate of successful consent searches for non-Hispanic Caucasians motorists was 29.25% in 2020. Relative to non-Hispanic Caucasians motorists, the hit-rate for each of the four minority subgroups was lower and ranged from 22.72% to 23.656%. The difference in hit-rates for each group was statistically significant at the 99% level. In aggregate, Connecticut police departments are less successful when conducting searches of minority motorist relative to their majority peers which indicates potentially adverse treatment on the part of police.

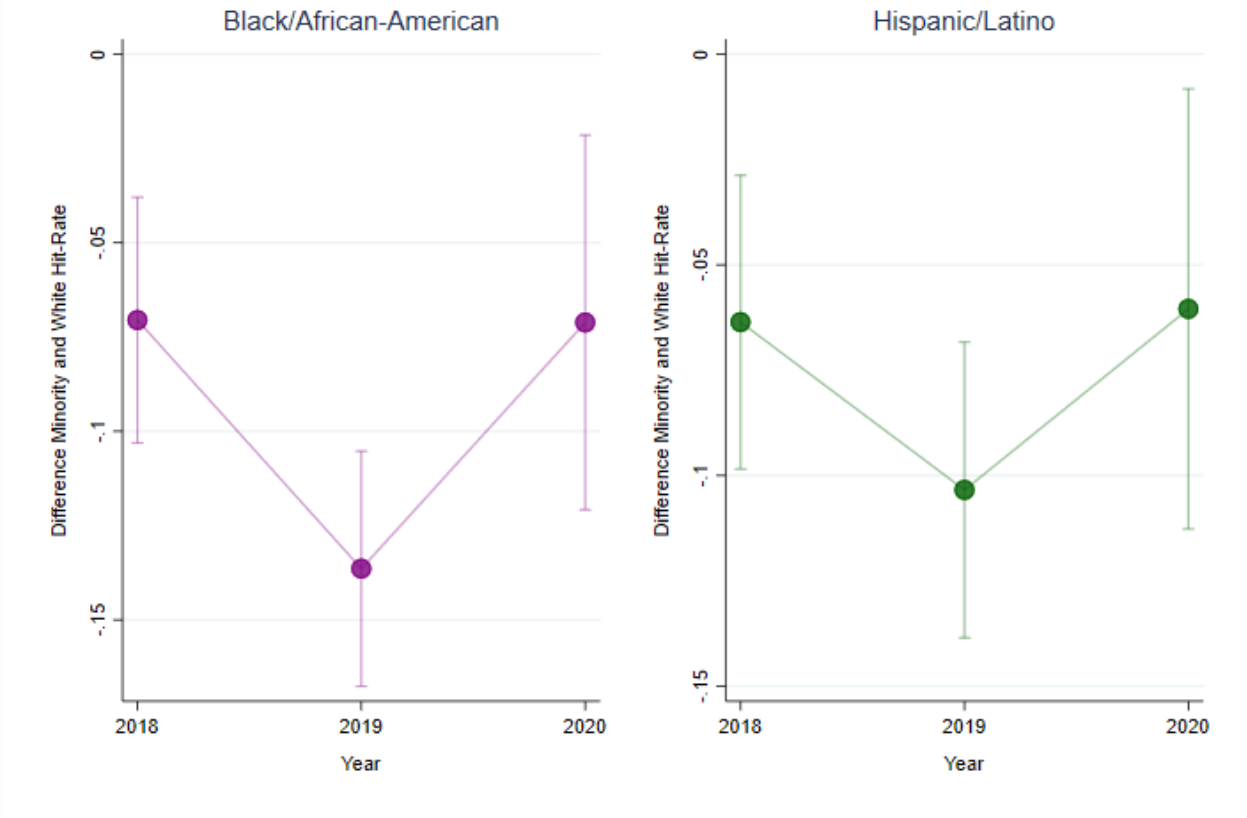
Table 7. 4: Chi-Square Test of Hit-Rate, Consent Searches 2020

Variable	Caucasian	Non-Caucasian	Black	Hispanic	Black or Hispanic
Hit Rate	29.250%	23.649%**	23.368%***	22.719%***	23.065%***
Contraband	234	184	179	142	313
Searches	800	778	766	625	1357
Chi^2	N/A	6.35	6.972	7.703	10.17
P-Value	N/A	0.012	0.008	0.006	0.001

Notes: The coefficients are presented along with robust standard errors. A coefficient concatenated with * represents a p-value of .1, ** represents a p-value of .05, and *** represents a p-value of .01 significance. Sample includes all consent searches in 2020.

Figure 7.5 presents a confidence interval between the difference in the hit-rate for Black (left panel) and Hispanic (right panel) motorists using data on the outcome of consent searches for municipal departments in 2018, 2019, and 2020. As before, the vertical axis on the figure plots a 95% confidence interval around differences in the rate at which contraband is found for consent searches of minority motorists relative to non-Hispanic Caucasian motorists. A negative difference indicates that minorities are searched disproportionately often relative to the rate at which police actually find contraband when compared with their majority peers. Across the period 2018-20. The share of consent searches when contraband is found for Black motorists ranged from 18.55% to 24.41% and from 21.85% to 25.10% for Hispanic motorists. The range in both minority hit-rates stood dramatically lower than that for non-Hispanic Caucasians motorists which ranged from 29.70% to 32.19% over the period. As with the aggregate state level results, the results for municipal departments indicate that searches of minority motorists are more likely to be unsuccessful relative to non-Hispanic Caucasian motorists. All of disparities were significantly different than zero at a level greater than 99% confidence. In general, the test consistently shows a disparity in the likelihood a minority motorist is searched by municipal police in Connecticut.

Figure 7. 5: Aggregate Hit-Rate Analysis by Year, Municipal Consent Searches 2018-20



Notes: Coefficient estimates are obtained from Table 7.2 of the 2018 and 2019 annual report as well as the 2020 estimates from the table below.

Table 7.5 contains the results of the hit-rate test formally applied to all municipal departments in Connecticut in 2020. As seen below, the rate of successful consent searches for non-Hispanic Caucasian motorists was 29.70% in 2020. Relative to non-Hispanic Caucasians motorists, the hit-rate for each of the four minority subgroups was lower and ranged from 22.58% to 23.65%. The

difference in hit-rates for each group was statistically significant at the 99% level. In aggregate, Connecticut municipal police departments are less successful when conducting searches of minority motorist relative to their majority peers which indicates potential adverse treatment.

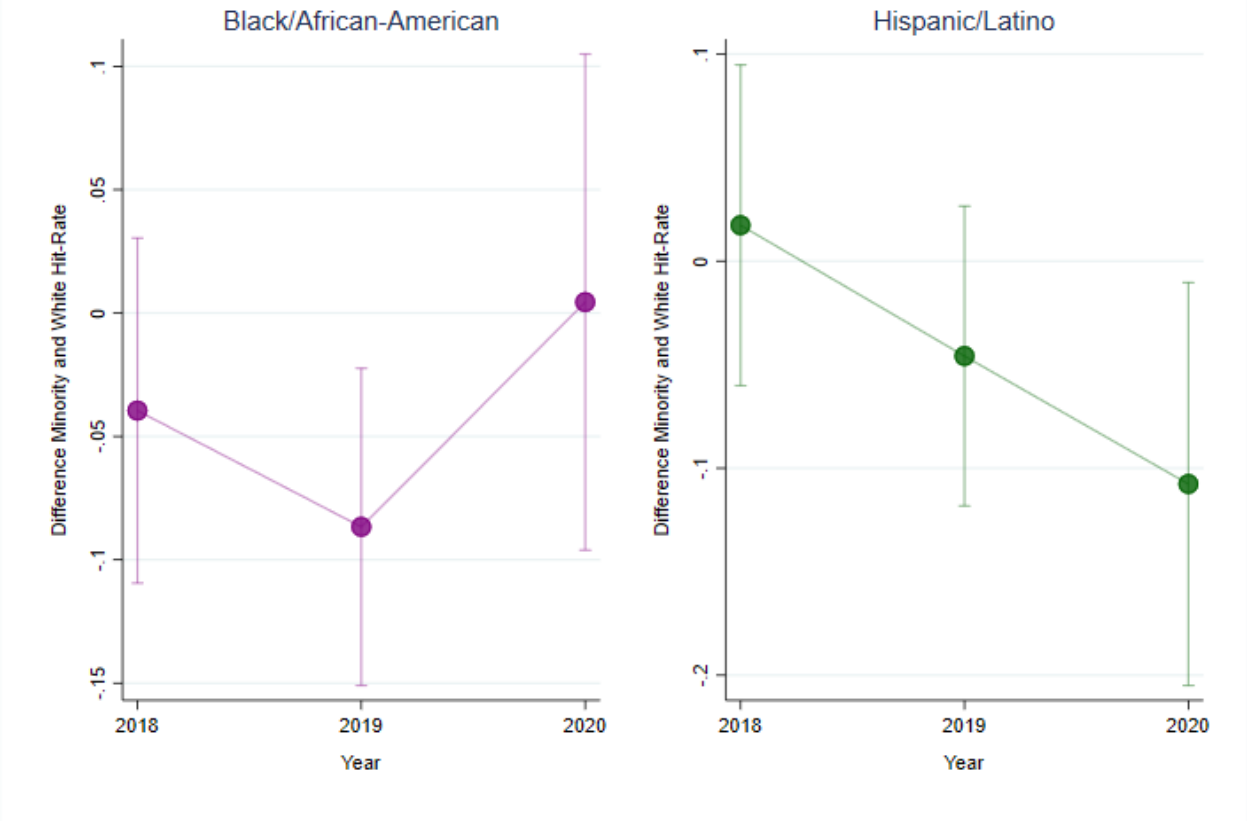
Table 7. 5: Chi-Square Test of Hit-Rate, Municipal Consent Searches 2020

Variable	Caucasian	Non-Caucasian	Black	Hispanic	Black or Hispanic
Hit Rate	29.695%	22.947%***	22.580%***	23.649%**	22.917%***
Contraband	166	151	147	127	267
Searches	559	658	651	537	1,165
Chi^2	N/A	7.144	7.94	5.111	9.225
P-Value	N/A	0.008	0.004	0.024	0.002

Notes: The coefficients are presented along with robust standard errors. A coefficient concatenated with * represents a p-value of .1, ** represents a p-value of .05, and *** represents a p-value of .01 significance. Sample includes all consent searches in 2020.

Figure 7.6 presents a confidence interval between the difference in the hit-rate for Black (left panel) and Hispanic (right panel) motorists using data on the outcome of consent searches by State Police in 2018, 2019, and 2020. As before, the vertical axis on the figure plots a 95% confidence interval around differences in the rate at which contraband is found for consent searches of minority motorists relative to non-Hispanic Caucasian motorists. A negative difference indicates that minorities are searched disproportionately often relative to the rate at which police actually find contraband when compared with their majority peers. Across the period 2018-20, the share of consent searches when contraband is found for Black motorists ranged from 20.07% to 27.68% and from 16.47% to 29.19% for Hispanic motorists. The range in both minority hit-rates was periodically lower than that for non-Hispanic Caucasians motorists which ranged from 27.23% to 28.74% over the period. The results for State Police indicate that searches of minority motorists were only more likely to be unsuccessful relative to non-Hispanic Caucasian motorists in 2019 (Black) and 2020 (Hispanic). The differences for these years and minority groups were significant at the 99% confidence level while the remaining estimates were statistically indistinguishable from zero.

Figure 7. 6: Aggregate Hit-Rate Analysis by Year, State Police Consent Searches 2018-20



Notes: Coefficient estimates are obtained from Table 30 of the 2018 and 2019 annual report as well as the 2020 estimates from the table below.

Table 7.6 contains the results of the hit-rate test formally applied to all departments in Connecticut in 2020. As seen below, the rate of successful consent searches for non-Hispanic Caucasians motorists was 27.23% in 2020. Relative to non-Hispanic Caucasians motorists, the hit-rate for each of the four minority subgroups was lower and ranged from 16.47% to 27.68%. The difference in hit-rates was found to be statistically significant only for Hispanic motorists. In aggregate, Connecticut State Police are less successful when conducting searches of Hispanic motorist relative to their majority peers which indicates potential adverse treatment for that group in 2020.

Table 7. 6: Chi-Square Test of Hit-Rate, State Police Consent Searches 2020

Variable	Caucasian	Non-Caucasian	Black	Hispanic	Black or Hispanic
Hit Rate	27.233%	27.350%	27.679%	16.471%**	23.656%
Contraband	64	32	31	14	44
Searches	235	117	112	85	186
Chi^2	N/A	0.001	0.008	3.923	0.697
P-Value	N/A	0.981	0.93	0.048	0.404

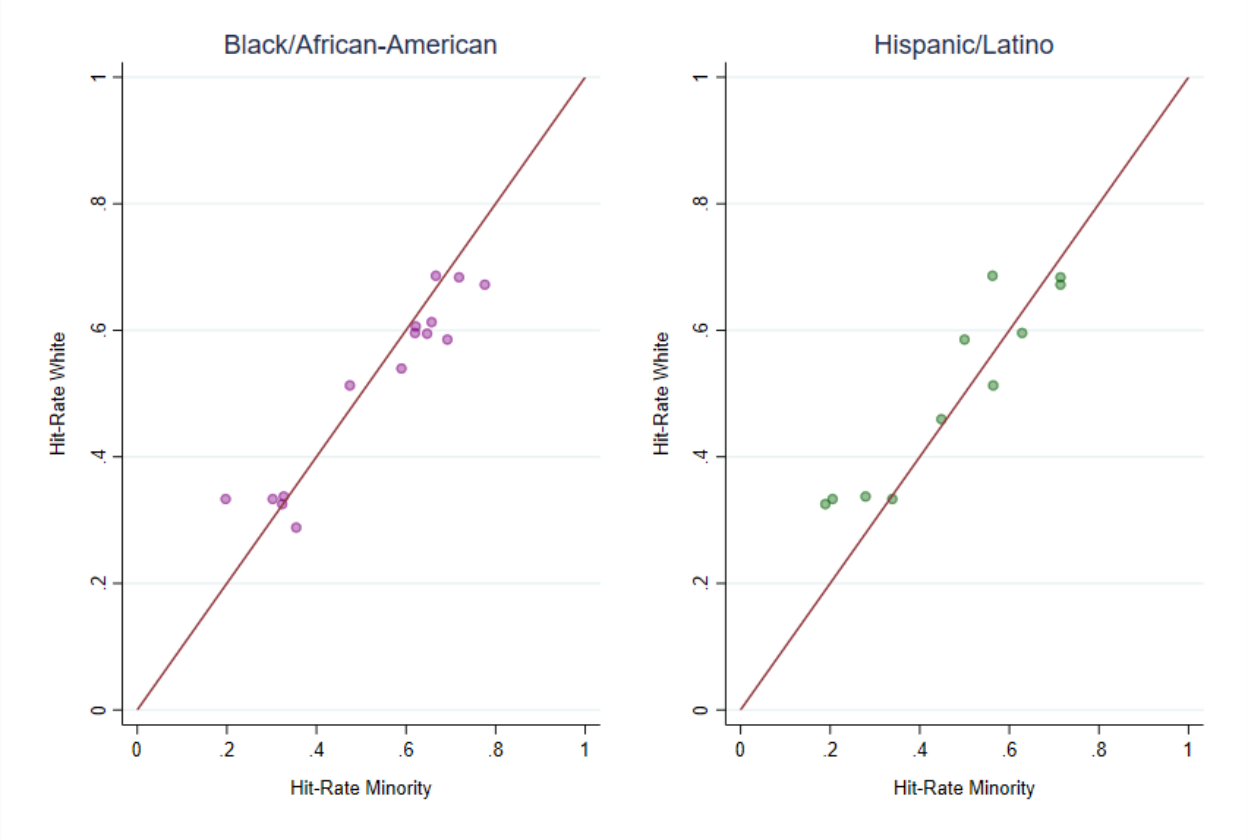
Notes: The coefficients are presented along with robust standard errors. A coefficient concatenated with * represents a p-value of .1, ** represents a p-value of .05, and *** represents a p-value of .01 significance. Sample includes all consent searches in 2020.

