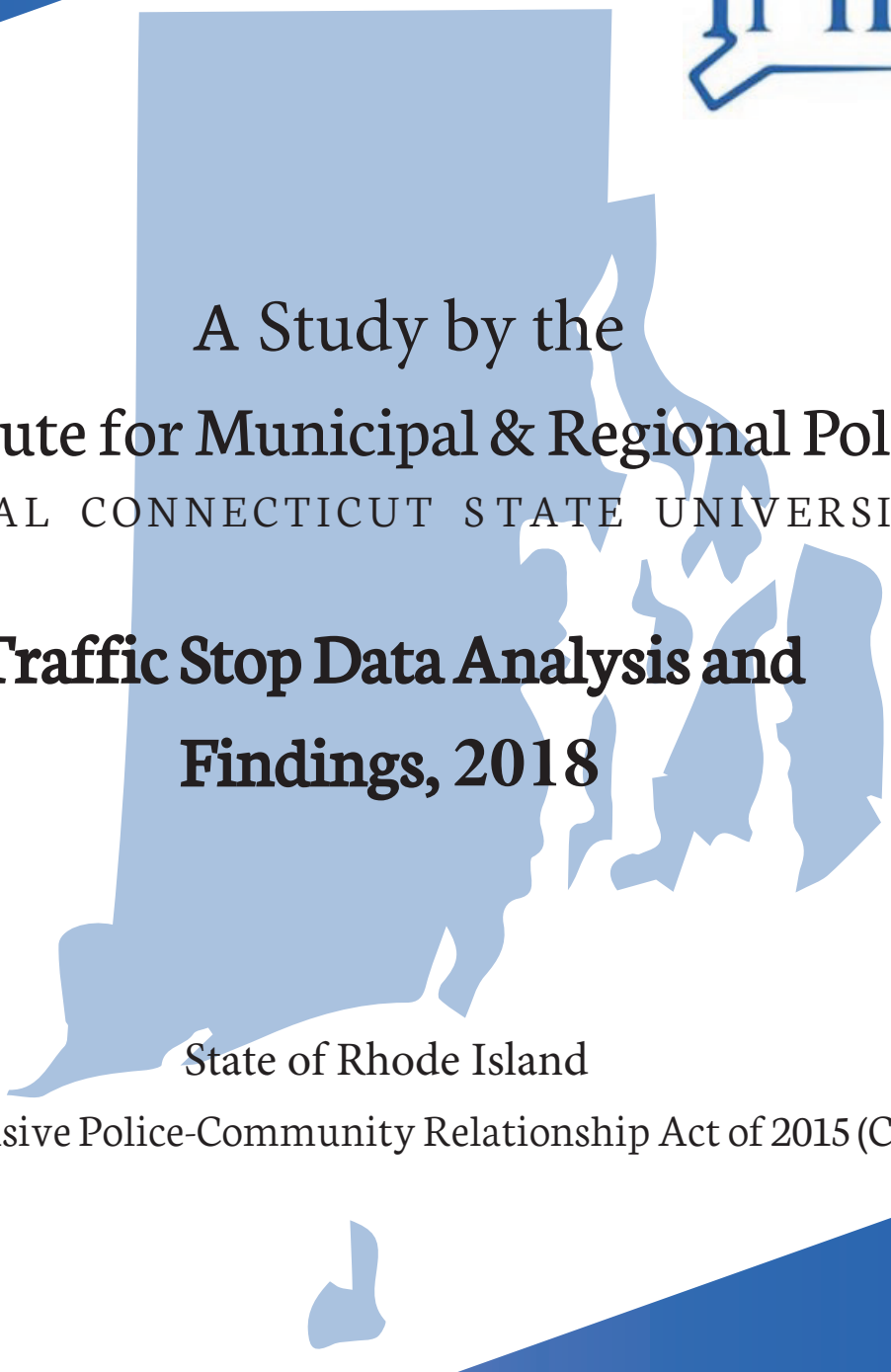

A Study by the

Institute for Municipal & Regional Policy

CENTRAL CONNECTICUT STATE UNIVERSITY

Traffic Stop Data Analysis and Findings, 2018

State of Rhode Island

Comprehensive Police-Community Relationship Act of 2015 (CCPRA)

Disclaimer

The Institute for Municipal and Regional Policy (IMRP) at Central Connecticut State University (CCSU) is the author of this report. The Representations, opinions, findings, and/or conclusions contained in this report are those of the authors and do not necessarily reflect the official policies or positions of the Rhode Island Department of Transportation.

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EXECUTIVE SUMMARY OF FINDINGS

On July 10, 2015 Governor Gina Raimondo signed House Bill, 2015-H 5819 Sub A, and Senate Bill, 2015-S 669 as Amended into law (R.I. Gen. Laws § 31-21.2-1 et seq.) The law, also known as the Comprehensive Police-Community Relationship Act of 2015 (CCPRA) "honors the community's desire for just stop and search procedures, while permitting law enforcement to maintain public safety and implement best practices."[1] One component of CCPRA requires the Rhode Island department of transportation to "conduct a study of routine traffic stops by the Rhode Island state police and each municipal police department in order to determine whether racial disparities in traffic stops exist, and to determine whether searches of vehicles and motorists are being conducted in a disparate manner." The following report is produced in fulfillment of this requirement.

CCPRA requires Rhode Island police departments to collect and report information on all traffic stops. Traffic stop data collection is completed for each routine traffic stop. The officer, directly following the stop, typically collects the information electronically. There are a total of sixteen data elements collected which gather information on the driver (race, ethnicity, age, gender) and the traffic stop (time of day, result of stop, search, etc.). Data is then sent to the Rhode Island Department of Transportation (RIDOT) where, on a quarterly basis, a summary report of the monthly data provided by each department and the state police is published.

This report presents the results from an analysis of approximately 237,000 traffic stops conducted between January 1, 2018 and December 31, 2018 by 37 municipal police departments[2], the Rhode Island State Police and two special police agencies[3]. This is the third analysis conducted by the Institute for Municipal and Regional Policy (IMRP) at Central Connecticut State University (CCSU) in Rhode Island.

The report is divided into two parts. Part I of this report serves as a screening tool, essentially highlighting areas where disparities between races and ethnicities are greatest in traffic enforcement throughout the state, thereby providing guidance as where to focus attention and resources for the next step of the process. It is important that readers understand the context of the initial findings in this report. There are many reasons for disparities to exist. Further analysis is presented in Part II on those specific departments identified with statistically significant disparities. By examining factors such as the location of accidents, call for service records, crime patterns, and areas of major traffic generators, readers will gain a better understanding of the nature of policing and the variety of factors that influence traffic enforcement in each identified community. It is during this part of the process that policymakers, citizens and law enforcement can best come together to understand and address the disparities present in those departments traffic stops.

Although Part II of this report only focuses attention and resources on specific departments identified with statistically significant disparities, 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-

[1] http://www.dot.ri.gov/community/CCPRA/index.php

[2] The New Shoreham Police Department did not report traffic stop information during this period.

[3] The two special police agencies are the University of Rhode Island and the Department of Environmental Management.

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 Rhode Island as they seek to fulfill the promise of the Comprehensive Police-Community Relationship Act of 2015. We are both humbled and grateful for the opportunity to be part of this important effort.

E.1: 2018 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 Rhode Island 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 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.

The research strategy underlying the statistical analysis presented in Part I 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 Rhode Island 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.*

Seven distinct analytical tools were used to evaluate whether racial and ethnic disparities are present in the Rhode Island 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 white non-Hispanic motorists.

First, a method referred to as the Solar Visibility analysis, also known as 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 Solar Visibility 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 Rhode Island. 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 Section V 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 2010 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. [4] 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.

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.

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

Across Rhode Island's municipal departments and State Police barracks, a total of 15.8 percent of motorists stopped during the analysis period were observed to be Black while 14.9 percent of stops were Hispanic motorists. The results from the Solar Visibility Analysis indicate that stopped motorists were more likely to be minorities during daylight relative to darkness suggesting the existing of a racial or ethnic

[4] 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 Rhode Island.

disparity in terms of the treatment of minority motorists relative to Caucasian motorists. The statewide results from the Solar Visibility Analysis were found to be robust to the addition of a variety of controls. The level of statistical significance remained relatively consistent in sign when the sample is reduced to only moving violations but become somewhat noisier when officer fixed-effects are included. The results from the post-stop analysis confirm that the statewide disparity carries through to post-stop behavior across all racial and ethnic groups. In aggregate, Rhode Island police departments exhibit a tendency to be less successful in motorist searches across all minority groups but most of this effect is concentrated in the subsample of stops made by municipal police.

It is important to note that it is impossible to clearly link any of these observed disparities to racial profiling as they may be driven by any combination of policing policy, heterogeneous enforcement patterns, or individual officer behavior.

Solar Visibility Analysis Findings, 2018

In an effort to better identify the source of these racial and ethnic disparities, each analysis was repeated at the department level. Although there is evidence of a disparity at the state level, it is important to note that specific departments are likely driving these statewide trends. 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.[5] 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 barracks where disparities could be a function of a number of factors including institutional culture, departmental policy, or individual officers.[6]

There was a total of four municipal departments identified to exhibit a statistically significant increase in the odds that a minority motorist is stopped during daylight. These departments include:

Bristol

The Bristol municipal police department was observed to have made 8.0 percent minority stops in 2018 of which 3.9 percent were Black and 2.9 percent were Hispanic. During the inter-twilight window, 2.5 percent of stops were Black and 2.3 percent were of Hispanic motorists. The Solar Visibility Analysis indicated a statistically significant disparity in the rate that both Black and Hispanic motorists were stopped during daylight relative to darkness. However, only the result for Hispanic motorists withstood our threshold of a ten percent false discovery rate. Within the inter-twilight window, the odds that a stopped motorist was Black and Hispanic motorists increased by 2.1 and 4.1 respectively during daylight. The results for Hispanic motorists were statistically significant at a level greater than 99 percent and robust to the inclusion of a variety of controls including officer fixed-effects as well as to a restricted subsample of moving violations.

[5] 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.

[6] 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.

Smithfield

The Smithfield municipal police department was observed to have made 15.9 percent minority stops in 2018 of which 6.7 percent were Black and 7.7 percent were Hispanic. During the inter-twilight window, 5.5 percent of stops were Black and 5.6 percent were of Hispanic motorists. The Solar Visibility Analysis indicated a statistically significant disparity in the rate that both Black motorists were stopped during daylight relative to darkness. Within the inter-twilight window, the odds that a stopped motorist was Black motorists increased by 2.1 during daylight. The results for Black motorists were statistically significant at a level greater than 99 percent and robust to the inclusion of a variety of controls including officer fixed-effects as well as to a restricted subsample of moving violations.

Warwick

The Warwick municipal police department was observed to have made 20.3 percent minority stops in 2018 of which 9.1 percent were Black and 9.4 percent were Hispanic. During the inter-twilight window, 14 percent of stops were Black and 14 percent were of Hispanic motorists. The Solar Visibility Analysis indicated a statistically significant disparity in the rate that both Black and Hispanic motorists were stopped during daylight relative to darkness. Within the inter-twilight window, the odds that a stopped motorist was Black and Hispanic motorists increased by 1.9 and 1.8 respectively during daylight. These results were statistically significant at a level greater than 99 percent and robust to the inclusion of a variety of controls including officer fixed-effects as well as to a restricted subsample of moving violations.