VII.C: DEPARTMENT ANALYSIS WITH HIT-RATES, 2020 AND 2018-20

The analysis presented for Connecticut police as a whole showed that the likelihood a police search of a minority results in contraband being found is significantly lower relative to searches of their non-minority peers. In this subsection, differences in hit-rates are estimated independently for each municipal department and State Police troop. We graphically present estimate of the hit-rate test separately for each municipal department and State Police troop. We first provide results for the 2020 sample of the data as we have done in the prior three reports. However, we also leverage the full three-year sample from 2018-20 and graphically present estimates of the effect of daylight for smaller departments which previously had an insufficiently small sample to run the test annually. In this test, it is necessary to restrict the sample to only motorists stopped and subsequently searched by police. However, this restriction significantly reduces the estimation power in small samples. In the figures and discussion below, we highlight only the departments found to have a statistically significant disparity in the Black or Hispanic alone categories for either the 2020 or combined 2018-20 samples. Identification requires that departments and State Police troops have a disparity that is statistically significant at or above the 95% level in either of the Hispanic or Black alone minority groups. Further, we only highlight departments that have a false discovery rate below 10% in both specifications. We provide the full set of results in Tables G.1, G.2, G.3, and G.4 of Appendix G.

Figure 7.7 plots the likelihood a Black (left panel) or Hispanic (right panel) motorist is searched by police relative to their non-Hispanic Caucasian peers. Individual points on the figure represent specific municipal departments and State Police troops. The vertical axis plots the likelihood that a discretionary search of a non-Hispanic Caucasian motorist results in contraband being found and the horizontal axis plots the same likelihood for minority motorists. The red 45-degree line represents parity (equal treatment) between police searches of minorities and non-Hispanic Caucasians. Thus, only departments falling above this line (top left quadrant) are more likely to search minority motorists relative to non-minorities. We annotate only those departments where the difference is statistically significant at or above the 95% confidence level in the main specification and with a false discovery rate below 10%. The full results are contained in Table G.1 of Appendix G. Applying this test to the 2020 data, we do not identify any departments. It is worth noting that this is largely due to the fact that the overall sample of searches was extremely small in 2020 likely due to the COVID 19 pandemic.

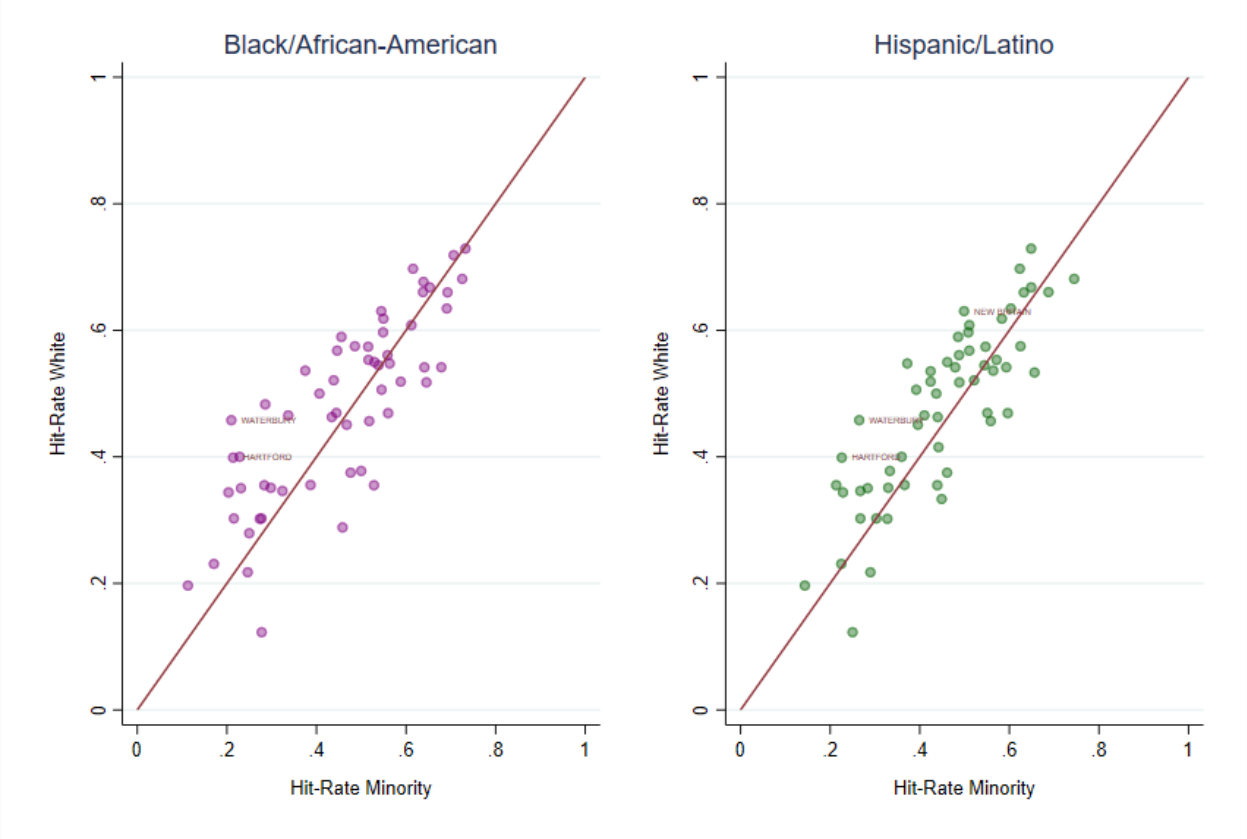
Figure 7. 7: Hit Rate Analysis by Department, All Discretionary Searches 2020



Notes: Hit-rates are obtained from Table G.1 of Appendix G. Annotated departments include only those with a statistically significant disparity estimated non-parametrically with a confidence level at or exceeding the 95% in the combined sample of discretionary searches. Identified departments also had a false discovery rate below 10% estimated following Simes (1986), Benjamini and Hochberg (1995), and Benjamini and Yekutieli (2001).

As discussed, there are too few searches for this test to be applied to a single year of data for many small departments. Thus, Figure 7.8 plots the likelihood a Black (left panel) or Hispanic (right panel) motorist is searched by police relative to their non-Hispanic Caucasian peers in a combined three-year sample. The full results are contained in Table G.2 of Appendix G. Applying this test to the 2018-20 data, we identify State Police State Police Troop G (Black) and Hartford (Black and Hispanic). We also note that State Police Troop C were actually less likely to be successful at searching non-Hispanic Caucasian motorists relative to Black motorists. All of these results were statistically significant at a level exceeding 95% confidence and had a false discovery rate below 10%.

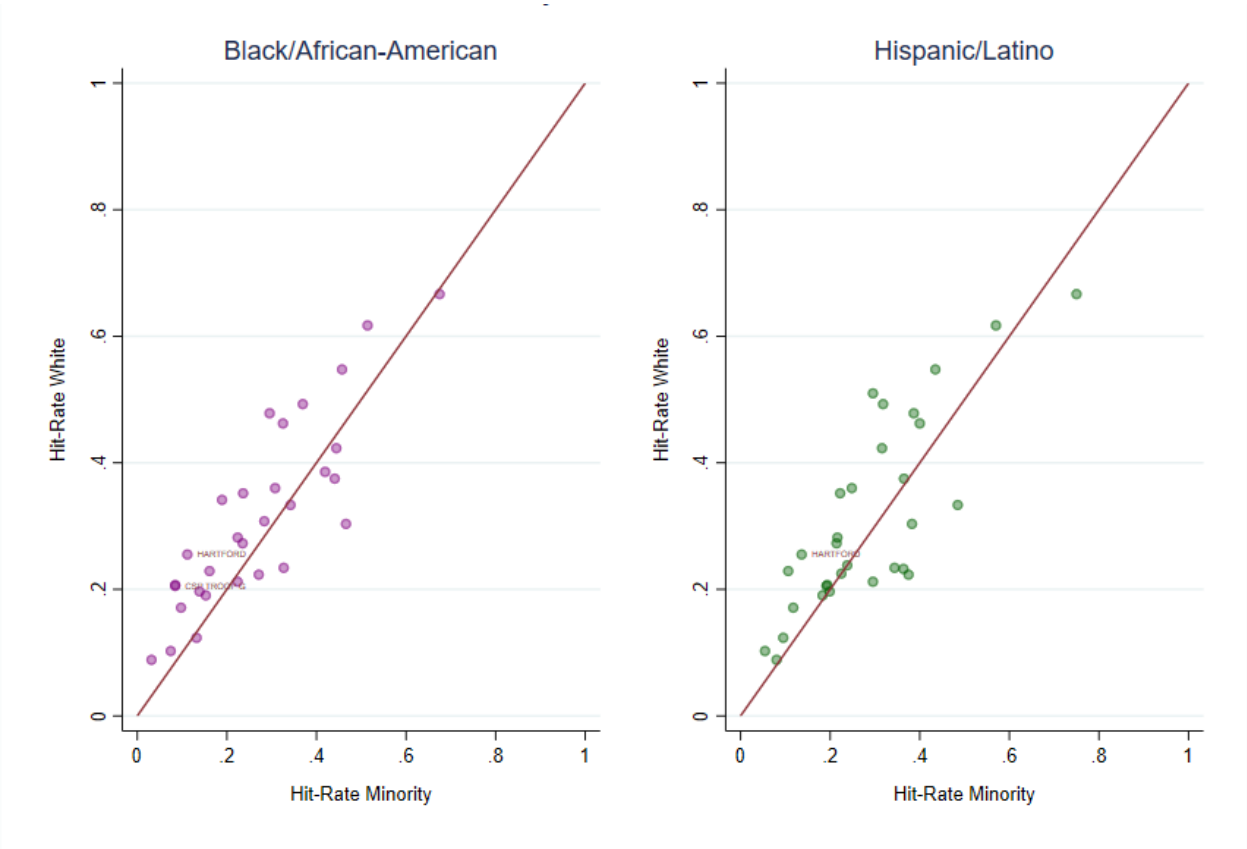
Figure 7. 8: Hit Rate Analysis by Department, All Discretionary Searches 2018-20



Notes: Hit-rates are obtained from Table G.2 of Appendix G. Annotated departments include only those with a statistically significant disparity estimated non-parametrically with a confidence level at or exceeding the 95% in the combined sample of discretionary searches. Identified departments also had a false discovery rate below 10% estimated following Simes (1986), Benjamini and Hochberg (1995), and Benjamini and Yekutieli (2001).

Ordinarily, we would plot the likelihood a Black or Hispanic motorist is searched, consent only, by police relative to their non-Hispanic Caucasian peers. However, there was not a large enough sample in any department during 2020 to estimate a hit-rate on this subsample of searches. However, Figure 7.9 plots the likelihood a Black (left panel) or Hispanic (right panel) motorist is searched (consent only) by police relative to their non-Hispanic Caucasian peers. Individual points on the figure represent specific municipal departments and State Police troops. The full results are contained in Table G.4 of Appendix G. Applying this test to the 2018-20 data, we identify Hartford (Black & Hispanic) and State Police Troop G (Black) as being statistically less likely to find contraband when searching Black relative to non-Hispanic Caucasian motorists. The results for Hartford were statistically significant at a level exceeding 95% confidence and had a false discovery rate below 10%. The results for Hartford survive subsequent robustness checks that restrict the sample to only consent searches.

Figure 7. 9: Hit Rate Analysis by Department, Consent Searches 2018-20



Notes: Hit-rates are obtained from Table G.4 of Appendix G. Annotated departments include only those with a statistically significant disparity estimated non-parametrically with a confidence level at or exceeding the 95% in the combined sample of discretionary searches. Identified departments also had a false discovery rate below 10% estimated following Simes (1986), Benjamini and Hochberg (1995), and Benjamini and Yekutieli (2001).

VIII: FINDINGS FROM THE 2020 AND 2018-20 ANALYSIS

This section represents a summary of the findings from both the annual analysis of traffic stops conducted between January 1, 2020 and December 31, 2020 and the 2018 to 2020 three-year aggregate analysis between January 1, 2018 and December 31, 2020.

VIII.A: AGGREGATE FINDINGS FOR CONNECTICUT, 2020 AND 2018-20

Municipal and State Police departments in Connecticut made only 247,934 traffic stops in 2020 (1,263,440 in 2018-20) of which 60% (63%) were of White non-Hispanic motorists while 19% (17.8%) were Black and 17% (15.8%) were of Hispanic motorists. At the aggregate level, we present estimates from applying the veil of darkness analysis, a search hit-rate analysis, and a post-stop disposition analysis. The veil of darkness analysis exploits quasi-random variation in the timing of sunset to identify potential discrimination in the decision to stop a motorist. According to the results from applying this test, the estimated change from daylight to darkness in the odds a stopped motorist is a Black was 0.96 in 2018, 0.97 in 2019, and 0.97 in 2020. The change from daylight to darkness in the odds a stopped motorist is Hispanic was 1.06 in 2018, 1.06 in 2019, and 1.04 in 2020. In general, the disparity in the decision to stop a minority motorist has remained relatively stable in terms of magnitude and statistical precision from 2018 through 2020.

The key identifying assumption of this test is that police officers who are inclined to racially profile motorists are better able to do so during daylight when motorist race is more easily observed prior to making a traffic stop. Following this logic, the results suggest that police in Connecticut are more likely to stop a Hispanic motorist in daylight relative to darkness which is indicative of potential adverse treatment. We also find evidence that Black motorists are actually less likely to be stopped by police in daylight. However, Kalinowski et al. (2021) suggest that a statistically significant finding of "reverse discrimination" (i.e. a disparity for White non-Hispanic motorists) may also be consistent with bias against minorities if they are adjusting their driving behavior to avoid detection by police during daylight. Without additional analysis examining changes in driving behavior by minority motorists, it is difficult to interpret the aggregate results for Black motorists.

In 2020, Municipal and State Police departments in Connecticut also conducted a total of only 8,199 (3.3%) motor vehicle searches of which 37% were of non-Hispanic Caucasian motorists while 33% were of Black and 29% were of Hispanic motorists. At the aggregate level, we present estimates comparing the likelihood a search resulted in contraband being found for non-Hispanic Caucasian motorists relative to minority motorists. In addition, we compare the disposition of traffic stops across these groups after conditioning on the motivating reason for the traffic stop. The rate at which discretionary searches of non-Hispanic Caucasian motorists yielded contraband was 42.4 % in 2018, 41.5% in 2019, and 40.8% in 2020. The rate at which searches of Black and Hispanic motorists yielded contraband was 36.4% and 34.4% respectively in 2018, 34.4% and 33.3% respectively in 2019, and 37.3% and 37.1% respectively in 2020. The key identifying assumption of this test is that police will search minority motorists more often than whites but only relative to their expected likelihood of carrying contraband. Thus, the significant lower hit-rate for minority motorists suggests the potential presence of a preference on the part of police for searching minority motorist. Similarly, the stop disposition analysis suggests minority motorists are more likely to receive a warning and less likely to be searched overall even after condition on the motivating reason for the stop. The post-

stop analysis did not identify any individual departments in the department-level analysis in 2020. However, the disparity in the decision to search a minority motorist has remained relatively stable in magnitude and statistical precision from 2018 through 2020.

VIII.B: VEIL OF DARKNESS ANALYSIS FINDINGS, 2020 AND 2018-20

In an effort to better identify the source of these racial and ethnic disparities, each analysis was repeated at the department level for both the 2020 calendar year and the 2018 to 2020 aggregate sample. The threshold for identifying individual departments was the presence of a disparity that was statistically significant at the 95 percent level in the Black or Hispanic alone categories.[10] By construction, the departments that were identified as having a statistically significant disparity are the largest contributors to the overall statewide results. Here, the unit of analysis is a municipal department or State Police Troop where disparities could be a function of a number of factors including institutional culture, departmental policy, or individual officers.[11]

In total, we identify three State Police Troops, one in the 2020 sample only, one in both the 2020 sample and the three-year aggregate sample, and one in the three-year aggregate sample only. We also identified two municipal police departments in the three-year aggregate sample. Of the two municipal police departments identified in the three-year aggregate sample, one department was identified in a previous annual study. For all departments identified in either the 2020 or three-year aggregate samples, we conclude that there is strong evidence that a disparity exists in the rate of minority traffic stops made during daylight conditions. These departments include:

State Police Headquarters

State Police Headquarters was identified on the veil of darkness analysis in 2020 sample for Black motorists. The veil of darkness analysis exploits quasi-random variation in visibility to identify potential discrimination controlling for day of week and time of day. During the sample window for this test, the odds a stopped motorist was Black totaled 0.246 in darkness when we presume that police are less able to detect the race of a motorist prior to making a traffic stop. Conditioning on day of the week and time of day, the odds a stopped motorist was Black grew to 0.453 during daylight when we presume that police are better able to detect race.

State Police Troop D

State Police Troop D was identified on the veil of darkness analysis in the 2020 sample and combined 2018-20 sample for Black motorists. The veil of darkness analysis exploits quasi-random variation in visibility to identify potential discrimination controlling for day of week and time of day. During the 2020 sample window for this test, the odds a stopped motorist was Black totaled 0.077 in darkness when we presume that police are less able to detect the race of a motorist prior to making a traffic stop. Conditioning on day of the week and time of day, the odds a stopped motorist was Black grew to 0.122 during daylight when we presume

[10] Put simply, there must have been at least a 95 percent chance that the motorists were more likely to be stopped at a higher rate relative to white Non-Hispanic motorists.

[11] Since department or state police barrack estimates represent an average effect of stops made by individual officers weighted by the number of stops that they made in 2018, it is possible that officer-level disparities exist in departments which were not identified.

that police are better able to detect race. During the combined 2018-20 sample window for this test, the odds a stopped motorist was Black totaled 0.060 in darkness when we presume that police are less able to detect the race of a motorist prior to making a traffic stop. Conditioning on day of the week and time of day, the odds a stopped motorist was Black grew to 0.086 during daylight when we presume that police are better able to detect race.

State Police Troop L

State Police Troop L was identified on the veil of darkness analysis in the combined 2018-20 sample for Hispanic motorists. The veil of darkness analysis exploits quasi-random variation in visibility to identify potential discrimination controlling for day of week and time of day. During the sample window for this test, the odds a stopped motorist was Hispanic totaled 0.078 in darkness when we presume that police are less able to detect the race of a motorist prior to making a traffic stop. Conditioning on day of the week and time of day, the odds a stopped motorist was Hispanic grew to 0.116 during daylight when we presume that police are better able to detect race.

Middletown:

Middletown was identified on the veil of darkness analysis in the combined 2018-20 sample for Hispanic motorists. The veil of darkness analysis exploits quasi-random variation in visibility to identify potential discrimination controlling for day of week and time of day. During the sample window for this test, the odds a stopped motorist was Hispanic totaled 0.163 in darkness when we presume that police are less able to detect the race of a motorist prior to making a traffic stop. Conditioning on day of the week and time of day, the odds a stopped motorist was Hispanic grew to 0.246 during daylight when we presume that police are better able to detect race.

Ridgefield:

Ridgefield was identified on the veil of darkness analysis in the combined 2018-20 sample for Black motorists. The veil of darkness analysis exploits quasi-random variation in visibility to identify potential discrimination controlling for day of week and time of day. During the sample window for this test, the odds a stopped motorist was Black totaled 0.053 in darkness when we presume that police are less able to detect the race of a motorist prior to making a traffic stop. Conditioning on day of the week and time of day, the odds a stopped motorist was Black grew to 0.120 during daylight when we presume that police are better able to detect race.

VIII.C: OTHER STATISTICAL AND DESCRIPTIVE MEASURE FINDINGS, 2020 AND 2018-20

In addition to the two municipal police departments and three State Police troops identified to exhibit statistically significant racial or ethnic disparities in the Veil of Darkness analysis, a number of other departments were identified using either the descriptive tests, stop disposition test or KPT hit-rate analysis. Identification in any one of these tests alone is not, in and of itself, sufficient to be identified for further analysis. However, these additional tests are designed as an additional screening tool to identify the jurisdictions where consistent disparities exceed certain thresholds that appear in the

data. Although it is understood that certain assumptions have been made in the design of each of these measures, it is reasonable to believe that departments with consistent data disparities that separate them from the majority of other departments should be subject to further review and analysis with respect to the factors that may be causing these differences. Synthetic Control Analysis

The results from estimating whether individual departments stopped more minority motorists relative to their requisite synthetic control found 24 municipal police departments, and 3 State Police troops to have a disparity that was statistically significant at the 95 percent level in the Black or Hispanic alone categories and withstood doubly-robust estimation, and had a false discovery rate below 10%. *Bridgeport, Cheshire, State Police Troop H, East Haven, Meriden, Newington, North Haven, Orange, Wallingford, Waterford, Wethersfield,* and *Wolcott* were identified in the 2020 sample and the aggregate 2018 to 2020 sample. *Berlin, State Police Troop G, State Police Troop I, Hamden, New Britain, New Haven, Ridgefield,* and *South Windsor* were identified only in the 2020 sample. Lastly, *Avon, Brookfield, Easton, Farmington, Groton Town, Plainville,* and *Stonington* were identified only in the three-year aggregate analysis.

Descriptive Statistics Analysis:

The descriptive tests are designed as an additional tool to identify disparities that exceed certain thresholds that appear in a series of census-based benchmarks. Those three benchmarks are: (1) statewide average, (2) the estimated commuter driving population, and (3) resident-only stops. Although 71 municipal police departments were identified with racial and ethnic disparities when compared to one or more of the descriptive measures, only *Stratford, Meriden, Newington, Windsor Locks, New Britain, Waterbury, Vernon, West Hartford, Wolcott, Woodbridge, East Hartford, Wethersfield, Norwich, Orange,* and *South Windsor* exceeded the disparity threshold in more than half the benchmark areas.

Stop Disposition Analysis:

In aggregate, minority motorists stopped by police departments were found to have a statistically different distribution of outcomes conditional on the basis for which they were stopped. However, in the departmental analysis, there were no departments found to have a statistically significant disparity in post-stop outcomes in 2020.

KPT Hit-Rate Analysis:

The results of this test, applied to the aggregate search data for all departments in Connecticut show that departments are less successful in motorist searches across all minority groups, which is a potential indicator of disparate treatment. There was no municipal police departments or State Police Troops found to have a disparity in the hit-rate of minority motorists relative to White non-Hispanics motorists for the 2020 sample. It is worth noting that this is largely due to the fact that the overall sample of searches was extremely small in 2020 likely due to the COVID 19 pandemic. In the combined 2018-20 aggregate sample, there was one municipal police department and one State Police troop found to have a disparity in the hit-rate of minority motorists relative to White non-Hispanic motorists. Both departments survived the robustness test for the three-year aggregate sample. The one municipal department and one State Police Troop identified to exhibit a statistically significant racial or ethnic disparity in searches across all robustness tests were:

State Police Troop G:

State Police Troop G was identified on the search hit-rate analysis in the combined 2018-20 sample for Black motorists. This analysis compares the rate at which searched minority motorists are actually found with contraband to the same majority rate. In the data, contraband was found in only 8.451% of Black discretionary searches. Relative to the 20.535% of non-Hispanic Caucasian motorists, searches of minority motorists were less successful and suggestive of potential adverse treatment.

Hartford:

Hartford was identified on the search hit-rate analysis in the combined 2018-20 sample for both Black and Hispanic motorists. This analysis compares the rate at which searched minority motorists are actually found with contraband to the same majority rate. In the data, contraband was found in only 11 % of Black and 14% of Hispanic discretionary searches. Relative to the 25% of non-Hispanic Caucasian motorists, searches of minority motorists were less successful. The results unambiguously indicate that Hartford police is disproportionately less likely to be successful searching minority motorists relative to their White non-Hispanic peers.

VIII.D: FOLLOW-UP ANALYSIS

The entirety of chapters III through VII of this report should be utilized as a screening tool by which researchers, law enforcement administrators, community members and other appropriate stakeholders focus resources on those departments displaying the greatest level of disparities in their respective stop data. As noted previously, racial and ethnic disparities in any traffic stop analysis do not, by themselves, provide conclusive evidence of racial profiling. Statistical disparities do, however, provide significant evidence of the presence of idiosyncratic data trends that warrant further analysis.

In order to determine if a departments racial and ethnic disparities warrant additional in-depth analysis, researchers review the results from some of the analytical sections of the report. The threshold for identifying significant racial and ethnic disparities for departments is described in each section of the report (ex. departments with a disparity that was statistically significant at the 95 percent level in the black or Hispanic alone categories in the Veil of Darkness methodology were identified as statistically significant). A department is identified for a follow-up analysis if they meet any one of the following criteria:

3. A statistically significant disparity in the one-year or three-year Veil of Darkness analysis
4. A statistically significant disparity in the one-year or three-year KPT hit rate and Stop Disposition analyses

It is worth noting that past reports have relied on results from the Synthetic Control method and Descriptive Statistics to identify departments for additional analysis. Although results from those methods are provided in the report, the authors believe that since 2010 census information forms much of the foundation of these measures, it would be better appropriate to limit the use of these tests until 2020 census data has been fully incorporated into the analysis. The authors also believe that the inclusion of a three-year aggregate analysis significantly improves our ability to utilize the more sophisticated statistical techniques, especially on departments with small annual sample sizes.

Improvements have also been made to the post-stop measures to make them more rigorous and statistically sound.

In general, we continue to identify far fewer departments in this report relative to prior year's studies with only two municipal departments and three State Police troops. Of the two municipal departments, all were identified in the three-year aggregate sample only. One of the three State Police Troops was only identified in the combined 2018-20 sample and the two other State Police Troops were identified in both the 2020 sample and the combined 2018-20 sample. Based on the above listed criteria it is recommended that an in-depth follow-up analysis should be conducted for the **Middletown** police department.

In addition to being identified with racial and ethnic disparities in this study, the **Ridgefield** (2018-20 sample) police department was identified with racial and ethnic disparities in the 2019 Traffic Stop Data Analysis and Findings report and the 2015-16 Traffic Stop Data Analysis and Findings report. An in-depth analysis, with recommendations, was completed and published as part of the 2015-16 Traffic Stop Data Analysis and Findings Supplemental report released in October 2018. The follow-up analysis and subsequent departmental interventions were not completed until the end of 2018. Therefore, it is reasonable that any changes made by the department would not be reflected in their data until late 2018 or early 2019. Since the three-year aggregate analysis covers a significant portion of time prior to our intervention, it is unsurprising that the department would continue to show statistically significant racial and ethnic disparities. We will continue monitoring the departments data to determine if improvements are made.

Although this year we formally identified **Troop D** (2020 sample and 2018-20 sample), **Troop L** (2018-20 sample) and **Headquarters** (2020 sample) with statistically significant racial and ethnic disparities, a comprehensive five-year analysis of traffic stop disparities for the entire State Police was published in May 2020 as part of the 2018 Traffic Stop Data Analysis and Findings report. There are very different challenges associated with assessing the racial and ethnic disparities identified for the State Police compared to municipal police departments. We will continue to monitor State Police aggregate and Troop level trends for significant variations and to determine if additional comprehensive analysis is warranted.

PART II: 2020 FOLLOW-UP ANALYSIS

IX: FOLLOW-UP ANALYSIS INTRODUCTION

The information presented in the subsequent section consists of a follow-up report conducted for the Middletown police department, which warranted further analysis. Although Troop D, Troop L, and the Headquarters Troop were identified with statistically significant racial and ethnic disparities, a comprehensive five-year analysis of traffic stop disparities for the entire State Police was published in May 2020 as part of the 2018 Traffic Stop Data Analysis and Findings report. There are very different challenges associated with assessing the racial and ethnic disparities identified for the State Police compared to municipal police departments. We will continue to monitor State Police aggregate and Troop level trends for significant variations and to determine if additional comprehensive analysis is warranted.

The goal of an enhanced analysis is to better understand the reasons for racial and ethnic disparities in traffic stop data. Disparities can be the result of the interplay of a variety of factors that can be identified and further explored through a more in-depth examination of the data. Although there are some factors common to policing in general, the true nature of policing can differ from one community to another based on a variety of unique factors. Police administrators must deal with a variety of crime and disorder problems. Traffic stop disparities can be influenced by factors such as the location and frequency of traffic crashes, high call for service volume areas, high crime rate areas, and areas with major traffic generators such as shopping and entertainment districts, to name a few. Police administrators frequently make decisions about how to effectively deploy police resources based on their perception of the needs of the community.

In order to understand the factors that might be contributing to traffic enforcement decisions, we first sought an understanding of where traffic enforcement occurs in the community. The best way to complete this task is to map traffic stops for each identified community. Police officers are required to report the location of a traffic stop in a manner that would allow the stop to be identified on a map. In some cases, technology allows the officer to capture the specific longitude and latitude coordinates for the stop. In other cases, the officer enters a descriptive location such as the number and street or street and nearest cross street.