Westerly

The Westerly municipal police department was observed to have made 10.9 percent minority stops in 2018 of which 5.0 percent were Black and 3.4 percent were Hispanic. During the inter-twilight window, 5.2 percent of stops were Black and 3.1 were of Hispanic motorists. The Solar Visibility Analysis indicated a statistically significant disparity in the rate that Hispanic motorists were stopped during daylight relative to darkness. Within the inter-twilight window, the odds that a stopped motorist was Hispanic motorists increased by 2.1 during daylight. The results for Hispanic motorists were statistically significant at a level greater than 99 percent and robust to the inclusion of a variety of controls including officer fixed-effects as well as to a restricted subsample of moving violations.

Other Statistical and Descriptive Measure Analysis Findings, 2018

In addition to the four municipal police departments identified to exhibit statistically significant racial or ethnic disparities in the Solar Visibility analysis, 20 other municipal police departments and four State Police barracks were identified using a combination of the synthetic control method, 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 seven municipal police departments to have a disparity that was statistically significant at the 95 percent level in the Black or Hispanic alone categories. However, the disparities did not persist in all of these departments through robustness checks with a more restrictive modeling specification. In total, there were only five municipal police departments that withstood this more rigorous estimation procedure. Those departments are *Cumberland, Hopkinton, Lincoln, Middletown, and North Smithfield.*

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 20 municipal police departments were identified with racial and ethnic disparities when compared to one or more of the descriptive measures, only *Providence*, *North Smithfield, North Providence, Cranston, Pawtucket*, and *East Providence* exceeded the disparity threshold in more than half the benchmark areas.

In aggregate, minority motorists stopped by municipal police departments were found to have a statistically different distribution of outcomes conditional on the basis for which they were stopped. In the departmental analysis, there were 20 of 44 municipal departments and four State Police barracks were found to have a disparity in the distribution of outcomes. These differences were statistically significant at the 95 percent level or above in the Black or Hispanic alone categories. However, we note that the number of violations might be corelated with more severe outcomes and race. Since this variable is unobservable in the current data, we strongly caution the reader about drawing any conclusions from this section alone. The departments identified in this test include: *Bristol, Burrillville, Coventry, Cranston, Cumberland, East Greenwich, East Providence, Foster, Glocester, Hopkinton, Jamestown, Middletown, North Kingston, North Smithfield, Pawtucket, Portsmouth, South Kingstown, Warwick, Westerly, Woonsocket, RISP - Hope Valley, RISP- HQ, RISP- Lincoln, and RISP- Scituate.*

The results of the KPT Hit-Rate test, applied to the aggregate search data for all departments in Rhode Island show that departments are less successful in motorist searches across all minority groups, which is a potential indicator of disparate treatment. The *North Providence* municipal police department and *Lincoln State Police barracks* was found to have a disparity in the hit-rate of Black motorists relative to Caucasian Non-Hispanic motorists, which was statistically significant at the 95 percent level. However, the sample size did not warrant an analysis of the Black or Hispanic alone category and the analysis did not withstand the threshold of a 10 percent false discovery rate for either jurisdiction. Thus, we were unable to rule out the possibility that these departments were identified by chance.

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

Part I 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 the five analytical sections of the report (Veil of Darkness, Synthetic Control, Descriptive Statistics, Stop Disposition and KPT Hit-Rate). 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 solar visibility analysis
2. A statistically significant disparity in the synthetic control analyses and any one of the following analyses:
    a. Descriptive statistics
    b. KPT-hit rate
3. A statistically significant disparity in the descriptive statistics, stop disposition, and KPT hit-rate analyses.

Based on the above listed criteria it was recommended that an in-depth follow-up analysis should be conducted for the following departments: **(1) Bristol, (2) Smithfield, (3) Warwick, and (4) Westerly.** None of these four municipal departments have been identified in previous reports.

North Smithfield was also identified with racial and ethnic disparities in this study as well as in both the 2016 and 2017 Traffic Stop Data Analysis and Findings reports. An in-depth follow-up analysis, with recommendations, was previously completed for the department. The racial and ethnic disparities have remained consistent in each of the annual studies. Based on the results of the previously published follow-up analyses and our further understanding of traffic stop enforcement in North Smithfield, 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 report. The department should continue to review and monitor traffic enforcement policies to evaluate the disproportionate effect they could be having on minority drivers. They should also continue to take steps to assure that their minority community is fully engaged in the process of understanding why the allocation of enforcement resources are made and what outcomes are being achieved.

Although further analysis is important, a major objective of any review of possible racial profiling in Rhode Island 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 are an important tool used 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 their community.

E.2: 2018 FOLLOW-UP ANALYSIS

A total of four municipal police departments 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 four 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. The agencies identified were

Bristol, North Smithfield, Smithfield, Warwick, and Westerly. In Part II of this report researchers conducted an in-depth follow-up analysis for four of the five departments (Bristol, Smithfield, Warwick, and Westerly). A follow-up analysis, with recommendations, was previously completed for the North Smithfield Police Department as part of the 2016 report. The racial and ethnic disparities have remained consistent in each of the annual studies for North Smithfield. Based on the results of the previously published follow-up analysis and our further understanding of traffic stop enforcement in North Smithfield, we did 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 report. We would refer readers to the follow-up analysis for North Smithfield published in *2016 Supplemental Traffic Stop Analysis and Findings report* for more specific information on the department.

By conducting additional in-depth analyses on the four new police departments identified, 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 in-depth 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 in-depth analysis outlines additional descriptive measures that were applied to department-level data for the four municipal departments. In order to understand the factors that might be contributing to traffic enforcement decisions in the identified departments, researchers sought to understand where their respective traffic enforcement patterns occurred and why. Analyzing the traffic stops for each identified community by the reported location (i.e. patrol zone, street, neighborhood, etc.) was a primary means to conduct this analysis. A more detailed location analysis not only provided a more nuanced understanding of population demographics, but also allowed researchers to focus on the unique attributes of a subsection of a community such as major traffic generators, accident rates, local crime problems, and calls for service. The 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 is imperative to the success of this project that the conversation not end at the identification of departments with significant racial and ethnic disparities. Indeed, the individual department analysis proved enlightening for both researchers and departments. The 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.

PART I: 2018 TRAFFIC STOP ANALYSIS AND FINDINGS

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 Rhode Island 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.*
>
> *Principle 2: Apply a holistic approach for assessing racial and ethnic disparities in Rhode Island 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 Rhode Island 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 Solar Visibility analysis 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 Solar Visibility 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 Rhode Island. 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. [7] 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 Rhode Island 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.

[7] 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 Rhode Island.

II: CHARACTERISTICS OF TRAFFIC STOP DATA

This section examines general patterns of traffic enforcement activities in Rhode Island for the study period of January 1, 2018 to December 31, 2018. Statewide 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 B.

In Rhode Island, more than 249,000 traffic stops were conducted during the 12-month study period. Almost 82 percent of the total stops were conducted by the 37 municipal police departments, 17 percent of the total stops were conducted by state police, and the remaining 1 percent of stops were conducted by the two special police agencies[8]. Figure 2.1 shows the aggregate number of traffic stops by month along with each demographic category. As can be seen below, the volume of traffic stops varies seasonally.

Figure 2. 1: Aggregate Traffic Stops by Month of the Year

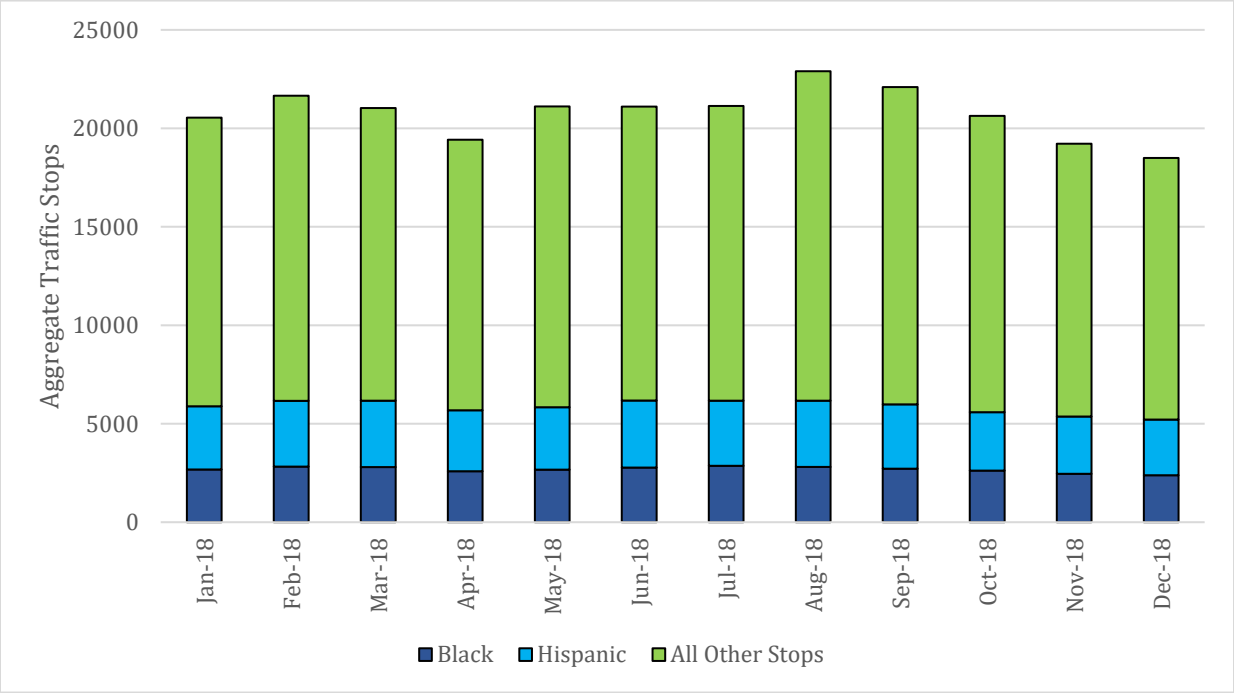


Figure 2.2 displays traffic stops by time of day for the entire analysis period. As can be seen from the figure, the total volume of traffic stops fluctuates significantly across different times of the day. The highest hourly volume of traffic stops in the sample occurred from five to six in the evening and accounted for 6.5 percent 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 Rhode Island. The lowest volume of traffic stops occurred between four and five in the morning and continued at a suppressed level during the morning commute.

[8]The special police agencies are the University of Rhode Island and the Department of Environmental Management.

The low level of traffic stops during the morning commute is likely due to an interest in maintaining a smooth flow of traffic during these hours. However, traffic enforcement does increase following morning commutation hours between 9:00 a.m. and 11:00 a.m.

The evening commute, in contrast to the morning 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 a significant period of traffic enforcement. In aggregate, stops occurring between these hours represented 17 percent of total stops.