The project staff worked with the municipal police department identified to map traffic stops during the study period. Unfortunately, specific longitude and latitude information wasn't available for the Middletown Police Department. Researchers determined that due to the lack of latitude and longitude coordinates in Middletown, researchers would conduct a descriptive analysis of traffic stops by major traffic corridors. The location information typically identified the road where the traffic stop was conducted, but not the specific point on the road. Although analyzing traffic stops by census tract is the preferred method, analyzing traffic stops by corridor can also be an effective approach. Presented in the subsequent section is our findings from the department level descriptive analysis for the Middletown police department.

X: MIDDLETOWN FOLLOW-UP ANALYSIS SUMMARY

Racial and ethnic disparities in any traffic stop analysis do not, by themselves, provide conclusive evidence of racial profiling. Statistical disparities do, however, provide significant evidence of the presence of idiosyncratic data trends that warrant further analysis. Based on the pre-established criteria for identifying racial and ethnic disparities in traffic stops, Part I of this report recommended that the Racial Profiling Prohibition Project staff conduct an in-depth analysis for the Middletown Police Department.

According to the results from the "Veil of Darkness" analysis, the Middletown Police Department indicated a statistically significant disparity in the rates that Hispanic motorists were stopped during daylight relative to darkness in the three-year aggregate sample. The veil of darkness analysis exploits quasi-random variation in visibility to identify potential discrimination controlling for day of week and time of day. During the sample window for this test, the odds a stopped motorist was Hispanic totaled 0.163 in darkness when we presume that police are less able to detect the race of a motorist prior to making a traffic stop. Conditioning on day of the week and time of day, the odds a stopped motorist was Hispanic grew to 0.246 during daylight when we presume that police are better able to detect race. These results were statistically significant at a level greater than 95 percent and robust to the inclusion of a variety of controls, officer-fixed effects, and a restricted sample of moving violations. Although certain assumptions have been made in the design of each methodology, it is reasonable to conclude that departments with consistent data disparities separating them from the majority of other departments should be subject to further review and analysis with respect to the factors that may have caused these differences.

During the three-year period, the Middletown Police Department made 6,977 traffic stops. Of these, 36.0% were minority stops (10% Hispanic and 24% Black). Table 10.1 below compares summary racial data for reported traffic stops in Middletown over a three-year period.

Table 10. 1: Middletown Traffic Stops – 2018 - 2020

	2018 Stops		2019 Stops		2020 Stops	
White	2,023	63.7%	1,865	64.6%	586	64.0%
Black	779	24.5%	679	23.5%	226	24.7%
AsPac*	41	1.3%	45	1.6%	10	1.1%
AI/AN**	13	0.4%	4	0.1%	4	0.4%
Hispanic	318	10.0%	294	10.2%	90	9.8%
Total	**3,174**		**2,887**		**916**	

*Asian Pacific
** American Indian/Alaska Native

X.A: Descriptive Analysis of the 2018-20 Traffic Stop Data

Researchers studied the racial and ethnic disparities in the Middletown Police Department data using a more detailed review of traffic stops during the study period. Part of this analysis involved mapping all stops, if possible, using the location data provided by the department and any enhancements we were able to make. Unfortunately, the descriptive information on stop locations was not specific enough to allow accurate mapping of the traffic stops reported. Due to the lack of detailed location information available in Middletown, a census tract-based analysis was replaced by a descriptive

analysis of major corridors and roadways. The location information typically identified the road where the traffic stop was made, but not the specific point on the road. Although analyzing traffic stops by census tract is the preferred method, analyzing traffic stops by corridor proved just as effective an approach because 79% of traffic stops in Middletown were made on 28 roadways. More specifically, stops on one roadway (Washington Street), account for 25% of all stops.

According to the 2020 American Community Survey from the United States Census, Middletown is a city with approximately 46,406 residents. Approximately 33% of the population in Middletown is identified as a racial or ethnic minority. Table 10.2 outlines the basic demographic information for Middletown residents according to the 2020 American Community Survey from the decennial census.

Table 10. 2: Middletown Population

Race/Ethnicity	Population Total	% Population Total
White Non-Hispanic	30,977	66.7%
Black Non-Hispanic	6,404	13.8%
AsPac Non-Hispanic	2,748	5.9%
Hispanic	4,761	15.4%
Other	1,516	3.3%
Total	**46,406**	

Middletown is approximately 42 square miles in area, located in the south-central part of the state. The Connecticut River runs alongside a significant portion of the eastern border of the city. The city is bordered by eight neighboring communities. Berlin and Cromwell are located along the northern border, Portland and East Hampton are located on the eastern border, Durham, and Haddam on the southern border, and Middlefield and Meriden on the western border of the city. Portland and East Hampton do not share a land border with Middletown and are separated by the Connecticut River. All surrounding towns, except Meriden, are predominantly white demographically, with an average white driving age population of 95% (compared to Middletown's white driving age population of 67%). Meriden's 65% white driving age population is comparable to Middletown's. Of the drivers stopped in Middletown, 94% were residents of the city[12].

Middletown is known as a college town in the Hartford-Springfield Knowledge Corridor Metropolitan Region. It is the home of Wesleyan University and is considered the second-largest metropolitan area in New England. Furthermore, in addition to the Middletown Police Department (MPD), the State of Connecticut Superior Court, the State Police Headquarters, and the headquarters for the Department of Emergency Services and Public Protection are all located in Middletown. The MPD is located on Main Street in the center of the city and is comprised of approximately 114 sworn officers. Coincidentally, the Superior Court is located a block away from the MPD, heading towards Harbor Park and the Connecticut River. It could be considered a draw for traffic as it is one of fifteen Superior Courts in Connecticut. On another note, the State Police HQ resides towards the northeast corner of the town on Country Club Road off exit 20 on I-91 North and shares a building with the Department of Emergency Services and Public Protection.

Middletown is home to Wesleyan University, Middlesex Community College (MXCC) as well as a multitude of commercial establishments such as shopping centers. Wesleyan University is a private

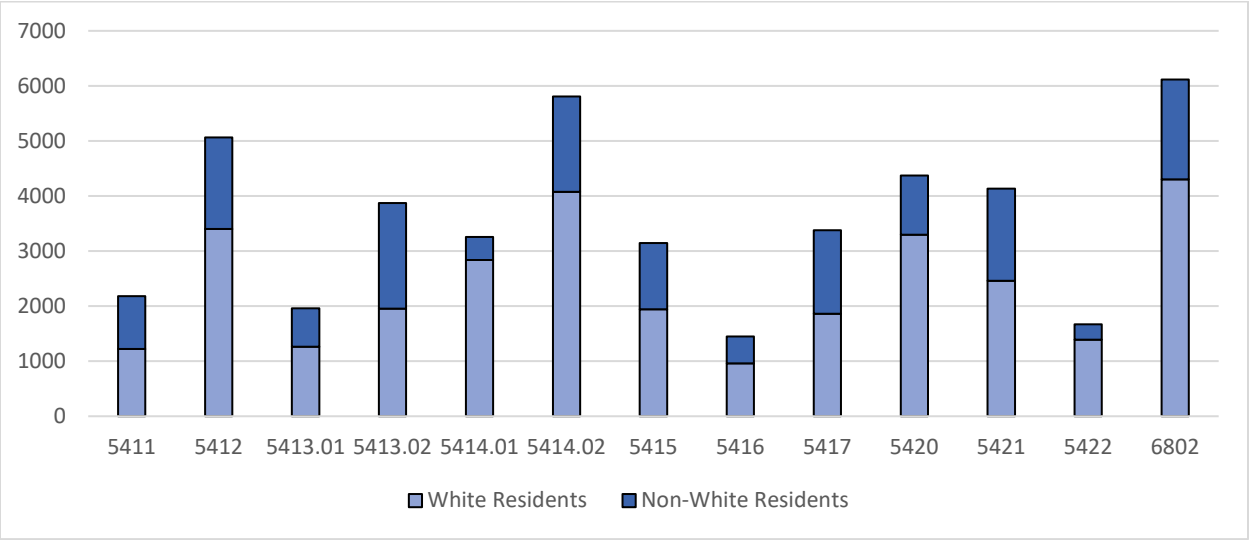
[12] It appears that residency information may have been misreported and is addressed later in this report.

college with an active liberal arts community and home to approximately 3,200 students pursuing degrees. It is in the center of Middletown, located off Washington Street, and could impact traffic during busy seasons such as the beginning and end of a semester. MXCC is the other college institution and serves about 4,000 students each year all of which are commuters and could impact traffic along Route 9 and surrounding local roads. Middletown's shopping centers are primarily located in the downtown area near the two academic institutions. Some of the largest shopping centers, Metro Square Shopping Center, Avon Shopping Plaza, Tradewinds Shopping Center, and Main Street Market are located along Route 9 and are possibly a large source of traffic for the community. The downtown combination of academic institutions and commercial areas potentially impacts traffic enforcement in those high traffic volume corridors.

Route 9 is one of the city's two major expressways, running north to south from Cromwell to Haddam and along the outskirts of the city center. Route 9 is a 41-mile freeway that begins in Old Saybrook and ends near I-84 in the Farmington-West Hartford area. It is a roadway that connects the eastern coastline and Connecticut River Valley to the Hartford region. Route 9 runs through Middletown for approximately 4 miles which includes a non-freeway portion of the highway. The non-freeway section of Route 9 is less than one-half a mile through downtown Middletown, where it overlaps with Route 17. Additionally, the non-freeway portion includes two traffic lights and allows local access to and from Miller Street. Interstate 91 is the other major expressway that runs through the city between Meriden and Berlin for approximately 2-miles. There is one on-ramp and off-ramp (exit 20) that is located near Country Club Road.

Although we do not conduct an analysis by census tract, it is still helpful to understand the racial make-up of different sections of the city, as evidenced in the census tract data. The U.S. Census Bureau divides Middletown into 11 census tracts. The resident population in each census tract varies with about 1,449 people living in tract 5416 (one of three downtown census tracts) and 6,617 people living in tract 6802, which is the southernmost tract in Middletown with its eastern border as the Connecticut River. The average share of racial and ethnic minority residents in each census tract is 33%. Six of the 11 census tracts have a larger share of racial and ethnic minority residents. The most diverse census tracts are 5413.02 (50% non-white residents), 5417 (45% non-white residents), 5411 (44% non-white residents), and 5421 (40% non-white residents). Figure 10.1 shows the distribution for each census tract in terms of the white and non-white populations.

Figure 10. 1: Resident Population by Census Tract



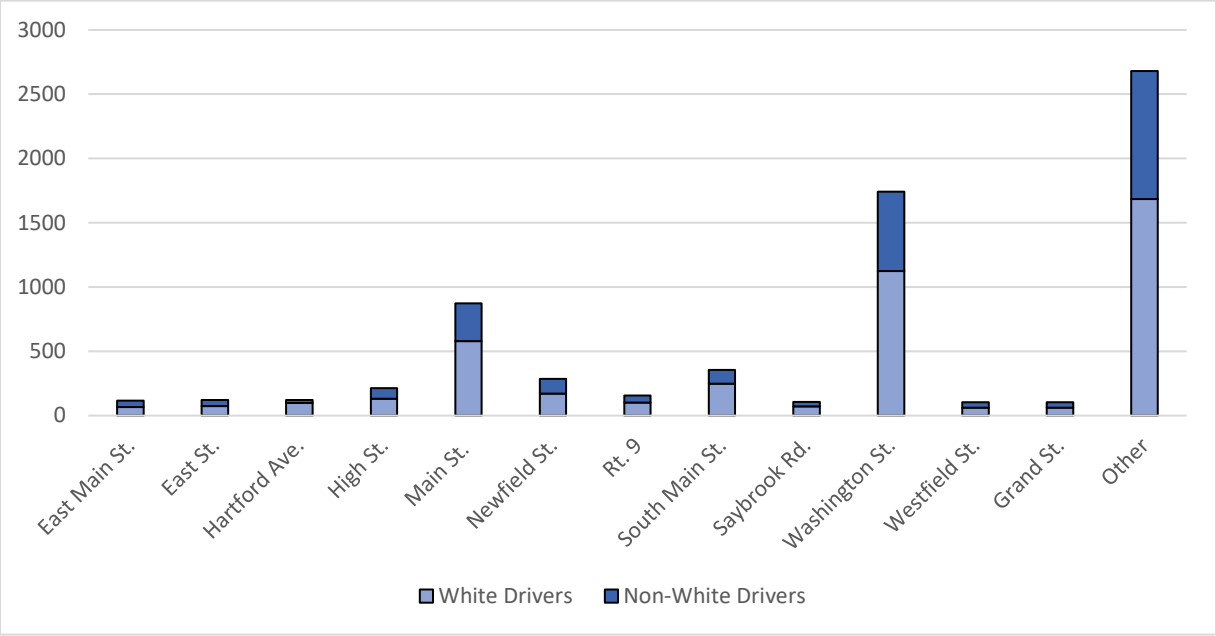
The Middletown Police Department identified its patrol division as the entity responsible for the majority of the traffic enforcement in the city. The patrol division is structured with six districts that operate three shifts per day (days, evening, and mid-shift). A minimum of at least one patrol officer patrols each district. During the day shift (7:45 a.m. to 4:15 p.m.) District 1 and District 6 have one patrol car and one beat officer, Districts 2, 3, and 4 all have one patrol car, and District 5 has two patrol cars. During the mid-shift (3:45 p.m. to 12:15 a.m.) the department adds two patrol cars that travel across districts. Finally, during the evening shift (11:45 p.m. to 8:15 a.m.) each district drops to one patrol car and the city has an additional patrol car roving the city. The patrol division is responsible for responding to calls for service, apprehending criminals, enforcing motor vehicle laws, and working with the public to prevent crime. In addition to the patrol division, Middletown also has a Street Crime Unit, typically consisting of three detectives that work during the mid-shift.

The six patrol districts in Middletown vary in size, likely based on the department's historical understanding of community needs. Districts 1 and 6 are the smallest in size but largely cover the downtown area. Washington Street from Newfield Street to Route 9 acts as a border between the two patrol districts. District 1 is to the north of Washington Street and District 6 is to the south of Washington Street. These two patrol districts generally overlap with three census tracts (5411, 5415, and 5416). The other four patrol districts cover significantly more geographic areas of the city. District 5 is located in the northwest portion of the city from the Meriden border to Ridgewood Road. District 5 generally overlaps with three census tracts (5413.01, 5413.02, and 5414.01). District 3 is to the east of District 5. Its borders include Ridgewood Road to the west, Newfield Street to the east, the border of Cromwell to the north, and Middlefield Street to the south. District 3 generally overlaps with two census tracts (5412, and 5414.02). Lastly, Districts 2 and 4 patrol the southern portion of the city. Ridge Road acts at the border between the two districts. District 4 is the largest land area to patrol. These two patrol districts include five of the most populous census tracts in the city including 5417, 5420, 5421, 5422, and 6802. Unfortunately, the location data was not detailed enough for researchers to determine where a traffic stop was made in terms of a patrol district. Although some roadways are solely within a particular patrol district, most major roadways cross into multiple districts. The district map does give us an indication that more police resources are placed in the downtown area, with fewer city residents, but likely a significant non-resident driving population.