Figure 2. 2: Aggregate Traffic Stops by Time of Day

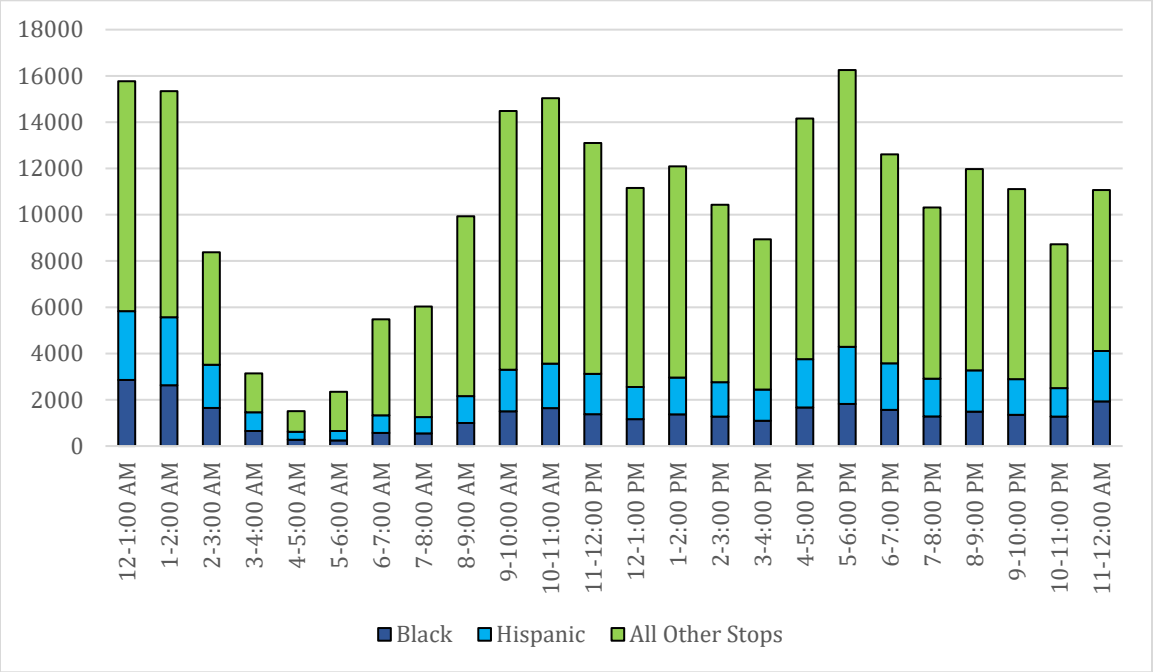
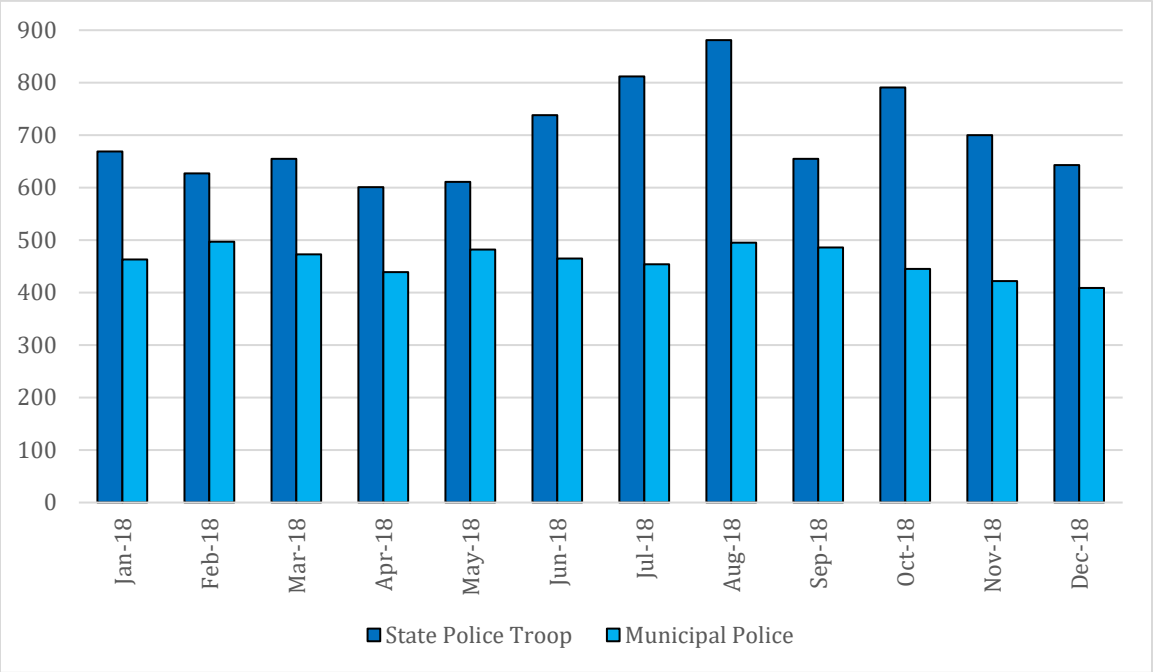


Figure 2.3 illustrates the average number of traffic stops by month for municipal police agencies and the state police. The data illustrates that municipal traffic stops peaks in February and August. The average number of traffic stops for municipal department's ranges from 409 to 497 each month for each agency. State police traffic stops by barracks are stable each month and range from a low of 601 to a high of 881.

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 accidents in dangerous areas, combat increased criminal activity, or respond to complaints from citizens. Those agencies with active traffic units may 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 Charlestown, Portsmouth, Little Compton, Cranston, and Warren. Conversely, Providence, East Greenwich, Lincoln, Cumberland, and Woonsocket 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.

Table 2. 1: Municipal Police, Highest and Lowest Rates of Traffic Stops

Town Name	16+ Population*	Traffic Stops	Stops per 1,000 Residents
Rhode Island	857,232	249,352	291
Municipal Departments with the Highest Rate of Traffic Stops			
Charlestown	6,524	4,519	693
Portsmouth	13,947	6,849	491
Little Compton	2,925	1,303	445
Cranston	66,140	28,734	434
Warren	8,910	3,516	395
Jamestown	4,533	1,657	366

Town Name	16+ Population*	Traffic Stops	Stops per 1,000 Residents
Narragansett	13,937	4,949	355
Burrillville	12,861	4,515	351
Central Falls	14,379	4,907	341
Hopkinton	6,586	2,246	341
Municipal Departments with the Lowest Rate of Traffic Stops			
Providence	141,451	13,146	93
East Greenwich	10,202	961	94
Lincoln	16,995	1,802	106
Cumberland	26,946	4,873	181
Woonsocket	32,349	6,037	187
Pawtucket	56,572	10,671	189
Tiverton	13,168	2,531	192
West Greenwich	4,854	933	192
North Providence	27,300	5,323	195
North Kingstown	21,033	4,271	203

* 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 Rhode Island between January 1, 2018 and December 31, 2018. Nearly two-thirds (63.1 percent) of motorists stopped were male. Almost half (44 percent) of motorists stopped were under the age of 30 compared to 21 percent over 50. The vast majority of stops in Rhode Island were white non-Hispanic motorists (69.5 percent); 12.9 percent were black non-Hispanic motorists; 15.3 percent were Hispanic motorists; and 2.3 percent were all other races non-Hispanic motorists.

Table 2. 2: Statewide Driver Characteristics

Race and Ethnicity		Gender		Residency		Age	
White	69.5%	Male	63.1%	Resident	29.5%	16 to 20	9.8%
						21 to 30	34.4%
Black	12.9%					31 to 40	21.0%
						41 to 50	14.0%
Hispanic	15.3%	Female	36.9%	Non-Resident	70.5%	51 to 60	12.0%
						Older than 61	8.8%
Other	2.3%						

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 (93 percent) as opposed to a stop made for an investigatory purpose or motorist assist. The most common violation drivers were stopped for was an undefined traffic violation (30 percent). Speeding was also a significant reason for stopping a driver with 29.5% of all stops being the result of speeding. After a driver was stopped, over 38% were given a ticket while most of the remaining drivers received some kind of a warning (53%). Statewide, less than 3 percent of traffic stops resulted in the arrest of a driver and only 3.8 percent of stops resulted in a search being conducted.

Table 2. 3: Statewide Stop Characteristics

Reason for Stop		Basis for Stop	
Investigatory	5.3%	Speeding	29.5%
Violation	93.1%	APB	0.2%
Assist	1.6%	Call for Service	4.2%
Outcome of Stop		Equipment/Inspection Violation	19.8%
		Motorist Assist	0.6%
Citation	38.3%	Other Traffic Violation*	29.9%
Warning	53.4%	Registration Violation	8.1%
Notice and Demand	1.0%	Seatbelt Violation	5.3%
Arrest Driver	2.8%	Suspicious Person	1.2%
Arrest Passenger	0.2%	Violation of Ordinance	0.5%
No Action	4.1%	Warrant	0.1%
Search Conducted	3.8%	Special Detail/Directed Patrol	0.6%

*If a stop was made for a reason other than one of the 11 categories listed as the basis for the stops, it is recorded as "other traffic violation." Some examples of stops that might be recorded as "other traffic violation" include a traffic light violation or stop sign violation.

In addition to the difference in the volume of traffic stops across communities, agencies stopped motorists for several different reasons. Police record the reason that lead to the motor vehicle stop. Those reasons are identified in 12 categories from speeding to registration violation to seatbelt violation. Other traffic violations are the most often cited reason for stopping a motor vehicle statewide, the results vary by jurisdiction. Although it is not clear what the specific "other" violation is, if a stop was made for a reason other than one of the 11 categories listed as the basis for the stop, it is recorded as "other traffic violation". As an example, this can include stops for traffic light violations or stop sign violations. Statewide almost 30 percent of all motorists were stopped for this reason. Table 2.4 presents the top 10 departments with the highest percentage of stops for other traffic violations.

Table 2. 4: Highest Other Traffic Violation Rates across All Departments

Department Name	Total Stops	Other Traffic Violation
East Greenwich	961	46.4%
Newport	6,431	46.3%
Pawtucket	10,671	45.5%
Bristol	4,761	44.3%
Cranston	28,734	39.8%
Central Falls	4,907	38.6%
Providence	13,146	37.4%
Smithfield	4,983	36.5%
North Providence	5,323	35.7%
Warwick	14,807	34.7%

Speeding is the next largest category cited as the reason for stopping a motor vehicle in Rhode Island. The average municipal police department stops for speeding violations was 38 percent compared to the state police average of 32 percent. In 10 departments, more than 50 percent of the traffic stops were for speeding violations. On the other hand, 11 departments stopped motorists for speeding less than 20 percent of the time. Table 2.5 shows the top 10 departments where speeding (as a percentage of all stops) was the most common reason for the traffic stop.

Table 2. 5: Highest Speeding Stop Rates across All Departments

Department Name	Total Stops	Speeding Violations
Foster	854	81.1%
Glocester	2,342	79.2%
Scituate	2,126	68.4%
Jamestown	1,657	61.0%
Charlestown	4,519	59.0%
Hopkinton	2,246	58.9%
Burrillville	4,515	56.7%
Richmond	1,741	56.3%
North Kingstown	4,269	52.4%
West Greenwich	933	50.2%

Some communities throughout the country 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 making the stop. Equipment and inspection related violations were the third most common reason for stopping a vehicle in the state. A statewide combined average for stopping a motorist for an equipment or inspection violation is 19.8 percent. Fourteen police departments exceeded the statewide average. Table 2.6 presents the top 10 departments with the highest percentage of stops for equipment or inspection violations.

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.

Table 2. 6: Highest Equipment/Inspection Violation Rates across All Departments

Department Name	Total Stops	Equipment/Inspection Violations
North Smithfield	3,253	54.4%
East Providence	12,832	37.9%
Newport	6,431	31.0%
Tiverton	2,531	29.0%
Coventry	7,087	27.7%
North Providence	5,323	27.4%
Portsmouth	6,849	27.3%
Cranston	28,734	26.2%

Department Name	Total Stops	Equipment/Inspection Violations
Little Compton	1,303	24.3%
Burrillville	4,515	23.7%

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.

More than half of all motorists stopped in Rhode Island received a warning, while 38 percent received a citation. Individual jurisdictions varied in their post-stop enforcement actions. Johnston issued infraction tickets in 75 percent of all traffic stops, which is the highest in the state. Newport only issued infraction tickets in 7 percent of all traffic stops, which is the lowest rate in the state. For state police, officers assigned to the Portsmouth Barracks issued the highest infractions (58 percent) and the Headquarters Barracks issued the lowest number of infractions (44 percent). Table 2.7 presents the highest infraction rates across all departments.

Table 2. 7: Highest Citation Rates across All Departments

Department Name	Total Stops	Citations Issued
Johnston	5,261	74.9%
Scituate	2,126	72.3%
North Providence	5,323	70.5%
Pawtucket	10,671	62.4%
Central Falls	4,907	60.7%
Smithfield	4,983	58.6%
RISP - Portsmouth	1,402	58.2%
RISP - Hope Valley	8,618	56.3%
Glocester	2,342	55.8%
Warren	3,516	54.5%

On the other hand, Newport issued warnings 92 percent of the time (the highest rate) and Johnston issued warnings 20 percent of the time (the lowest rate). Table 2.8 presents the highest warning rates across all departments.

Table 2. 8: Highest Warning Rates across All Departments

Department Name	Total Stops	Warnings Issued
Newport	6,431	92.4%
Little Compton	1,303	84.6%
Portsmouth	6,849	75.8%
Charlestown	4,519	74.4%
Jamestown	1,657	72.3%
Coventry	7,087	72.0%

Department Name	Total Stops	Warnings Issued
Burrillville	4,515	70.5%
Barrington	3,573	69.6%
Bristol	4,761	69.1%
West Greenwich	933	68.2%

Statewide, less than 3 percent of all traffic stops resulted in the driver being arrested and less than 0.2 percent of passengers were arrested. As with infraction tickets and warnings, municipal departments varied in the percentage of arrests associated with traffic stops. The North Smithfield Police Department arrested the most people as a result of a traffic stop, with 9.7 percent of all stops resulting in an arrest. Table 2.9 presents the highest arrest rates across all departments.

Table 2. 9: Highest Arrest Rates across All Departments

Department Name	Total Stops	Arrests
North Smithfield	3,253	9.7%
Providence	13,146	7.2%
West Warwick	5,646	6.7%
Woonsocket	6,035	6.6%
Cumberland	4,873	5.6%
RISP - HQ	2,284	5.4%
Central Falls	4,907	4.9%
Warwick	14,807	4.8%
Narragansett	4,949	4.6%
RISP - Lincoln	12,558	4.1%

Rarely do traffic stops in Rhode Island result in the search of a vehicle, passenger or driver. During the study period, only 3.8 percent of all traffic stops resulted in a search. Although searches are rare in Rhode Island, they do vary across jurisdictions and the data provides information about enforcement activity throughout the state. Eight departments exceeded the statewide average for searches, but the highest percentage was found in Providence (28.2 percent), Woonsocket (8.9 percent), North Smithfield (7.3 percent) and East Providence (6.2 percent). Table 2.10 presents the highest search rates across all departments.

Table 2. 10: Highest Search Rate across All Departments

Department Name	Total Stops	Resulted in Search
Providence	13,146	28.2%
Woonsocket	6,035	8.9%
North Smithfield	3,253	7.3%
East Providence	12,832	6.2%
Tiverton	2,531	5.3%
Little Compton	1,303	4.5%
Pawtucket	10,671	4.5%
Jamestown	1,657	3.9%
Westerly	4,871	3.8%
Hopkinton	2,246	3.5%

III: ANALYSIS OF TRAFFIC STOPS, SOLAR VISIBILITY

The Solar Visibility Analysis test of racial and ethnic disparities in police traffic stop data 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).[9] 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 vs. 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, within a restricted sample of stops, does not vary in response to changes in visibility.[10] Here, the racial composition of stops in darkness serves as a counterfactual for those made in daylight, i.e. when officers can better observe race.

More specifically, the Solar Visibility Analysis method evaluates whether there exist statistically significant disparities 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 week. To further control for inherent differences in daylight and darkness, the sample is restricted to the inter-twilight window, a period when Solar Visibility Analysis 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 SOLAR VISIBILITY, 2018

Table 3.1 presents the results from applying the solar visibility test to the data at the aggregate stat level during the inter-twilight window. The results were estimated using Equation 4 of Appendix A.2 with the standard errors clustered by department. The estimates include controls for time of day, day of week, and department fixed-effects. The estimates rely on four definitions of minority status that are compared to Caucasian Non-Hispanics and annotated accordingly. The minority definitions across each specification are not mutually exclusive in that 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

[9] Applications of the so-called Veil of Darkness (herein the "Solar Visibility") 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 Rhode Island and Rhode Island; 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.

[10] 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.

fourth specification includes both Black and Hispanic motorists (i.e. combines the second and third specifications). The omitted group across all specifications consists of stops made of motorists observed to be from Caucasian and Non-Hispanic descent.

As shown below, all of the coefficient estimates are all statistically significant and positive. Thus, there is a change in the odds that a stopped motorist is a minority in daylight relative to darkness. The finding held true for both Black and Hispanic motorists. As previously mentioned, (details in Appendix A.2), we should expect that there will be a direct correspondence between changes to the odds-ratio for stopped motorists and that of motorists at risk of being stopped. This will be true as long as the assumption of a constant relative risk-set holds. Thus, a positive change in the odds that a stopped motorist in daylight is a minority suggests the possible presence of discrimination. Since these estimates are conducted at an aggregate level, they should be interpreted as a statewide average. Similar results were found through the application of several robustness checks including restricting the sample to moving violations (Table 3.4, for Black motorists only), including officer rather than department fixed-effects (Appendix C, Table C.1 for all minority groupings), and the combination these alternative specifications (Appendix C, Table C.4 for Black motorists only).

Table 3. 1: Logistic Regression of Minority Status on Daylight with Department Fixed-Effects, All Traffic Stops 2018

LHS: Minority Status		Non-Caucasian	Black	Hispanic	Black or Hispanic
Daylight	Coefficient	0.263***	0.180***	0.150***	0.150***
	Standard Error	(0.034)	(0.029)	(0.034)	(0.028)
Sample Size		49,823	47,030	47,153	53,687
Pseudo R^2		0.123	0.149	0.187	0.167

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 rate greater than 10 percent.
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 2018.

Table 3.2 presents the results estimated from the subsample of all municipal police departments during the inter-twilight window in 2018. The results control for time of day, day of week, and department fixed-effects. Standard errors are clustered by department. The coefficient estimates on daylight are all positive and statistically significant at a level above 95 percent. Here, we again interpret the results as providing strong evidence of a disparity in the aggregate subsample of municipal departments for both Black and Hispanic motorists. As before, similar results were found through the application of several robustness checks including restricting the sample to moving violations (Table 3.5) and officer rather than department fixed-effects (Appendix C, Table C.2).The combination these alternative specifications (i.e. officer fixed-effects with the sample of moving violations) are only marginally significant but consistent in sign (Appendix C, Table C.5).

Table 3. 2: Logistic Regression of Minority Status on Daylight, Municipal Traffic Stops 2018

LHS: Minority Status		Non-Caucasian	Black	Hispanic	Black or Hispanic
Daylight	Coefficient	0.259***	0.174***	0.143***	0.143***
	Standard Error	(0.041)	(0.034)	(0.037)	(0.03)
Sample Size		44,483	42,176	42,330	48,082
Pseudo R^2		0.126	0.164	0.207	0.185

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 rate greater than 10 percent.
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 2018.

Table 3.3 presents the results estimated from a subsample of all State Police barracks during the inter-twilight window in 2018. The results control for time of day, day of week, and department fixed-effects. Standard errors are clustered by barracks. The coefficient estimates on daylight are all positive and statistically significant at a level above 95 percent. As with the statewide and municipal samples, the results indicate a statistically significant disparity in the likelihood of a minority motorist being stopped in daylight. Results similar in magnitude and with comparably sized standard errors were found through the application of several robustness checks including restricting the sample to moving violations (Table 3.6), officer rather than department fixed-effects (Appendix C, Table C.3), and the combination these alternative specifications (Appendix C, Table C.6).

Table 3. 3: Logistic Regression of Minority Status on Daylight, State Police Traffic Stops 2018

LHS: Minority Status		Non-Caucasian	Black	Hispanic	Black or Hispanic
Daylight	Coefficient	0.241**	0.214**	0.231**	0.232***
	Standard Error	(0.098)	(0.104)	(0.111)	(0.079)
Sample Size		4,366	4,213	4,195	4,903
Pseudo R^2		0.023	0.021	0.027	0.02

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 rate greater than 10 percent.
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 2018.

As mentioned, the prior set of estimates aggregate all traffic stops across multiple departments and should be considered an average treatment effect from quasi-random variation in the timing of sunset. Although the results from this section indicate statistically significant disparity in the rate of minority traffic stops, they do not identify the specific geographic source of that disparity. The results of a department-level analysis are presented in a later section and better identify the source of specific department-wide disparities. However, 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 stops (e.g. headlight, seatbelt, and cell phone violations) may be correlated with darkness and minority status. Indeed, we might expect that including these types of stops may bias the coefficient estimates towards zero and makes it less likely that we would detect discrimination.

III.B: AGGREGATE ROBUSTNESS CHECKS WITH SOLAR VISIBILITY, 2018

This section presents robustness checks on the initial specifications using a more restrictive subsample that includes only moving violations. As mentioned, an analysis using all violations is potentially biased by specific violations that are correlated with visibility and minority status. To see why this might be a problem, imagine that minority motorists are more likely to have a broken headlight or taillight and that these violations are only observable to police during darkness. In that instance, comingling equipment violations with other moving violations might make it likely that more minorities stopped at night. Even in the presence of discrimination, these types of violations might have a large enough effect to bias the test statistic towards zero. In contrast, cellphone and seatbelt violations have the potential to bias the results upward if they are only observable to police in daylight and correlated with race. Since both of these scenarios seem reasonable and the net effect of the bias is unclear, a reasonable robustness check is to simply limit the sample of traffic stops to moving violations.

Table 3.4 presents the aggregate results estimated from a sample of moving violations made during the inter-twilight window in 2018. As before, these results were estimated with the standard errors clustered by department. The estimates include controls for time of day, day of week, and department fixed-effects. The coefficient for all of the minority groupings is statistically significant and positive. This finding indicates that there is potentially a disparity for the state as whole and that it persists even when the sample is restricted to exclude stops that are potentially correlated with race and visibility. Adding a high-dimensional set of officer fixed-effects (Appendix C, Table C.4) increases the precision of the estimates such that all of the specifications are positive and significant, but the point estimates are slightly attenuated. Although it is impossible to clearly 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 that minority motorists are being treated differently by police.

Table 3. 4: Logistic Regression of Minority Status on Daylight with Department Fixed-Effects, All Moving Violations 2018

LHS: Minority Status		Non-Caucasian	Black	Hispanic	Black or Hispanic
Daylight	Coefficient	0.261***	0.144***	0.109***	0.109***
	Standard Error	(0.041)	(0.034)	(0.037)	(0.028)
Sample Size		35,751	33,241	33,467	37,469
Pseudo R^2		0.128	0.15	0.202	0.175

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 rate greater than 10 percent.
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 moving violations made during the inter-twilight window in 2018.