X.B: Traffic Stop Breakdown by Roadway and Race/Ethnicity

Researchers identified 12 roadways in Middletown that account for 62% of traffic stop locations. More than 100 stops were conducted on each of these 12 roadways; all other roads in the city contributed fewer than 100 traffic stops each. In particular, Washington Street and Main Street account for 37% of all traffic enforcement in the city. There are also 13 small roadways within the downtown area where significant enforcement occurred. Only three of the 13 downtown roadways had more than 100 stops conducted on them individually (Hartford Ave., High Street, and Grand Street). However, combined these roadways account for 15% of all traffic stops in Middletown. This analysis of traffic stops in Middletown will largely focus more on these roadways rather than on census tracts, although some references to the census tract data are included. Figure 10.2 illustrates the volume of traffic stops that occur on each of the 12 identified roadways with more than 100 traffic stops.

Figure 10. 2: Traffic Stops by Major Roadway



In Middletown, 36% of all drivers stopped were racial and ethnic minority drivers, classified as all non-White drivers, but predominantly Black or Hispanic drivers. Middletown's resident population is 33% racial and ethnic minority. On its face, this might suggest a small disparity in the proportion of racial and ethnic minority drivers stopped during the study period. However, we are unable to identify the drivers stopped by Middletown police that are residents of the city. Unfortunately, the data provided by the department is unreliable when it comes to identifying residents. According to the data submitted by Middletown, 94% of drivers stopped were residents of Middletown. However, 47% of those drivers were identified as living outside of Connecticut. This is a clear indication that there was an issue in properly reporting the residency status of drivers stopped in the city.

Figure 10.3 shows the percentage of Black drivers stopped on each of the major roadways in Middletown compared to the average percentage of Black drivers stopped in the city. The percentage of Black drivers stopped exceeded the city average of 24% on six of the nine major roadways in the city and the Downtown area. The roadways that exceeded the city average of Black drivers stopped

accounted for 27% of all traffic stops and 30% of all stops of Black drivers. The two major roadways in the city with the most enforcement (Washington St. and Main St.) actually stop a lower percentage of Black drivers than the city average.

Figure 10. 3: Black Drivers Stopped Compared to the City Average

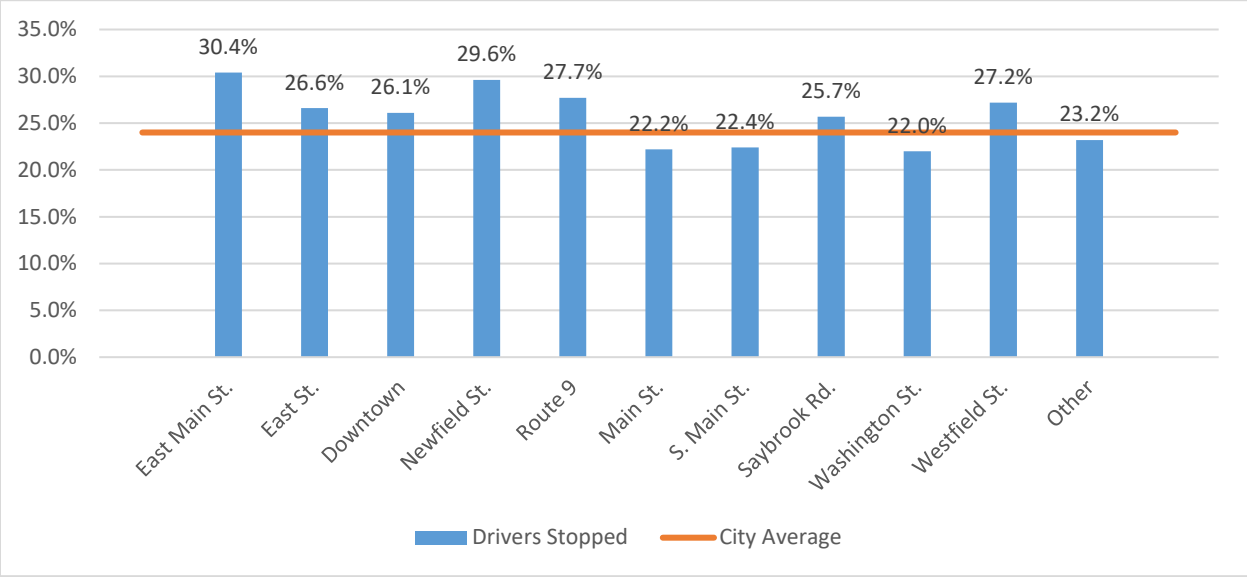
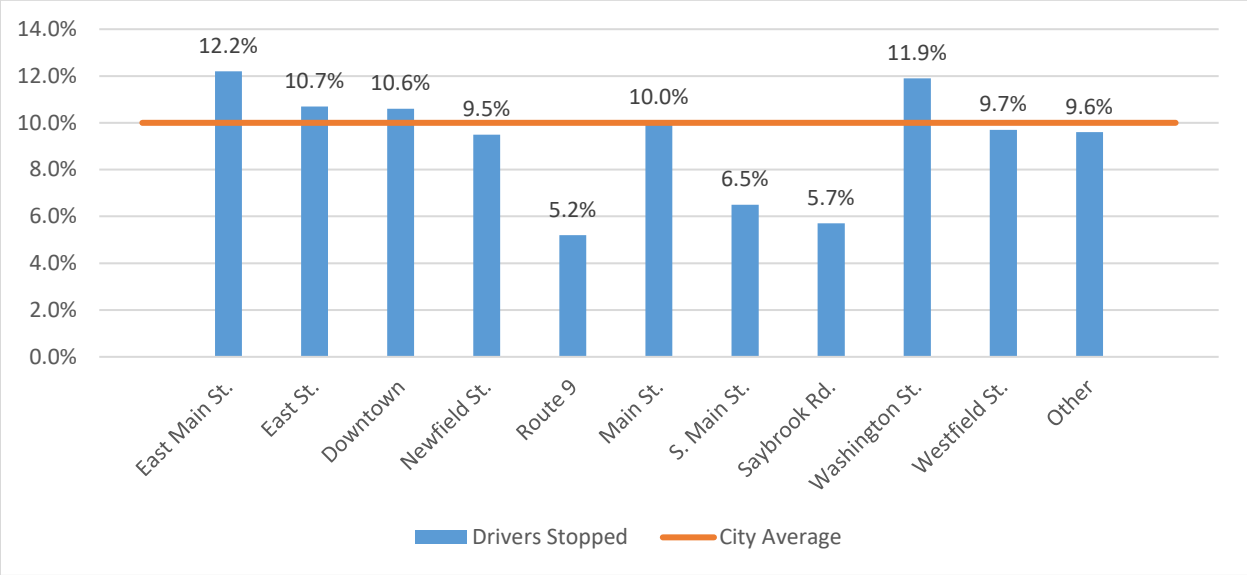


Figure 10.4 shows the percentage of Hispanic drivers stopped on each of the major roadways in Middletown compared to the average percentage of Hispanic drivers stopped in the city. The percentage of Hispanic drivers stopped exceeded the city average of 10% on three of the nine major roadways in the city and the Downtown area. The roadways that exceeded the city average of Hispanic drivers stopped accounted for 43% of all traffic stops and 48% of all stops of Hispanic drivers. One of the two major roadways in the city with the most enforcement (Main St.) actually stopped a lower percentage of Hispanic drivers than the city average.

Figure 10. 4: Hispanic Drivers Stopped Compared to the City Average



X.C: Traffic Stop Breakdown on Route 66 and Washington Street

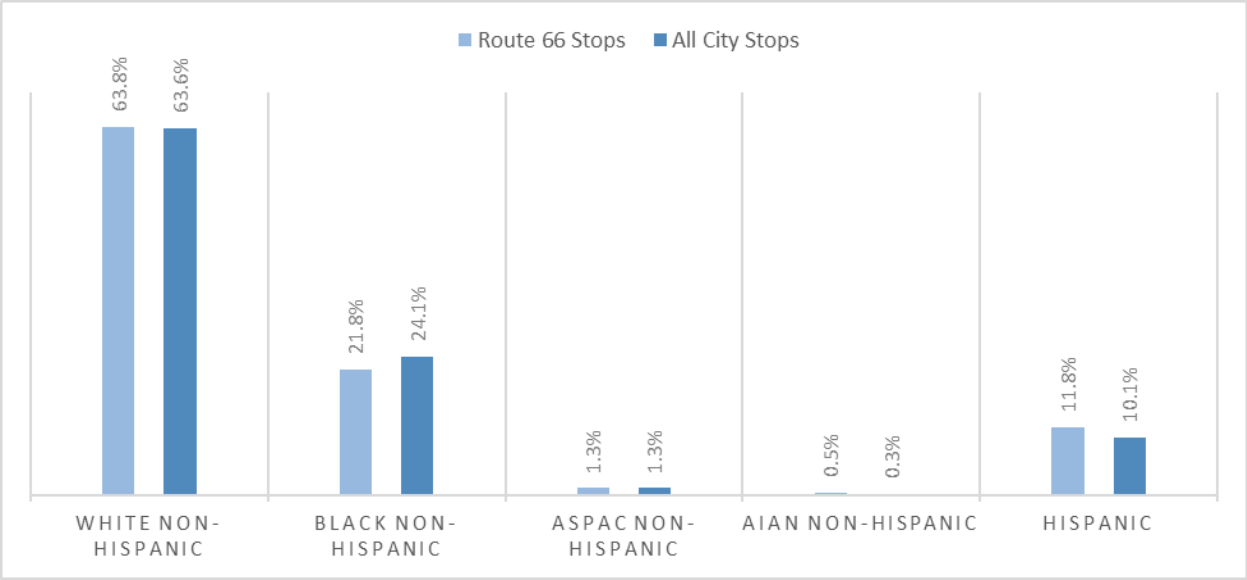
The greatest percentage of stops on any roadway in Middletown, 25 percent, occurred on Washington Street. Washington Street is the local name for Route 66 which is a primary state highway, approximately 38 miles long, that extends from Meriden to Windham. 3.6 miles of Route 66 run through the center of Middletown and is a busy commercial corridor. From the West, Washington Street enters Middletown at the border of Middlefield, and from the East, it crosses the Connecticut River. Washington Street continues into Portland on the other side of the river. It is mostly a four-lane road within Middletown that runs approximately west-southwest to east-northeast. In the eastern part of the city, the roadway crosses Main Street and runs through downtown Middletown. Moving West through downtown, Washington Street passes Wesleyan University's main campus before entering a commercial area with shopping centers including supermarkets, pharmacies, office supply stores, and other stores and restaurants. As you continue to travel west, Washington St. becomes more residential before you exit Middletown into Middlefield. Many residential streets are situated off Washington Street for its full length in Middletown.

Washington Street and Route 66 share the same local road name for 3 miles from the western border of Middlefield until the roadway crosses Main Street. For approximately 800 feet, Washington Street continues straight towards deKoven Drive, where it ends, but Route 66 continues north along Main Street and crosses into Portland across the Connecticut River at the Arrigoni Bridge. The overlap between Route 66 and Main Street is approximately 0.6 miles. Of the traffic stops reported along Route 66, 81% (1,417 stops) occurred on Washington Street. The remaining 19% (324 stops) were only reported on "Route 66, which could mean either Washington Street or the small section of Main Street.

To help understand traffic flow on Route 66, the analysis looked at the average daily traffic (ADT) records that are reported by the Connecticut Department of Transportation (DOT). DOT is responsible for collecting traffic volume information for state and local roads throughout the state by placing counting stations at different points along the roadway for a period to count the cars that drive through that point. According to the ADT information along Route 66, there are approximately 22,000 vehicles a day that crosses into Middletown from Middlefield. On the other hand, there are only about 10,000 vehicles a day that enter Washington Street from deKoven Drive. Traffic volume peaks at 33,000 vehicles a day where Route 66 intersects with West Street. This section of Route 66 is a high commercial activity area. The traffic volume remains between 25,000 and 33,000 vehicles per day almost until Washington Street crosses Main Street. Except for Route 9, this roadway is the busiest in the city. Based on the volume of traffic along Route 66, it is logical that there would be greater enforcement along the roadway, particularly in the central portions of Route 66 where there is more commercial activity.

A total of 1,741 traffic stops were made during the study years along Route 66. The overall percentage of traffic stops involving racial and ethnic minority drivers on Route 66 was 36%, which was equivalent to the city average. Approximately 12% of drivers stopped were Hispanic and 22% were Black. This is slightly lower than the city average of 10% Hispanic and 24% Black drivers stopped. Figure 10.5 shows the proportion of traffic stops on Route 66 by race and ethnicity compared to the city-wide average for all stops.

Figure 10. 5: Route 66 Traffic Stops by Race/Ethnicity



X.D: Traffic Stop Breakdown on Main Street and Saybrook Road

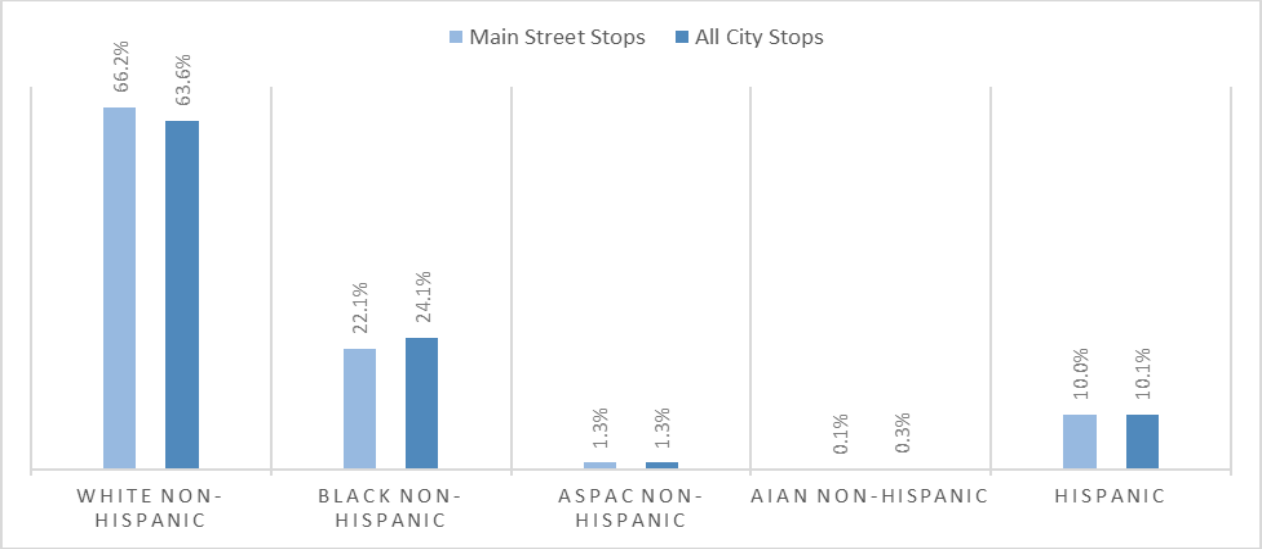
Main Street and Saybrook Road make up a nearly continuous road that runs approximately north-northwest to south-southeast in Middletown from the Connecticut River at the Arrigoni Bridge to the southern border with Haddam. Main Street runs for about a mile through downtown Middletown, in the North continuing across the river into Portland. It is commercial and has many stores and restaurants as well as churches, banks, and access via Court Street to the State of Connecticut Superior Court. Main Street then continues through downtown Middletown as Main Street Extension for about 0.7 miles before ending in a commercial area with larger stores, including grocery stores and pharmacies. After becoming East Main Street for about 200 feet, it turns into Saybrook Road, which runs about 4.4 miles to the Haddam border. South of the northernmost commercial area, Saybrook Road is mainly residential with areas of significant commercial activity, including a large number of medical offices. South of Middletown, Saybrook Road continues into Haddam.