Table 3.5 presents the aggregate results estimated from a sample of municipal moving violations made during the inter-twilight window in 2018. As before, these results were estimated with the standard errors clustered by department. The estimates include controls for time of day, day of week, and department fixed-effects. The estimates again show a statistically significant disparities across all groupings of minority motorists. As before, the results indicate that municipal departments stop more Non-Caucasian motorists during daylight even after the sample is restricted to moving violations Adding a high-dimensional set of

officer fixed-effects (Appendix C, Table C.5) increases the precision of the estimates. As before, we note that these are aggregate estimates and should be treated as such.

Table 3. 5: Logistic Regression of Minority Status on Daylight, Municipal Moving Violations 2018

LHS: Minority Status		Non-Caucasian	Black	Hispanic	Black or Hispanic
Daylight	Coefficient	0.259***	0.143***	0.096**	0.101***
	Standard Error	(0.054)	(0.041)	(0.043)	(0.032)
Sample Size		31,996	29,924	30,173	33,649
Pseudo R^2		0.125	0.165	0.223	0.193

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 rate greater than 10 percent.
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 moving violations made during the inter-twilight window in 2018.

Table 3.6 presents the results from the subsample of State Police moving violations during the inter-twilight window. As before, these results were estimated with the standard errors clustered by barracks. The estimates include controls for time of day, day of week, and department fixed-effects. The coefficient estimates are positive across all groupings but only significant for Hispanics indicating that the odds this group is stopped increases in daylight. The results are similar when a high dimensional set of officer fixed-effects are added (see Appendix C, Table C.6). Since the patrol areas of State Police officers varies widely even within individual barracks, this finding is not entirely surprising and does indeed suggest the presence of a disparity. As before, we note that this disparity could be the product of explicit or implicit police discrimination as well as remaining unobserved changes to speed enforcement that are correlated with both race/ethnicity and daylight.

Table 3. 6: Logistic Regression of Minority Status on Daylight, State Police Moving Violations 2018

LHS: Minority Status		Non-Caucasian	Black	Hispanic	Black or Hispanic
Daylight	Coefficient	0.216*	0.174	0.259**	0.215**
	Standard Error	(0.116)	(0.122)	(0.111)	(0.09)
Sample Size		2,943	2,824	2,800	3,274
Pseudo R^2		0.025	0.023	0.026	0.019

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 rate greater than 10 percent
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 moving violations made during the inter-twilight window in 2018.

The results presented in the state-level analysis provide strong evidence that a disparity exists in the rate of minority traffic stops by Rhode Island police in 2018. Although restricting the sample to moving violations reduces our estimation power, we find daylight has a positive effect on the odds that a minority motorist is stopped by police across all minority groupings. Thus, we conclude that minority motorists are disproportionately more likely to be stopped by Rhode Island police during periods of daylight suggesting possible adverse treatment. In the preceding section, the test will be applied to both individual municipal departments and State Police barracks.

III.C: DEPARTMENT ANALYSIS WITH SOLAR VISIBILITY, 2018

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 does not investigate the source of these disparities in terms of specific municipal police departments or State Police barracks. The analysis presented in this section seeks to better identify the sources of that disparity by running the same test for individual departments and State Police barracks.

In this section, we estimate Equation 4 of Appendix A.2 separately for each municipal department and State Police barracks. Thus, each set of estimates includes a vector of town-specific controls for time of day, day of week, and department fixed-effects. We identify all departments and State Police barracks found to have a disparity that is statistically significant at the 95 percent level in either of the Hispanic or Black alone minority groups. The full set of results are contained in Table C.7 of Appendix C. Although we do not include officer fixed or restrict the sample to moving violations here, Appendix C, Tables C.8, C.9 and C.10 contain results with these more rigorous specifications. As discussed in detail below, we annotate those departments that do not withstand the scrutiny of the robustness checks.

Table 3.7 presents the results from estimating the solar visibility test statistic for individual departments using the 2018 sample. There were eight municipal departments and two State Police troops found to have a disparity that was statistically significant at the 95 percent level in the Black or Hispanic categories and which had a false discovery rate below 10 percent. Only four of the municipal departments and none of the State Police troops survived the robustness checks which included officer fixed-effects, restricting the sample to moving violations, and the combination of these specifications. The results indicate that minority motorists are more likely to be stopped by police in daylight by the Bristol, Smithfield, Warwick, and Westerly police departments. For the four departments identified, we conclude that there is strong evidence that a disparity exists in the rate of minority traffic stops made during high visibility conditions. Although it is impossible to clearly 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 that minority motorists are being treated differently by police in these areas.

Table 3. 7: Logistic Regression of Minority Status on Daylight, Select Department Traffic Stops 2018

Department	Variable	Non-Caucasian	Black	Hispanic	Black or Hispanic
Bristol	Coefficient	1.968***	0.754+	1.422***	0.964***
	Standard Error	(0.439)	(0.446)	(0.388)	(0.321)
	P-Value	0.001	0.092	0	0.003
	Q-Value	0.001	0.218	0.001	0.012
	Effective Sample	1469	1380	1377	1409
	Pseudo R2	0.122	0.024	0.056	0.025

Department	Variable	Non-Caucasian	Black	Hispanic	Black or Hispanic
Cranston +	Coefficient	0.140+	0.199**	0.057	0.079
	Standard Error	(0.082)	(0.085)	(0.094)	(0.076)
	P-Value	0.093	0.019	0.550	0.305
	Q-Value	0.218	0.071	0.643	0.463
	Effective Sample	5358	5101	5409	6472
	Pseudo R2	0.004	0.004	0.003	0.003
North Providence +	Coefficient	-0.024	0.041	0.321**	0.135
	Standard Error	(0.180)	(0.141)	(0.130)	(0.126)
	P-Value	0.893	0.765	0.014	0.284
	Q-Value	N/A	0.815	0.054	0.460
	Effective Sample	1314	1292	1242	1524
	Pseudo R2	0.014	0.014	0.014	0.008
North Smithfield +	Coefficient	0.462***	0.469***	0.552++	0.501***
	Standard Error	(0.101)	(0.086)	(0.277)	(0.138)
	P-Value	0.001	0.001	0.046	0
	Q-Value	0.001	0.001	0.123	0.001
	Effective Sample	737	698	743	864
	Pseudo R2	0.018	0.018	0.013	0.013
Portsmouth +	Coefficient	0.485***	0.435++	0.615***	0.492***
	Standard Error	(0.150)	(0.204)	(0.172)	(0.120)
	P-Value	0.001	0.034	0	0.001
	Q-Value	0.006	0.105	0.001	0.001
	Effective Sample	1388	1366	1305	1458
	Pseudo R2	0.014	0.013	0.028	0.013
RISP- Hope Valley +	Coefficient	0.222	0.372	0.469**	0.397+
	Standard Error	(0.231)	(0.263)	(0.194)	(0.224)
	P-Value	0.337	0.158	0.016	0.076
	Q-Value	0.493	0.289	0.059	0.189
	Effective Sample	860	811	793	930
	Pseudo R2	0.013	0.020	0.020	0.016
RISP- Scituate +	Coefficient	0.398	0.623++	0.671***	0.675***
	Standard Error	(0.250)	(0.291)	(0.203)	(0.184)
	P-Value	0.112	0.032	0.001	0
	Q-Value	0.224	0.105	0.004	0.001
	Effective Sample	576	561	599	671
	Pseudo R2	0.028	0.030	0.032	0.026

Department	Variable	Non-Caucasian	Black	Hispanic	Black or Hispanic
Smithfield	Coefficient	0.666***	0.727***	0.345	0.531***
	Standard Error	(0.174)	(0.230)	(0.324)	(0.131)
	P-Value	0	0.002	0.286	0.001
	Q-Value	0.001	0.007	0.460	0.001
	Effective Sample	1257	1240	1241	1304
	Pseudo R2	0.026	0.034	0.017	0.017
Warwick	Coefficient	0.958***	0.640***	0.574***	0.575***
	Standard Error	(0.083)	(0.079)	(0.151)	(0.100)
	P-Value	0.001	0.001	0	0.001
	Q-Value	0.004	0.001	0.001	0.001
	Effective Sample	3825	3425	3424	3819
	Pseudo R2	0.030	0.017	0.012	0.014
Westerly	Coefficient	-0.023	0.199	0.725***	0.367
	Standard Error	(0.225)	(0.286)	(0.277)	(0.294)
	P-Value	0.919	0.485	0.008	0.212
	Q-Value	N/A	0.643	0.039	0.372
	Effective Sample	1079	1041	1018	1070
	Pseudo R2	0.034	0.043	0.032	0.024

Note 1: 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. Variables concatenated with a + in place of a *, were found to have a false discovery rate greater than 10 percent.
Note 2: All specifications include controls for time of the day and day of the week.
Note 3: Sample includes all traffic stops made during the inter-twilight window in 2018.
Note 4: 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).
+ Results are not robust across subsequent specifications.
++ Results are significant for the moving violation sample only.

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. Despite their flaws, these approaches are intuitively appealing because they offer tangible easily interpreted measures of racial and ethnic disparities. 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 individual 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 stop.[11]

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 7PM 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 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 allows 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 have recently entered the criminal justice literature through notable applications by McCaffrey et al. (2004), Ridgeway (2006), and Ridgeway and MacDonald (2009).

[11] 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, 2018

Each individual 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 Caucasian Non-Hispanics. As before, we identify all departments found to have a disparity that is statistically significant at the 95 percent level in either the Hispanic or Black alone minority group. The full set of results for all departments can be found in Table D.1 of Appendix D. Although we do not use doubly-robust estimation here, Table D.2 of Appendix D contains results with this more rigorous modeling specification. So-called doubly-robust estimation is when the treatment regression is estimated with the variables used to construct the propensity score also included as controls in the model. Note that significantly more departments are identified in these estimates than those using doubly-robust estimation which indicates that in some departments, the results fail on balance. Thus, we present results here for departments identified using the less rigorous specification but only confidently identify those that withstand the more rigorous approach.

Table 4.1 presents the results from estimating treatment effects of individual departments relative to their requisite synthetic control using the 2018 sample. There were six municipal departments found to have a disparity that was statistically significant at the 95 percent level in the Black or Hispanic categories and which had a false discovery rate below 10 percent. The disparities in all of these departments did not persist through the more restrictive modeling specifications with doubly-robust estimation. In particular, Foster did not withstand double-robust estimation suggesting that their control group is poorly matched to their overall distribution of covariates. Although Portsmouth was not found to have a disparity in this initial test, the subsequent doubly-robust estimates revealed a higher likelihood of Black motorists being stopped relative to their control. In total, there were six municipal departments that were identified including Cumberland, Hopkinton, Lincoln, Middletown, North Smithfield, and Portsmouth.

Table 4. 1: Inverse Propensity Score Weighted Logistic Regression of Minority Status on Treatment, Select Department Traffic Stops 2018

Department	Variable	Non-Caucasian	Black	Hispanic	Black or Hispanic
Cumberland	Coefficient	-0.008	0.017***	0.070***	0.082***
	Standard Error	(0.004)	(0.004)	(0.004)	(0.006)
	P-Value	0.104	0.001	0.001	0.001
	Q-Value	N/A	0.001	0.004	0.004
	Effective Sample	197413	197413	197413	197413
	Pseudo R2	N/A	N/A	N/A	N/A
Foster+	Coefficient	0.063***	0.029	0.035***	0.065***
	Standard Error	(0.008)	(0.001)	(0.007)	(0.013)
	P-Value	0.001	N/A	0.001	0.001
	Q-Value	0.001	N/A	0.001	0.001
	Effective Sample	21974	21974	21974	21974
	Pseudo R2	N/A	N/A	N/A	N/A

Department	Variable	Non-Caucasian	Black	Hispanic	Black or Hispanic
Hopkinton	Coefficient	0.071***	0.041	0.026**	0.063***
	Standard Error	(0.019)	(0.001)	(0.010)	(0.016)
	P-Value	0	N/A	0.018	0.001
	Q-Value	0.001	N/A	0.070	0.001
	Effective Sample	29900	29900	29900	29900
	Pseudo R2	N/A	N/A	N/A	N/A
Lincoln	Coefficient	0.028***	0.027***	0.103***	0.116***
	Standard Error	(0.008)	(0.007)	(0.008)	(0.009)
	P-Value	0	0	0.001	0.001
	Q-Value	0.001	0.001	0.004	0.004
	Effective Sample	197413	197413	197413	197413
	Pseudo R2	N/A	N/A	N/A	N/A
Middletown	Coefficient	0.027***	0.043***	-0.037+++	0.009+
	Standard Error	(0.006)	(0.004)	(0.004)	(0.006)
	P-Value	0.001	0.001	0.001	0.098
	Q-Value	0.001	0.001	N/A	0.324
	Effective Sample	197413	197413	197413	197413
	Pseudo R2	N/A	N/A	N/A	N/A
North Smithfield	Coefficient	0.215***	0.180***	0.148***	0.277***
	Standard Error	(0.009)	(0.008)	(0.043)	(0.041)
	P-Value	0.001	0.001	0.001	0.001
	Q-Value	0.004	0.004	0.001	0.001
	Effective Sample	186666	186666	186666	186666
	Pseudo R2	N/A	N/A	N/A	N/A
Portsmouth ++	Coefficient	0.012	0.037+	-0.024	0.010
	Standard Error	(0.027)	(0.020)	(0.028)	(0.034)
	P-Value	0.660	0.072	0.405	0.751
	Q-Value	1	0.250	N/A	1
	Effective Sample	192156	192156	192156	192156
	Pseudo R2	N/A	N/A	N/A	N/A

Note 1: 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. Variables concatenated with a + in place of a *, were found to have a false discovery rate greater than 10 percent.
Note 2: Propensity scores were estimated using principal components analysis of traffic stop characteristics as well as Census data selected using the Kaiser-Guttman stopping rule. Traffic stop characteristics include time of the day, day of the week, month, department traffic stop volume, officer traffic stop volume, and type of traffic stop. Census demographics for both the primary and border towns include retail employment, entertainment employment, commuting population, vacant housing, rental housing, median earnings, population density, gender, age, race, and ethnicity.
Note 3: Sample includes all traffic stops made by the primary department and an inverse propensity score weighted sample of all other departments from October 2013 to September 2018.
Note 4: 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).
+ Results are not robust across subsequent specifications.

As noted previously, only six departments identified above persisted through the additional robustness check contained in the Table D.2 of Appendix D. However, it is impossible to determine whether these robustness checks invalidated the findings in Table 18 or whether a balanced synthetic control is impossible to construct given the unique nature of these departments. Although it is impossible to clearly 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 that there are more minority motorists stopped by police in these departments even after accounting for geographic and economic differences as well as the type and timing of enforcement activity.

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

The descriptive statistics and benchmarks presented in this section help to understand patterns in Rhode Island 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 Minority Motorists to the State Average

The first category involves all motorists classified as “Minority.” This Minority category includes all racial classifications except for white motorists. Specifically, it covers Black, Hispanic, Asian/Pacific Islander, American Indian/Alaskan Native, and Other Race classifications included in the census data.

For the study period, the statewide percentage of stopped motorists who were identified as Minority was 30.5 percent. Eight departments stopped a higher percentage of Minority motorists than the state average, five of which exceeded the state average by more than 10 percentage points. The statewide average for Minority residents (16+) is 20.4 percent. Of the eight towns that exceeded the statewide average for Minority motorists stopped, four also have Minority resident populations (16 +) that exceeded the statewide average.

After the stop resident population percentages were adjusted using the method described in Appendix A.4 (2), a total of four 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 four towns. All department results are contained in the Table E.1 of Appendix E.

Table 5. 1: Statewide Average Comparisons for Minority Motorists 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
North Smithfield	42.3%	11.8%	3.5%	-16.9%	28.7%
North Providence	38.0%	7.5%	14.4%	-6.0%	13.5%
Cranston	41.9%	11.4%	20.3%	-0.1%	11.5%
Providence	78.2%	47.7%	56.9%	36.5%	11.2%

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 12.9 percent. Seven departments stopped a higher percentage of Black motorists than the state average, two of which exceeded the statewide average by more than 10 percentage points. The statewide average for Black residents (16+) is 4.5 percent. Of the seven towns that exceeded the statewide average for Black motorists stopped, five 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.4 (2), there was only one town found to have a relative distance between their net Black driver stop percentage and net Black population percentage of more than 10 points. Table 5.2 shows the data for this one town. Results for all departments are contained in the Table E.2 of Appendix E.

Table 5. 2: Statewide Average Comparisons for Black Motorists 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
Providence	31.2%	18.3%	12.40%	7.9%	10.4%

Comparison of Hispanic Motorists to the Statewide Average

For the study period, the statewide percentage of motorists stopped by police who were identified as Hispanic was 15.3 percent. Eight towns stopped a higher percentage of Hispanic motorists than the state average, only three of which exceeded the statewide average by more than 10 percentage points. The statewide Hispanic resident population (16+) is 10.5 percent. The ratio of stopped Hispanic motorists to Hispanic residents (16+) on a statewide basis was slightly higher (15.3 percent Hispanic motorists stopped/10.5 percent Hispanic residents). Of the eight towns that exceeded the statewide average for Hispanic motorists stopped, four 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.4 (2), only North Smithfield was 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 this department. All department results are contained in the Table E.3 of Appendix E.

Table 5. 3: Statewide Average Comparisons for Hispanic Motorists 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
North Smithfield	23.4%	8.1%	1.8%	-8.7%	16.8%

V.B: ESTIMATED COMMUTER DRIVING POPULATION COMPARISON

Adjusting "static" residential census data to approximate the estimated driving demographics in a particular jurisdiction provides a more accurate benchmark method than previous census-based approaches. At any given time, nonresidents may use any road to commute to work or travel to and from entertainment venues, retail centers, tourist destinations, etc. in a particular town. It is impossible to account for all driving in a community at any given time, particularly for the random, itinerant driving trips sometimes made for entertainment or recreational purposes. However, 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 methodology is an estimate of the composition of the driving population during typical commuting hours. A detailed explanation of the methodology can be found in Appendix A.4.

The Estimated Commuter Driving Population (EDP) analysis was confined to the 37 municipal police departments[12] in Rhode Island. 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, 33 departments had a disparity between the Minorities stopped and the proportion of non-whites estimated to be in the EDP. For many of these departments (14) the disparity was very small (less than five percentage points). In the remaining four communities, the disparity was negative, meaning that more whites were stopped than expected in the EDP numbers. However, the negative disparities were also very small in most communities. All departments had a disparity for Black motorists stopped and 31 departments with a disparity for Hispanic motorists 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. In addition, departments that exceeded their EDP percentage by more than five but less

[12] The New Shoreham Police Department did not report traffic stop information during this period.

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. All department results are contained in the Table E.4, Table E.5, and Table 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)					
Providence	3,283	71.6%	40.3%	31.3%	1.78
North Smithfield	697	35.4%	7.4%	28.0%	4.79
Cranston	7,568	38.4%	19.9%	18.5%	1.93
North Providence	1,787	33.5%	15.8%	17.7%	2.12
Pawtucket	2,970	47.3%	34.6%	12.7%	1.37
East Providence	3,182	28.9%	16.7%	12.2%	1.73
Johnston	2,793	24.2%	12.4%	11.8%	1.95
Lincoln	431	23.9%	13.1%	10.8%	1.82
Hopkinton	662	14.0%	3.4%	10.6%	4.13
Black (Non-Hispanic)					
Providence	3,283	27.8%	8.9%	18.9%	3.12
North Providence	1,787	16.3%	4.1%	12.2%	3.97
North Smithfield	697	12.8%	1.1%	11.7%	11.88
Pawtucket	2,970	21.1%	9.5%	11.6%	2.22
East Providence	3,182	16.4%	4.9%	11.5%	3.33
Hispanic (All Racial Groups)					
Providence	3,283	41.0%	22.9%	18.1%	1.79
North Smithfield	697	21.2%	3.7%	17.6%	5.78
Cranston	7,568	22.0%	9.4%	12.6%	2.35

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)					
Foster	162	10.5%	1.0%	9.5%	10.49
Portsmouth	1,853	15.5%	6.9%	8.6%	2.24
Glocester	931	9.9%	2.3%	7.6%	4.30
Tiverton	505	10.9%	4.1%	6.8%	2.66
Warren	1,276	12.1%	5.6%	6.5%	2.17
Barrington	1,031	12.3%	6.5%	5.8%	1.90
Black (Non-Hispanic)					
Central Falls	1,730	15.6%	6.7%	8.9%	2.33
Cranston	7,568	12.9%	4.5%	8.3%	2.83
Middletown	811	11.8%	3.8%	8.1%	3.14
Johnston	2,793	8.8%	2.5%	6.3%	3.46
Woonsocket	1,679	10.7%	4.5%	6.1%	2.35

Department Name	Number of Stops	Stops	EDP	Absolute Difference	Ratio
Portsmouth	1,853	7.7%	1.7%	6.0%	4.63
Hopkinton	662	6.2%	0.3%	5.9%	23.26
Warwick	3,853	7.7%	2.4%	5.4%	3.27
Warren	1,276	6.6%	1.4%	5.2%	4.82
Hispanic (All Racial Groups)					
Lincoln	431	14.8%	6.0%	8.8%	2.46
North Providence	1,787	15.9%	7.3%	8.6%	2.18
Woonsocket	1,679	17.1%	9.9%	7.2%	1.73
Johnston	2,793	13.5%	6.3%	7.2%	2.14
East Providence	3,182	11.0%	5.1%	5.9%	2.14
Foster	162	5.6%	0.5%	5.1%	11.02

V.C: RESIDENT ONLY STOP COMPARISON

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 2010 decennial census for residents age 16 and over. While comparing resident-only stops to the resident driving age population eliminates the influence out-of-town motorists has on the roads at any given time, the mere existence of a disparity is not in and of itself significant unless it does so by a significant amount. Such disparities may exist for several reasons including high police presence in high crime areas. A detailed explanation of the methodology can be found in Appendix A.4.

The resident only stop comparison analysis was confined to the 37 municipal police departments[13] in Rhode Island where decennial census information could be derived. The only traffic stops included in this analysis were stops where the driver was reported to be a resident of the town where they were stopped. For example, a resident of Providence stopped by Providence police would be included in the Providence analysis.

Overall, when compared to the census, 34 departments stopped more Minority resident motorists than their 16+ census population. Again, the disparity for many of these departments was very small. In the remaining three communities, the disparity was negative; meaning that more whites were stopped than expected based on the population numbers. However, the negative disparities were also very small in those communities. Almost all departments (33 of 37) had a disparity for Black motorists stopped and 28 departments had a disparity for Hispanic motorists 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. 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

[13] The New Shoreham Police Department did not report traffic stop information during this period.