According to the ADT information, traffic is greatest on Main Street as you cross into town from the Arrigoni Bridge with approximately 30,000 vehicles a day. Traffic volume decreases to 16,000 vehicles a day once you cross Grand Street and travel south along Main Street. Traffic volume remains consistent between 11,000 and 16,000 vehicles a day until Main Street changes to Saybrook Road. Along Saybrook Road, traffic volume is approximately 10,000 vehicles a day until the roadway crosses Route 9 where it decreased to 7,000 vehicles a day to the border of Haddam. The high traffic volume along most of the Main Street corridor would help to explain greater levels of enforcement in this area of the city.

A total of 873 traffic stops were made during the study year along Main Street (including the Main Street Extension). The overall percentage of traffic stops involving racial and ethnic minority drivers was 34%, about two percent lower than the city average. Approximately 10% of drivers stopped were Hispanic and 22% were Black. The percentage of Hispanic drivers is equivalent to the city average, but the percentage of Black drivers is slightly lower than the city average of 24%. Figure

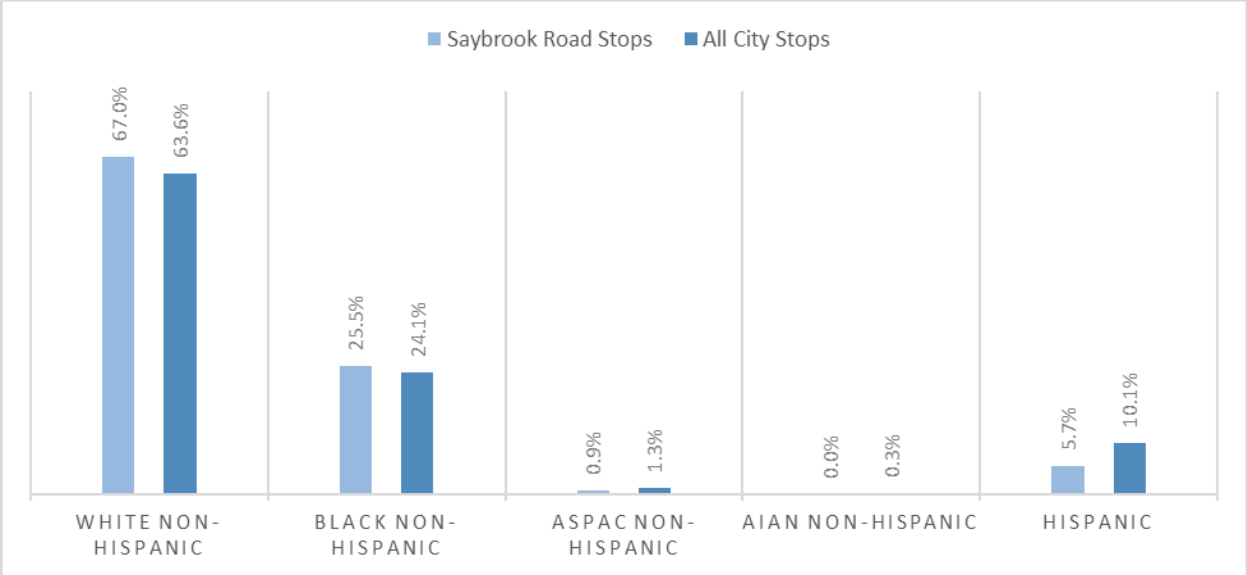
10.6 shows the proportion of traffic stops on Main Street by race and ethnicity compared to the city-wide average for all stops.

Figure 10. 6: Main Street Traffic Stops by Race/Ethnicity



A total of 106 traffic stops were made during the study year along Saybrook Road. The overall percentage of traffic stops involving racial and ethnic minority drivers was 33%, about three percent lower than the city average. Approximately 6% of drivers stopped were Hispanic and 25% were Black. The percentage of Hispanic drivers is over four percent less than the city average of 10%, while the percentage of Black drivers is only slightly higher than the city average of 24%. Figure 10.7 shows the proportion of traffic stops on Saybrook Road by race and ethnicity compared to the city-wide average for all stops.

Figure 10. 7: Saybrook Road Traffic Stops by Race/Ethnicity

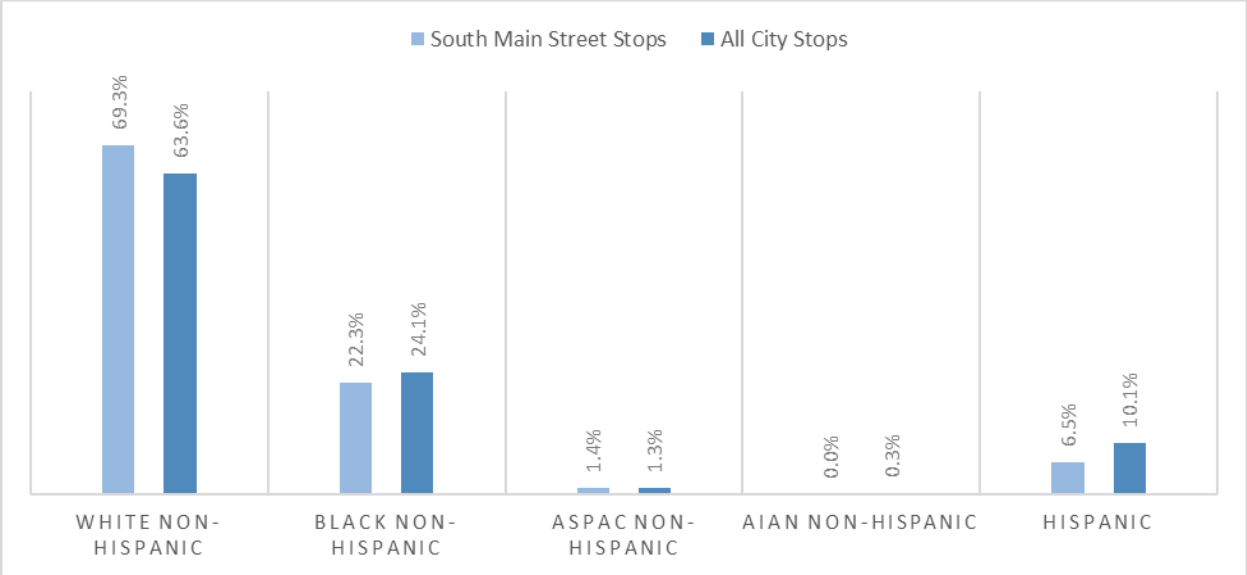


X.E: Traffic Stop Breakdown on South Main Street

South Main Street is a road that runs for about 4.5 miles in Middletown from its intersection with Pleasant Street and Church Street in downtown Middletown to the southwestern corner of the town, where it runs along the border of Middlefield and Durham before continuing in Durham. It runs approximately north-northeast to south-southwest for its entirety in Middletown, and coincides with Route 17, excepting the last .3 miles in downtown Middletown. In the North, it is commercial, including part of downtown Middletown, and in the South, it is largely residential. There are a large number of restaurants along South Main Street, along with a car dealership, banks, gas stations, a public library, and smaller stores. South Main Street is high traffic corridor with approximately 12,000 vehicles a day traveling along the southernmost section of the roadway and increasing in volume to approximately 17,000 vehicles a day as you approach the downtown area.

A total of 355 traffic stops were made during the study year along South Main Street. The overall percentage of traffic stops involving racial and ethnic minority drivers was 31%, over five percent lower than the city average. Approximately 6% of drivers stopped were Hispanic and 22% were Black. The percentage of Hispanic drivers is about four percent less than the city average of 10%, and the percentage of Black drivers is two percent lower than the city average of 24%. Figure 10.8 shows the proportion of traffic stops on South Main Street by race and ethnicity compared to the city-wide average for all stops.

Figure 10. 8: South Main Street Traffic Stops by Race/Ethnicity



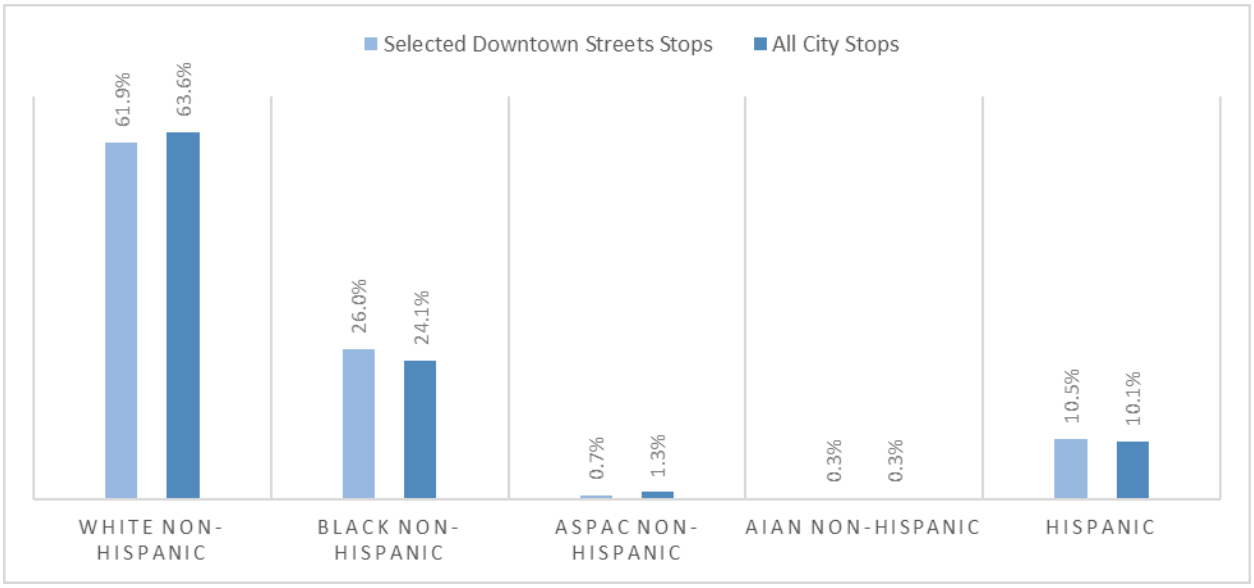
X.F: Traffic Stop Breakdown on Selected Downtown Streets

Downtown Middletown is composed of many streets, 13 of which account for just under 15% of all traffic stops in Middletown. These streets include Broad Street, Church Street, deKoven Street, Hartford Avenue, High Street, Liberty Street, Pearl Street, Spring Street, Grand Street, Court Street, Prospect Street, William Street, and College Street. High Street, notably, runs North-South through the entire downtown area, also bordering Wesleyan University. The State of Connecticut Superior Court is located on Court Street, to which deKoven Street provides access to. Court Street, College Street, William Street, and Church Street also border Wesleyan University at some points. Downtown

Middletown is highly commercial, and many roads have restaurants, stores, entertainment centers, and religious establishments. High Street had over 200 traffic stops during the study year, and both Hartford Avenue and Grand Street had over 100. Broad Street, deKoven Street, Liberty Street, Pearl Street, and Spring Street all had more than 50 but less than 100 traffic stops. The selected downtown streets are not individually particularly high-traffic areas, but combined reflect a generally busy downtown area. An average of 7,200 vehicles drive on the downtown stretch of High Street a day. Church Street has between 4,400 and 5,700 vehicles a day, depending on the section. deKoven Street has between 3,300 to 6,300 vehicles a day, with the busiest section being the two blocks on either side of Court Street, which provides access to the Superior Court.

A total of 1,017 traffic stops were made during the study year along the selected downtown streets. The overall percentage of traffic stops involving racial and ethnic minority drivers on these roads was 38%, about two percent higher than the city average. Approximately 11% of drivers stopped were Hispanic and 26% were Black. The percentage of Hispanic drivers is just over than the city average of 10%, and the percentage of Black drivers is about two percent higher than the city average of 24%. Figure 10.9 shows the proportion of traffic stops on the selected downtown streets by race and ethnicity compared to the city-wide average for all stops.

Figure 10. 9: Selected Downtown Streets Traffic Stops by Race/Ethnicity



X.G: Traffic Stop Distribution for Middletown Officers

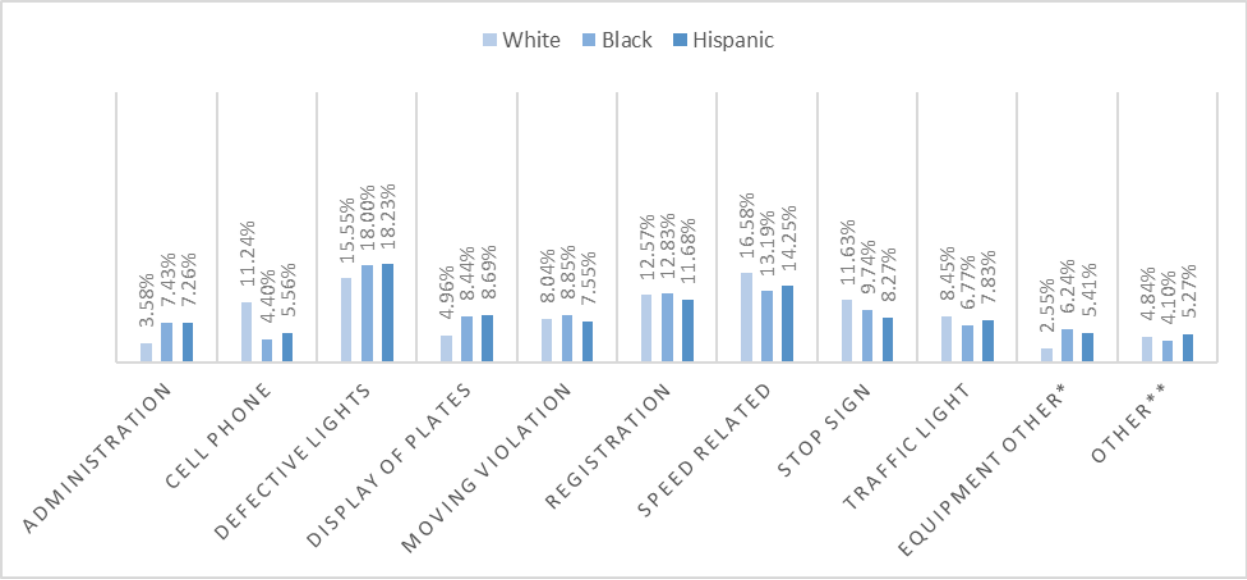
Middletown's total of 6,977 traffic stops between 2018 and 2020 was reported for 98 officers, an average of 71 stops per officer. Of the 98 officers reporting stops, 59 officers made fewer than 50 stops, 18 officers made between 50 and 100 stops, 11 officers made between 100 and 200 stops, and 10 officers made over 200 stops. The 10 most active officers making more than 200 stops collectively accounted for 48% of all Middletown stops. The most active officer made 542 stops or 8% of all traffic stops. While these 10 officers clearly had the greatest impact on Middletown's total stop numbers, the average number of stops per officer is still substantial and not greatly impacted by any one officer.