(all race/ethnicity), (2) Black non-Hispanic, and (3) Hispanic. All department results are contained in the Table E.7, Table E.8, and Table 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)						
Providence	141,375	56.9%	9,238	86.8%	30.0%	1.53
Pawtucket	56,546	38.7%	4,273	60.0%	21.3%	1.55
North Smithfield	9,793	3.5%	263	22.8%	19.4%	6.59
Woonsocket	32,338	23.3%	2,859	41.2%	18.0%	1.77
North Providence	27,231	14.4%	1,616	27.2%	12.8%	1.89
Newport	21,066	18.1%	2,501	30.3%	12.2%	1.67
Central Falls	14,248	69.8%	1,584	81.2%	11.4%	1.16
East Providence	39,044	15.6%	3,215	26.9%	11.3%	1.72
Cranston	66,122	20.3%	9,220	31.4%	11.1%	1.55
Johnston	23,899	8.9%	1,068	19.3%	10.4%	2.16
Black (Non-Hispanic)						
Providence	141,375	12.4%	9,238	34.3%	21.9%	2.76
Pawtucket	56,546	11.1%	4,273	28.5%	17.4%	2.56
East Providence	39,044	5.2%	3,215	19.8%	14.6%	3.82
Newport	21,066	6.1%	2,501	18.2%	12.1%	2.97
North Providence	27,231	3.9%	1,616	14.2%	10.3%	3.65
Hispanic (All Racial Groups)						
Providence	141,375	33.5%	9,238	49.9%	16.3%	1.49
Woonsocket	32,338	10.7%	2,859	24.7%	14.1%	2.32
Pawtucket	56,546	17.4%	4,273	31.1%	13.7%	1.79
North Smithfield	9,793	1.8%	263	14.4%	12.6%	7.90

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
Black (Non-Hispanic)						
Woonsocket	32,338	4.9%	2,859	13.2%	8.3%	2.71
Middletown	12,812	4.2%	786	12.3%	8.1%	2.91
Central Falls	14,248	6.8%	1,584	14.1%	7.2%	2.06
North Smithfield	9,793	0.0%	263	7.2%	7.2%	N/A
Johnston	23,899	1.6%	1,068	7.2%	5.6%	4.37
Hispanic (All Racial Groups)						
Cranston	66,122	9.2%	9,220	17.0%	7.8%	1.85
North Providence	27,231	6.5%	1,616	12.1%	5.7%	1.88
Johnston	23,899	4.6%	1,068	9.6%	5.1%	2.12

V.D: SUMMARY OF 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 commuter driving population, and (3) resident-only stops that each cover three demographic categories: Black non-Hispanic, Hispanic, and Minority (all non-white). Department data is then measured against the resulting nine descriptive measures for evaluation purposes.

In order to weight 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 5, 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 six 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 the 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	
Providence	11.2%	10.40%		31.3%	18.9%	18.1%	30.0%	21.9%	16.3%	8
North Smithfield	28.7%		16.80%	28.0%	11.7%	17.6%	19.4%	7.2%	12.6%	7.5
North Providence	13.5%			17.7%	12.2%	8.6%	12.8%	10.3%	5.7%	6
Cranston	11.5%			18.5%	8.3%	12.6%	11.1%		7.8%	5
Pawtucket				12.7%	11.6%		21.3%	17.4%	13.7%	5
East Providence				12.2%	11.5%	5.9%	11.3%	14.6%		4.5

Note 1: M=Minority, B=Black, H=Hispanic (Numbers of 10 or above yield one point, numbers less than 10 equal 0.5 points)

VI. ANALYSIS OF STOP DISPOSITION, EQUALITY OF 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 Caucasian Non-Hispanic 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 bias to take. We implement the test by applying a multinomial logistic regression on the four possible stop outcomes and condition 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, time of day, day of week, week of year, and officer fixed-effects. In terms of possible outcomes, we regress indicators for warning (no search), arrest (no search), search, and where ticket/misdemeanor are 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, 2018

Table 6.1 presents the results of applying a multinomial logit to a sample of all traffic stops with four distinct stop outcomes regressed on race, stop basis, and their interaction. We present only 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. Across all specifications, we find strong evidence suggesting that minority motorists are treated differently than their Caucasian Non-Hispanic counterparts even when they are stopped for the same reason. In particular, we find that minority drivers are much more frequently given a warning and marginally less likely to be searched. The disparity is largest in magnitude for stops made on the basis of a license or registration problem as well as cellphone and seatbelt violations. A joint hypothesis test across all the interaction terms and all outcomes indicates that the difference in outcomes are highly significant at the 99 percent level for each demographic group relative to Caucasian Non-Hispanic motorists.

Table 6. 1: Multinomial Logistic Regression of Outcome on Minority Status and Reason for Stop, All Traffic Stops 2018

	Non-White		Black		Hispanic		Black or Hispanic	
	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE
No Search, Warning								
All Other	0.218***	(0.030)	0.203***	(0.032)	0.139***	(0.032)	0.176***	(0.026)
Equip.	0.212***	(0.038)	0.176***	(0.039)	0.263***	(0.040)	0.205***	(0.034)
SB or Cell	0.457***	(0.057)	0.466***	(0.058)	0.408***	(0.059)	0.475***	(0.048)
Reg. or Lic.	0.369***	(0.045)	0.347***	(0.047)	0.493***	(0.049)	0.391***	(0.040)
No Search, Arrest								
All Other	-0.067	(0.112)	-0.103	(0.115)	-0.259**	(0.113)	-0.211**	(0.096)
Equip.	0.082	(0.126)	0.004	(0.128)	-0.149	(0.128)	-0.143	(0.110)
SB or Cell	0.671***	(0.173)	0.641***	(0.175)	0.248	(0.177)	0.431***	(0.152)
Reg. or Lic.	0.332**	(0.131)	0.270**	(0.133)	0.009	(0.136)	0.091	(0.115)
Search								
All Other	-0.376***	(0.081)	-0.404***	(0.082)	-0.586***	(0.082)	-0.507***	(0.076)
Equip.	0.006	(0.093)	-0.062	(0.094)	-0.109	(0.095)	-0.123	(0.088)
SB or Cell	0.126	(0.158)	0.094	(0.159)	-0.077	(0.163)	0.002	(0.149)
Reg. or Lic.	-0.198*	(0.103)	-0.256**	(0.104)	-0.174*	(0.105)	-0.251***	(0.097)
Chi^2	206.41		185		228.58		264.05	
P-Value	0.000		0.000		0.000		0.000	
Sample Size	220,201		214,840		212,901		242,603	

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. Variables concatenated with a + in place of a *, were found to have a false discovery rate greater than 10 percent.
Note 2: All specifications include controls for gender, age, time of the day, day of the week, week of year, and officer 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 Caucasian Non-Hispanic 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 regardless of whether they are searched. As with the overall sample, stops for license or registration problems have the largest and most consistent disparity across all specifications followed by cellphone and seatbelt violations. A joint hypothesis test across all the interaction terms and all outcomes indicates that the difference in outcomes are statistically significant at the 99 percent level for each demographic group relative to Caucasian Non-Hispanic motorists.

Table 6. 2: Multinomial Logistic Regression of Outcome on Minority Status and Reason for Stop, Municipal Traffic Stops 2018

	Non-White		Black		Hispanic		Black or Hispanic	
	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE
No Search, Warning								
All Other	0.229***	(0.034)	0.223***	(0.036)	0.168***	(0.036)	0.195***	(0.030)
Equip.	0.232***	(0.044)	0.213***	(0.046)	0.282***	(0.046)	0.237***	(0.039)
SB or Cell	0.365***	(0.077)	0.368***	(0.080)	0.403***	(0.078)	0.413***	(0.066)
Reg. or Lic.	0.448***	(0.054)	0.441***	(0.056)	0.637***	(0.058)	0.512***	(0.048)
No Search, Arrest								
All Other	-0.024	(0.125)	-0.040	(0.128)	-0.171	(0.127)	-0.147	(0.108)
Equip.	0.033	(0.139)	-0.023	(0.143)	-0.087	(0.142)	-0.124	(0.122)
SB or Cell	0.781***	(0.218)	0.769***	(0.220)	0.361	(0.225)	0.535***	(0.193)
Reg. or Lic.	0.361**	(0.148)	0.319**	(0.152)	0.075	(0.157)	0.146	(0.131)
Search, Ticket or Misdemeanor								
All Other	-0.403***	(0.085)	-0.435***	(0.087)	-0.592***	(0.087)	-0.525***	(0.080)
Equip.	-0.022	(0.099)	-0.084	(0.099)	-0.111	(0.101)	-0.129	(0.093)
SB or Cell	0.247	(0.178)	0.198	(0.179)	0.075	(0.182)	0.130	(0.167)
Reg. or Lic.	-0.168	(0.110)	-0.230**	(0.111)	-0.111	(0.113)	-0.209**	(0.104)
Chi^2	176.49		164.05		231.08		240.87	
P-Value	0.000		0.000		0.000		0.000	
Sample Size	181,862		177,873		177,036		199,381	

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. Variables concatenated with a + in place of a *, were found to have a false discovery rate greater than 10 percent.
Note 2: All specifications include controls for gender, age, time of the day, day of the week, week of year, and officer 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 find much less evidence suggesting that minority motorists are treated differently than their Caucasian Non-Hispanic counterparts. For the sample of State Police stops, we do find statistically significant differences in the way that minority motorists are stopped but they are much less dramatic than in the sample of municipal stops. However, a joint hypothesis test across all the interaction terms and all outcomes indicates that the difference in outcomes are statistically significant at the 99 percent level.

Table 6. 3: Multinomial Logistic Regression of Outcome on Minority Status and Reason for Stop, State Police Traffic Stops 2018

	Non-White		Black		Hispanic		Black or Hispanic	
	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE
No Search, Warning								
All Other	-0.051	(0.067)	-0.097	(0.071)	-0.125	(0.078)	-0.122**	(0.060)
Equip.	0.038	(0.078)	-0.052	(0.082)	0.160*	(0.087)	0.037	(0.069)
SB or Cell	0.274***	(0.088)	0.250***	(0.092)	0.182*	(0.096)	0.206***	(0.077)
Reg. or Lic.	0.177*	(0.091)	0.118	(0.095)	0.150	(0.106)	0.114	(0.082)
No Search, Arrest								
All Other	-0.495*	(0.276)	-0.588**	(0.281)	-0.832***	(0.264)	-0.673***	(0.230)
Equip.	0.314	(0.318)	0.174	(0.322)	-0.401	(0.318)	-0.140	(0.277)
SB or Cell	0.396	(0.331)	0.318	(0.335)	-0.237	(0.325)	0.045	(0.285)
Reg. or Lic.	0.198	(0.300)	0.096	(0.304)	-0.315	(0.297)	-0.164	(0.258)
Search								
All Other	-0.626**	(0.293)	-0.541*	(0.309)	-0.866***	(0.301)	-0.732***	(0.263)
Equip.	0.162	(0.363)	0.085	(0.380)	-0.678*	(0.401)	-0.207	(0.337)
SB or Cell	-0.159	(0.430)	-0.084	(0.439)	-0.609	(0.443)	-0.376	(0.384)
Reg. or Lic.	-0.193	(0.341)	-0.130	(0.353)	-0.227	(0.347)	-0.162	(0.304)
Chi^2	41.96		38.56		38.62		43.56	
P-Value	0.000		0.000		0.000		0.000	
Sample Size	36,294		35,014		33,970		41,120	

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. Variables concatenated with a + in place of a *, were found to have a false discovery rate greater than 10 percent.
Note 2: All specifications include controls for gender, age, time of the day, day of the week, week of year, and officer 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 rate of minority traffic stops made by municipal police departments in Rhode Island, these results do not identify the geographic source of that disparity. The results of a department-level analysis are presented in the next section and better identify the source of specific department-wide disparities.