X.H: Post-Stop Outcome Review

Reason for Stops

The reasons police stop a motor vehicle can vary significantly from department to department. Researchers reviewed the statutory authority that Middletown officers reported as the reason for stopping motor vehicles. The three most common reasons cited for stopping a motorist in Middletown cover about 45% of the total stops. The three largest stop categories were defective lights (16%), speeding (16%), and registration violations (12%). Figure 10.10 illustrates the reason officers used to stop a motor vehicle by race and ethnicity.

Figure 10. 10: Reason for Traffic Stop



*Equipment Other includes violations for defective lights, excessive window tint, or display of plate violations.

Reasons for traffic stops in Middletown vary by race and ethnicity. White drivers are more than twice as likely to be stopped for a cell phone violation compared to Black and Hispanic drivers and are somewhat more likely to be stopped for speeding, stop signs, and traffic light violations. On the other hand, Black and Hispanic drivers are more than twice as likely to be stopped for administrative violations, display of plate violations, and other equipment violations. Black and Hispanic drivers are also somewhat more likely to be stopped for defective lighting violations. Middletown conducts significantly more stops for defective lights, display of plates, and general equipment violations compared to the state average.

While White drivers were stopped more frequently than Black or Hispanic drivers for more hazardous driving violations as a percentage of their total stops, Black and Hispanic drivers were stopped more frequently for equipment-related violations and administrative offenses than White drivers as a percentage of their total stops. The data shows that, with respect to the racial and ethnic demographics of those stopped, equipment-related violations (defective, improper, or inoperative lighting; display of plates; or window tinting) and administrative offenses are closely related to the frequency and location of where the stops are made. When these types of stops are made more frequently in locations where there are higher concentrations of minority drivers, they tend to result in higher proportions of minority drivers being stopped than White drivers. However, in many places,

the data also shows that when these same types of stops are made in areas with a higher concentration of White drivers, the stop demographics shift toward White drivers, suggesting that the likelihood of finding violators may be more dependent on location than race.

Evaluating the differences in stop reasons by location was difficult in Middletown given the lack of specific location data. The roads evaluated have relatively small differences in traffic stops by race or ethnicity because of how general the classifications are. For example, Saybrook Road had 3% fewer racial and ethnic minority drivers among those stopped compared to the average of all stops for Middletown. While stop sign and cell phone violations are less common on Saybrook Road, significantly more speed enforcement is done (36% of stops). Saybrook Road primarily runs through two of the most populous census tracts in the city (5420 and 6802). These census tracts have a higher percentage of White non-Hispanic residents than the city average (73% compared to 66%). This could help to explain why White non-Hispanic drivers are more likely to be stopped along Saybrook Road than in other areas of the city. On the other hand, a driver is more likely to be stopped for a defective light violation on South Main Street. Approximately 23% of stops on South Main Street are for a defective light violation compared to the city average of 16%. In general, we found that Black and Hispanic drivers are also stopped at a higher rate on South Main Street.

We did notice that the type of traffic stops seems to vary by location in Middletown. In the group of downtown streets, 17% of traffic stops are for stop sign violations, which is 7% more than the city average. Only 3% of stops are speed-related violations, which is 12% lower than the city average. This is unsurprising given that the streets in the downtown area have more local roads with stop signs and may be less conducive to speeding. In the same downtown area stops for registration violations are 4% higher than the city average and defective lighting stops are 3% below the city average. On the other hand, on Saybrook Road, 36% of traffic stops are speed related, 20% higher than the city average. Stop sign and registration violations are 6% lower than the city average on Saybrook Road. On Hartford Avenue, police appear to largely focus on cell phone violations because 68% of the stops are for this reason, which is 58% greater than the city average.

Another observation is that speed-related motor vehicle enforcement appears to have been lower in Middletown compared to most other municipal police departments. Approximately 16% of all stops in Middletown were for speed-related reasons compared to 28% statewide. Interestingly, there were more stops for defective lights than speeding in the city, which is uncommon amongst most municipal police departments.

In Middletown, officers only reported 5% of speed-related stops as "blind." This means an officer reported using a blind enforcement technique like radar, laser, license plate recognition device, or other similar technology or method. The speed-related stops recorded as "blind" were likely the result of an officer using radar or laser technology. It is likely that significantly more speed-related stops were conducted with radar or laser technology but were coded improperly. Stops made for reasons like seat belt violations, moving violations, and cell phone use, show that the department is incorrectly reporting the use of blind stops. This makes it impossible to use blind-stop demographics to demonstrate a lack of racial profiling.

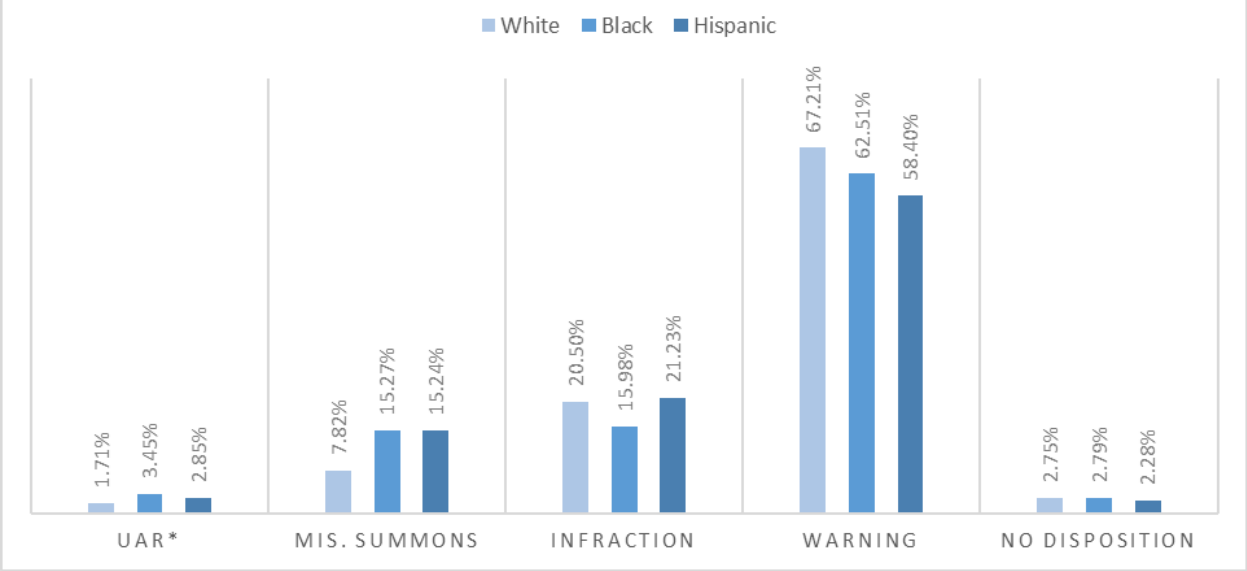
The largest number of speed-related stops occurred on Washington Street with 263 speed-related stops (24% of all speed stops). This is unsurprising given that it is also the highest-enforcement roadway. Over 65% of the White drivers stopped for speeding were stopped on one of the three high-enforcement roadways compared to 70% of Black drivers and 70% of Hispanic drivers. The racial

demographics for all speed-related stops were 68% White, 20% Black, and 9% Hispanic. If you assume that most speed-related stops were "blind", the racial demographics of drivers stopped for speed-related offenses could reflect the general violator population in the city. Based on this assumption, there would be a disparity for Hispanic drivers, who represented only 9% of speed-related stops, but 15% of all stops.

Outcome of Stops

The majority of motor vehicle stops in Middletown (65.5%) resulted in the driver receiving a warning. Black and Hispanic drivers were more likely to receive a misdemeanor summons as a percentage of their total stops. Black drivers were less likely to be charged with an infraction compared to White and Hispanic drivers. White drivers were more likely to receive a warning as a result of the stop. Figure 10.11 shows the outcome of motor vehicle stops by race and ethnicity.

Figure 10. 11: Outcome of Traffic Stop



Most violations of motor vehicle laws are designated as infractions, but some are not. The more serious violations can be reckless driving, operating under suspension, operating under the influence of alcohol or drugs, and operating an uninsured or underinsured vehicle. The system for collecting and reporting traffic stop data requires officers to record the statutory citation for the violation that was the basis for the stop as well as any subsequent charges that differed from and were more significant than the initial charge. This provides the data on the initial cause for making a stop as well as any subsequent, more serious charge. For example, if someone was initially stopped for a lesser reason such as not wearing a seat belt or rolling through a stop sign, the officer might subsequently determine that the driver was operating with a suspended license. If this information is properly recorded, researchers are able to distinguish those stops from the ones that begin and end with the same charge.

In Middletown, 714 of the stops made resulted in the issuance of a misdemeanor summons (10%), which is significantly more than the state average of 6%. Black and Hispanic drivers were almost twice as likely to be issued a misdemeanor summons following a stop than were White drivers (15%

of Black and Hispanic drivers stopped compared to 8% of all White drivers). Of the misdemeanor violation stops, 690 were initiated for a reason that was not a misdemeanor violation (e.g., speeding, stop sign violation, defective or improper lighting, etc.) However, once the officer interacted with the operator of the vehicle a misdemeanor violation should have been identified. The vast majority of these stops resulted in a misdemeanor summons for a license- or registration-related issue. Unlike many infraction violations, officers have limited discretion in the issuance of a misdemeanor summons when a misdemeanor violation is identified. Officers did not report the misdemeanor violation in most of the stops where the data indicated a misdemeanor violation occurred.

Search Information

A review of the Middletown department's search information shows that 10% (697) of the drivers stopped in Middletown were subjected to a motor vehicle search. This rate of motor vehicle searches is significantly above the state's 3% average. Moreover, Hispanic drivers were searched at almost twice the rate of White drivers, and Black drivers were searched at almost three times the rate of White drivers. Of the 697 vehicles searched, only 4% were subjected to an inventory search (compared to 21% statewide), 23% were subjected to a consent search (compared to 36% statewide), and 74% were subjected to a search for some other reason (compared to 43% statewide). In inventory searches, contraband was found 58% of the time (known as the "hit rate"). It is common for inventory searches to be conducted before towing a car, but only 65% of searches recorded as inventory searches involved a towed vehicle. In consent searches, the hit rate was 29%, and in searches conducted with some other authorization, the hit rate was 62%. The overall hit rate was above the state average across all racial and ethnic groups. However, Middletown is searching Black and Hispanic motorists at least two to three times more frequently to achieve the same success rate as White drivers. This would suggest a significant racial and ethnic disparity in vehicle searches. Figure 10.12 illustrates the motor vehicle search rate and the hit rate by race and Figure 10.13 illustrated the motor vehicle search rate, excluding inventory searches.

Figure 10. 12: Search and Hit Rate (All Searches)

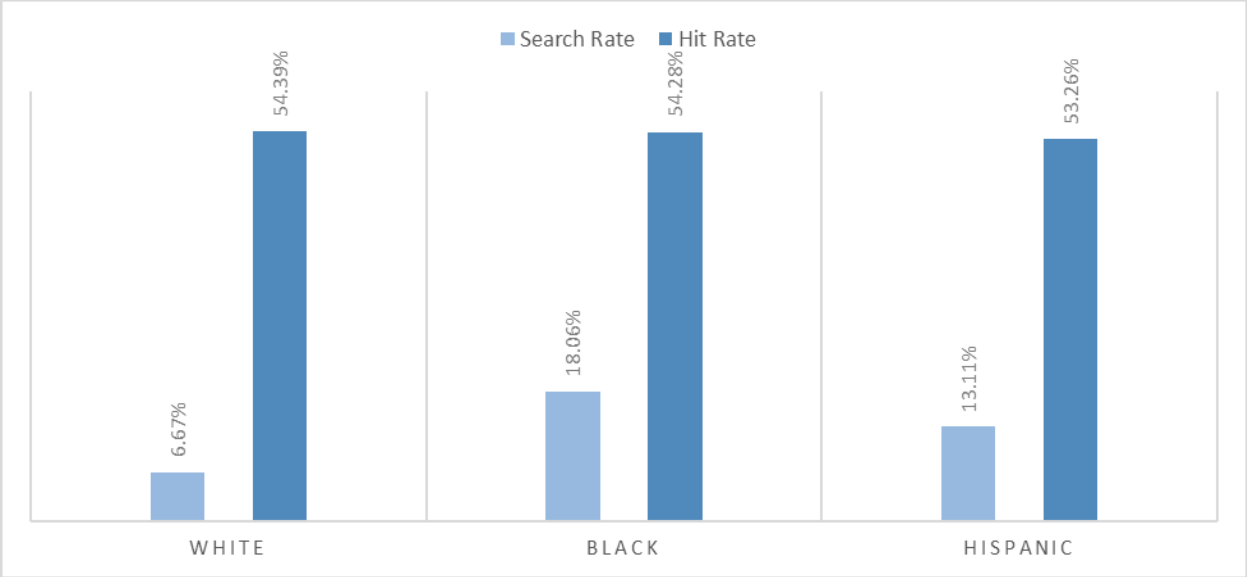
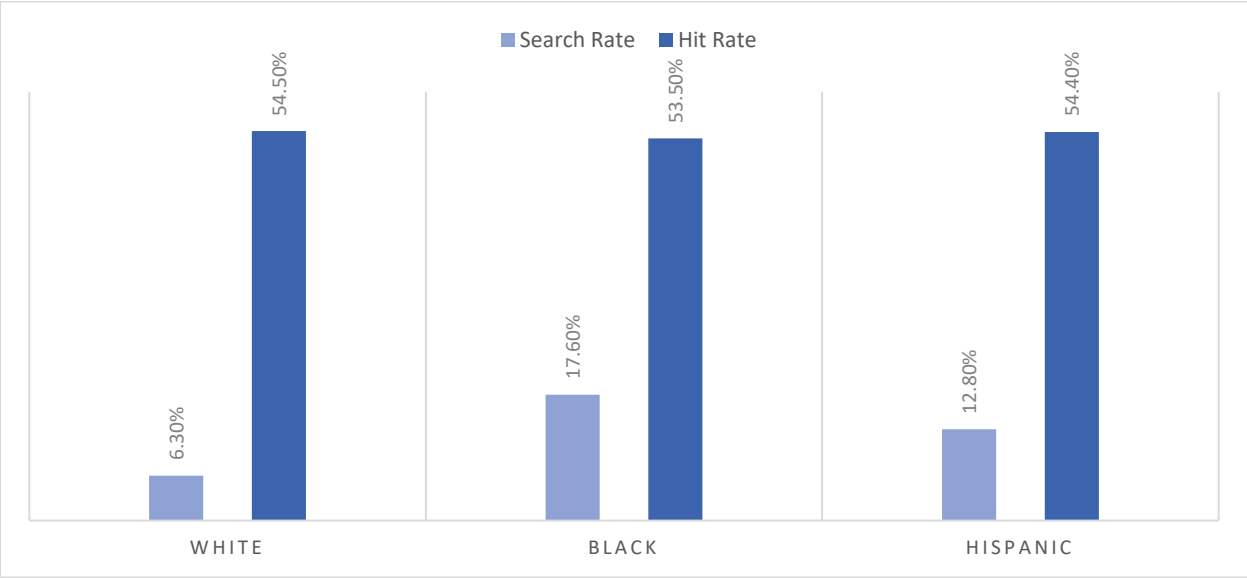


Figure 10. 13: Search and Hit Rate (Excluding inventory searches)



X.I: Additional Contributing Factors

Law enforcement administrators choose to deploy police resources within a community based on a number of different factors, including where calls for service are more prevalent. The department provided researchers with the calls for service log, which included calls for service and officer-initiated actions that were called into police dispatch. The logs report approximately 64,000 entries annually. The top reasons for calling dispatch were for a property check (23%), suspicious activity (8%), or a motor vehicle crash (6%). These top three reasons account for about 37% of all calls. In a review of calls for service by patrol districts, the two smallest patrol districts (District 1 and District 6) receive the largest volume of activity. District 1 accounts for 24% of all activity, and District 6 accounts for 22% of all activity. District 3, which is geographically larger, also accounts for a large share of the call activity with 19% of calls. Districts 2, 4, and 5, which cover the largest land area of Middletown, only account for 35% of the activity.

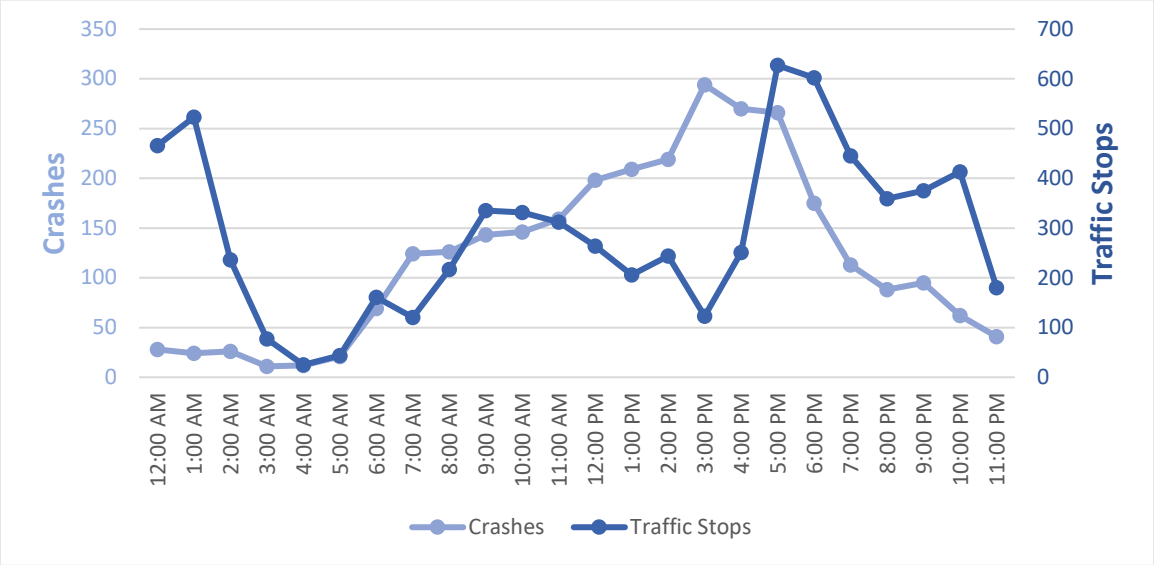
In addition to calls for service, law enforcement administrators also distribute police resources within a community based on traffic crash rates or where crime rates are higher. In addition to these factors, police presence may be greater where traffic volume is higher as the result of common factors that draw people into a community such as employment and entertainment. Traffic enforcement actions are likely to be more prevalent in locations that attract greater police presence due to any of these factors. Basic information on crime, traffic crashes, and other economic factors associated with Middletown are important considerations that provide a context to potentially explain the rationale for police deployments.

According to the Connecticut Economic Resource Center (CERC) town profiles, approximately 27,000 people work in Middletown and its major employers include Pratt and Whitney, Middlesex Health, Community Health Center, FedEx Ground, and Connecticut Valley Hospital. The vast majority of commuters traveling into Middletown for employment are from Meriden, New Britain, Cromwell, Portland, and Haddam. The overall unemployment rate is equivalent to the unemployment rate for the state.

During the study period, approximately 2,900 motor vehicle crashes occurred on roads patrolled by the Middletown Police Department. Approximately 1,125 crashes were reported in 2018, 974 crashes were reported in 2019, and 820 were reported in 2020. Unsurprisingly, traffic crashes decreased in 2020 due to the impact of the COVID-19 pandemic. Additionally, crashes were reported as occurring on more than 150 roads in the city. The roadways with the highest number of crashes were Washington Avenue (736 crashes), South Main Street (209 crashes), Route 9 (201 crashes), Newfield Street (175 crashes), and Main Street (116 crashes). There were 43 roads with 10 or more crashes and those roads account for 79% of all crashes in Middletown. Washington Avenue accounted for 25% of all crashes in the town.

Figure 10.14 illustrates the time of day when traffic crashes were reported and the number of traffic stops that occurred during that same period. This shows how traffic enforcement is correlated with traffic crashes in Middletown. While the vehicle crash rate in town tends to build steadily throughout the day, it peaks during the afternoon period from 12:00 p.m. to 5:00 p.m. However, traffic enforcement peaks between midnight and 2:00 a.m. and between 4:00 p.m. and 6:00 p.m.

Figure 10. 14: Crashes Compared to Traffic Stops by Time of Day



X.J: Summary of Findings

The Middletown Police Department identified factors they believe contributed to some of the racial and ethnic disparity identified in the initial analysis of traffic stops. In particular, the department identified areas with the highest levels of traffic as some of the same areas with the highest levels of motor vehicle enforcement. They also indicated the impact that reported incidents of crime and crashes along Washington Avenue have had on the deployment of departmental resources. It is evident from the volume of traffic stops made along Washington Street that the department concentrates its resources primarily in and around this roadway and that Washington Street makes up the high enforcement area in the city.

There are 12 roadways where 100 or more traffic stops occurred and account for 62% of all stops. In particular, two roadways, Washington Street and Main Street are where significant traffic enforcement occurred. Almost 37% of all traffic stops in Middletown occurred on Washington Street and Main Street, with 22% of the stops involving Black drivers and 11% of the stops involving

Hispanic drivers. Washington Street is a primary state highway that extends from Meriden to Windham, with 3.6 miles running through the center of Middletown. It is mostly a four-lane roadway within Middletown and is a high commercial activity corridor. The roadway crosses Main Street, where downtown Middletown is also a high commercial activity corridor with many shops and restaurants. In addition to Washington Street and Main Street, other roadways also stood out with higher levels of traffic enforcement. These roads include Saybrook Road, South Main Street, and 13 small streets that comprise the majority of the downtown area. The 13 streets that make-up the downtown area account for 15% of all traffic stops in the city. It is clear from the analysis that traffic enforcement is heavily focused in and around the downtown area, including along Washington Street and Main Street.

Based on the average daily traffic counts provided by the Connecticut Department of Transportation, the level of stop activity along Washington Street and Main Street is logical given the significant traffic volume in this area. There are between 25,000 and 33,000 vehicles a day that travels along Washington Street and crosses over Main Street. Traffic volume is sustained at a high level in the central portion of Washington Street, which is a high commercial activity area. Except for Route 9, which is a state highway, Washington and Main streets are the busiest roads traveled in the city.

In this report, we were unable to make an assessment of the impact that out-of-town drivers may have had on the racial and ethnic disparity in traffic stops. Unfortunately, the data provided by the department was unreliable when it came to identifying the residency status of drivers stopped. According to data submitted by the department, 94% of drivers stopped were residents of Middletown, but 47% of those drivers were also identified as living outside of Connecticut. This is clearly a data collection or reporting error that limits the scope of our analysis.

Middletown has 98 officers who made at least one traffic stop during the study period. The average number of stops made per officer was 71, but 10 officers (10% of the officer force) who made over 200 stops each accounted for 48% of all the traffic stops. The most active officer accounted for 8% of all traffic stops reported during the study period. When a relatively small portion of the officer force makes a significant portion of all the stops, the specific duties, patrol areas, and shifts of these officers might have a significant impact on overall stop demographics.

Traffic Stop Outcomes

In Middletown, the three most common reasons used for stopping a motorist make up 45% of the total stops. The three largest stop categories were for defective lights (16%), speeding (16%), and registration violations (12%). While White drivers were stopped more frequently than Black or Hispanic drivers for more hazardous driving violations, Black and Hispanic drivers were stopped at a higher rate for equipment-related and administrative offenses. Middletown conducts significantly more stops for defective lights, display of plates, and general equipment violations compared to the state average.

The type of traffic stops did vary by location in Middletown. For example, in the group of downtown streets, more stop sign enforcement was conducted and less speed enforcement than the city average. This is unsurprising given that the streets in the downtown area have more local roads with stop signs and may be less conducive to speeding. In the same downtown area stops for registration violations were higher than the city average and defective lighting stops are below the city average. On the other hand, speed enforcement was significantly greater along Saybrook Road. On Hartford Avenue, police largely focused on cell phone violations.

Another observation we make is that speed-related motor vehicle enforcement was lower in Middletown compared to most other municipal police departments. Approximately 16% of all stops in Middletown were for speed-related reasons compared to 28% statewide. Interestingly, there were more stops for defective lights than speeding in the city, which is uncommon amongst most municipal police departments.

We also identified another data collection or reporting error in the Middletown data, which again limited our ability to fully assess the information. Only 5% of speed-related stops were reported as "blind." This means an officer reported using a blind enforcement technique like radar, laser, license plate recognition device, or other similar technology or method. The speed-related stops recorded as "blind" were likely the result of an officer using radar or laser technology. It is likely that significantly more speed-related stops were conducted with radar or laser technology but were coded improperly. Stops made for reasons like seat belt violations, moving violations, and cell phone use, show that the department is incorrectly reporting the use of blind stops. This makes it impossible to use blind-stop demographics to demonstrate a lack of racial profiling.

That being said, speed enforcement was greatest along Washington Street. This is unsurprising given that it is also the highest-enforcement roadway. The racial demographics for all speed-related stops were 68% White, 20% Black, and 9% Hispanic. If you assume that most speed-related stops were "blind", the racial demographics of drivers stopped for speed-related offenses could reflect the general violator population in the city. Based on this assumption, there would be a disparity for Hispanic drivers, who represented only 9% of speed-related stops, but 15% of all stops.

Regarding stop outcomes, Black and Hispanic drivers were more likely to receive a misdemeanor summons. Stops involving Black drivers were less likely to result in an infraction citation than either White or Hispanic drivers. The majority of motor vehicle stops in Middletown resulted in the driver receiving a warning (65%). The proportion of Middletown's traffic stops that resulted in a misdemeanor summons (10%) was greater than the state average of 6%. The majority of the stops that resulted in a misdemeanor charge were initiated for a reason that was not initially a misdemeanor violation. However, once the officer interacted with the operator a misdemeanor violation was identified. Most of the misdemeanor charges were for a license or registration-related issue. Unlike many infraction violations, officers do not have discretion in the issuance of a misdemeanor summons when such a violation is identified. Unfortunately, the officer did not report the misdemeanor violation in most of the stops where a misdemeanor was cited as the stop disposition.

Middletown police searched 10% of drivers they stopped, which was above the state average of 3%. Black drivers were searched at almost three times the rate of White drivers and Hispanic drivers were searched at almost twice the rate of white drivers. Although the hit rate or rate at which police find contraband may appear similar across racial and ethnic groups, Middletown has to search significantly more Black and Hispanic motorists to achieve the same success rate as White drivers. This would suggest a significant racial and ethnic disparity in vehicle searches.

Conclusion

Taken as a whole, the Middletown traffic stop data reflects the influence of the Washington and Main Street corridors and the downtown area where drivers are somewhat more diverse than in the other areas of the city. These areas are a significant traffic magnet for business, shopping, and entertainment and are a major access point to Route 9. Based on the volume of traffic along

Washington and Main Street, it is logical that there would be greater enforcement within this area. The department would benefit by reviewing its enforcement practices along Washington Street and Main Street to assure that enforcement doesn't have a disparate impact on Black and Hispanic drivers. When disparities result from policies and practices established to meet community and policing goals and objectives, even when profiling is not a direct result, communities can feel disadvantaged unless they can clearly perceive the overall benefits of the enhanced enforcement approach. It is important that the department assure that its community fully understands what benefits come from this enforcement presence in the high-traffic volume areas.

While White drivers are more likely to be stopped in Middletown than Black or Hispanic drivers for most types of hazardous driving behaviors, Black and Hispanic drivers are more likely to be stopped for vehicle equipment, registration, and administrative violations. Middletown should evaluate the frequency of stops for defective lights, display of plates, and other equipment violations. There is significantly more of this type of traffic enforcement than in most other communities throughout the state. In addition to reviewing stop type, the significant racial and ethnic disparity in search rates also warrants closer review by the department.

Researchers identified several shortcomings in the data collection conducted by the department. This included flawed residency, enforcement methods, and stop disposition information. There was a significant discrepancy in the information about whether the driver was a resident of the city or a Connecticut resident. There also appeared to be a misunderstanding in how officers defined "blind enforcement[13]" as well as how officers reported the statutory outcome of a stop (only in some cases). Lastly, officers that reported a misdemeanor summons as the disposition of a traffic stop often did not report the misdemeanor violation the driver was charged with.

Although we understand that large data collection efforts are never perfect, the quality of any analysis is always dependent on the overall quality of the data reported. In late 2020, the department started using a new records management system. This new system is currently used by most police departments in Connecticut. The program has significant safeguards built-in, which should dramatically improve the quality of Middletown's data. In the coming months, we will review the data submitted under the new system to help fill-in gaps that limited aspects of this analysis. Since the inception of this project, it has not been uncommon for similar data collection problems to be identified during a follow-up analysis. We consider it an opportunity to correct any data collection problems and are confident that the Middletown will continue to monitor their data trends in the months and years ahead.

[13] Officers must report whether a stop was made using general, blind, or spot check enforcement techniques. "Blind enforcement" is defined as a traffic stop that results from the use of technology such as a radar unit, laser unit, or license plate reader.

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