VI.B: DEPARTMENT ANALYSIS OF STOP DISPOSITION, 2018

The analysis presented at the state-level shows that minority motorists are treated differently, in terms of disposition, relative to their Caucasian Non-Hispanic 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 barracks. 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 time of day, day of 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 percent level in either of the Hispanic or Black alone minority groups. The full set of results are contained in Table F.1 of Appendix F.

Table 6.4 presents the results from estimating the test of equality in stop dispositions for minority motorists relative to their Caucasian Non-Hispanic peers. As before, our test statistic is generated from a joint hypothesis test on the interaction between race and the basis for a traffic stop across all possible outcomes. For parsimony, we omit the coefficient estimates on these interaction terms and present only the chi-squared and level of significance for the joint hypothesis test. As shown below, we find that 20 of the total 44 municipal departments and four State Police barracks were found to have a statistically significant disparity in the distribution of stop outcomes for minority motorists. Although it does appear that minority motorists are treated differently in several of the departments identified in other tests, we still caution the reader from drawing any conclusions based on these results. As noted before, our ideal analysis would include data on every reason that a stop was made and all requisite outcomes.

Table 6. 4: Multinomial Logistic Regression of Outcome on Minority Status and Reason for Stop by Department, All Traffic Stops 2018

Department	Variable	Non-White	Black	Hispanic	Black or Hispanic
Bristol	Chi^2	1,376.536***	2,174.905***	N/A	1,259.943***
	P-Value	0.001	0.001	N/A	0.001
	Observations	4638	4581	4513	4700
	Pseudo R2	0.171	0.171	0.167	0.173
Burrillville	Chi^2	2,442.719***	9,951.487***	1,796.802***	960.257***
	P-Value	0.001	0.001	0.001	0.001
	Observations	4369	4349	4354	4486
	Pseudo R2	0.252	0.252	0.252	0.252
Coventry	Chi^2	1,717.449***	98.765***	N/A	1,921.151***
	P-Value	0.001	0.001	N/A	0.001
	Observations	6884	6830	6794	7020
	Pseudo R2	0.112	0.112	0.111	0.112
Cranston	Chi^2	25.521**	22.034**	754.453***	23.472**
	P-Value	0.013	0.037	0.001	0.024
	Observations	23416	22345	23447	27416
	Pseudo R2	0.18	0.181	0.18	0.172
Cumberland	Chi^2	2,225.802***	2,281.055***	N/A	N/A
	P-Value	0.001	0.001	N/A	N/A
	Observations	4299	4212	4424	4768
	Pseudo R2	0.151	0.153	0.145	0.145
East Greenwich	Chi^2	N/A	171.438***	N/A	N/A
	P-Value	N/A	0.001	N/A	N/A
	Observations	928	910	901	936
	Pseudo R2	0.246	0.256	0.25	0.261
East Providence	Chi^2	16.764	14.47	21.059**	25.975**
	P-Value	0.158	0.272	0.05	0.01
	Observations	11708	11512	10174	12558
	Pseudo R2	0.181	0.181	0.186	0.173
Foster	Chi^2	278.694***	N/A	3,604.252***	43,017.140***
	P-Value	0.001	N/A	0.001	0.001
	Observations	796	762	762	818
	Pseudo R2	0.331	0.345	0.361	0.356

Department	Variable	Non-White	Black	Hispanic	Black or Hispanic
Glocester	Chi^2	1,614.015***	N/A	2,888.009***	24.375***
	P-Value	0.001	N/A	0.001	0.001
	Observations	2287	2265	2230	2314
	Pseudo R2	0.177	0.179	0.172	0.172
Hopkinton	Chi^2	9,920.260***	9,386.206***	N/A	N/A
	P-Value	0.001	0.001	N/A	N/A
	Observations	2116	2041	1983	2167
	Pseudo R2	0.188	0.194	0.19	0.189
Jamestown	Chi^2	3,320.860***	2,115.090***	N/A	3,066.691***
	P-Value	0.001	0.001	N/A	0.001
	Observations	1604	1568	1549	1619
	Pseudo R2	0.243	0.247	0.246	0.243
Middletown	Chi^2	1,243.668***	1,843.598***	N/A	N/A
	P-Value	0.001	0.001	N/A	N/A
	Observations	4006	3931	3694	4201
	Pseudo R2	0.152	0.151	0.156	0.146
North Kingstown	Chi^2	3,118.239***	2,686.318***	12.295	705.111***
	P-Value	0.001	0.001	0.137	0.001
	Observations	4060	3988	3900	4184
	Pseudo R2	0.18	0.18	0.185	0.179
North Smithfield	Chi^2	877.307***	1,018.135***	N/A	573.908***
	P-Value	0.001	0.001	N/A	0.001
	Observations	2925	2869	2859	3190
	Pseudo R2	0.218	0.221	0.215	0.208
Pawtucket	Chi^2	33.631***	35.061***	28.148***	25.729**
	P-Value	0.001	0.001	0.004	0.012
	Observations	8480	8371	7919	10413
	Pseudo R2	0.252	0.252	0.261	0.254
Portsmouth	Chi^2	N/A	1,278.161***	1,606.862***	55.737***
	P-Value	N/A	0.001	0.001	0.001
	Observations	6423	6303	6036	6697
	Pseudo R2	0.143	0.143	0.149	0.143
RISP - Hope Valley	Chi^2	95.775***	71.498***	930.081***	78.755***
	P-Value	0.001	0.001	0.001	0.001
	Observations	7480	7032	6743	8124
	Pseudo R2	0.128	0.128	0.13	0.123
RISP - HQ	Chi^2	N/A	1,260.651***	N/A	601.205***
	P-Value	N/A	0.001	N/A	0.001
	Observations	2012	1978	1927	2242
	Pseudo R2	0.256	0.259	0.284	0.275
RISP - Lincoln	Chi^2	35.429***	34.782***	19.479*	32.289***
	P-Value	0.001	0.001	0.078	0.001
	Observations	10175	9847	9665	12192
	Pseudo R2	0.104	0.104	0.112	0.098
RISP - Scituate	Chi^2	56.692***	47.143***	2,204.506***	N/A
	P-Value	0.001	0.001	0.001	N/A
	Observations	5612	5444	5409	6563
	Pseudo R2	0.122	0.125	0.131	0.123

Department	Variable	Non-White	Black	Hispanic	Black or Hispanic
South Kingstown	Chi^2	692.101***	1,338.546***	1,533.586***	596.695***
	P-Value	0.001	0.001	0.001	0.001
	Observations	5786	5620	5416	5790
	Pseudo R2	0.158	0.159	0.165	0.158
Warwick	Chi^2	320.378***	341.798***	281.070***	327.311***
	P-Value	0.001	0.001	0.001	0.001
	Observations	13636	13361	13194	14481
	Pseudo R2	0.141	0.142	0.14	0.136
Westerly	Chi^2	1,106.860***	1,121.709***	1,448.083***	1,110.313***
	P-Value	0.001	0.001	0.001	0.001
	Observations	4742	4644	4566	4760
	Pseudo R2	0.149	0.149	0.144	0.144
Woonsocket	Chi^2	671.784***	552.245***	123.794***	78.597***
	P-Value	0.001	0.001	0.001	0.001
	Observations	4849	4654	4987	5740
	Pseudo R2	0.157	0.158	0.155	0.148

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. Variables concatenated with a + in place of a *, were found to have a false discovery rate greater than 10 percent.
Note 2: All specifications include controls for gender, age, time of the day, day of the week, week of year, and officer 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).

VII. ANALYSIS OF VEHICULAR SEARCHES, KPT HIT-RATE

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 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. [14]

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 more 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. We limit our analysis to discretionary searches which are defined as those characterized as consent or probable cause since inventory searches are likely correlated with other offenses as well as race.

VII.A: AGGEGATE ANALYSIS WITH HIT-RATES, 2018

The analysis begins by aggregating all search data for Rhode Island by demography and performing the non-parametric test of hit-rates. The rate that discretionary searches end in contraband being found for Caucasian Non-Hispanic motorists is compared to each minority subgroup. The results of this test, applied to the aggregate search data for all departments in Rhode Island, can be seen in Table 7.1. As seen below, the rate of successful searches for Caucasian Non-Hispanic motorists was 54.5 percent in 2018. Relative to Caucasian Non-Hispanic motorists, the hit-rate for each of the four minority subgroups was lower and ranged from 47.5 to 47.9 percent. The difference in hit-rates for each group was statistically significant at the 99 percent level. In aggregate, Rhode Island police departments are less successful in motorist searches across all minority groups, which is a potential indicator of disparate treatment.

[14] 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 Rhode Island.

Table 7. 1: Chi-Square Test of Hit-Rate, All Discretionary Searches 2018

Variable	Caucasian	Non-Caucasian	Black	Hispanic	Black or Hispanic
Hit Rate	54.474%	47.458%***	47.576%***	47.988%***	46.991%***
Contraband	1047	1905	1874	1754	2358
Searches	1922	4014	3939	3655	5018
Chi2	N/A	25.587	24.591	21.193	31.142
P-Value	N/A	0.001	0.001	0.001	0.001

Note 1: 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.
Note 2: Sample includes all discretionary searches in 2018.

Table 7.2 provides the results of a hit-rate analysis for discretionary searches made in aggregate by municipal departments in 2018. The hit-rate in municipal departments for Caucasian Non-Hispanic motorists was 53.9 percent. Relative to Caucasian Non-Hispanic motorists, the hit-rate for each of the four minority subgroups was lower and ranged from 47.2 to 47.7 percent. Each of these differences were also statistically significant at the 99 percent level. Our interpretation of these coefficient estimates is that municipal departments in Rhode Island may be disproportionately searching minority motorists relative to their Caucasian counterparts.

Table 7. 2: Chi-Square Test of Hit-Rate, Municipal Police Discretionary Searches 2018

Variable	Caucasian	Non-Caucasian	Black	Hispanic	Black or Hispanic
Hit Rate	53.944%	47.244%***	47.368%***	47.708%***	46.662%***
Contraband	930	1835	1809	1697	2258
Searches	1724	3884	3819	3557	4839
Chi2	N/A	21.438	20.548	18.059	26.982
P-Value	N/A	0.001	0.001	0.001	0.001

Note 1: 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.
Note 2: Sample includes all discretionary searches made by municipal departments in 2018.

Table 7.3 provides the results of a hit-rate analysis for discretionary searches made in aggregate by State Police in 2018. The aggregate hit-rate for all State Police was 58.8 percent for Caucasian Non-Hispanic motorist. Relative to Caucasian Non-Hispanic motorists, the hit-rate for each of the four minority subgroups was lower but the overall sample was not very large and these differences were not found to be statistically significant. Thus, we conclude that State Police appear to be searching minority motorists at about the same rate as Caucasian Non-Hispanic peers relative to differences in each groups propensity to carry contraband.

Table 7. 3: Chi-Square Test of Hit-Rate, State Police Discretionary Searches 2018

Variable	Caucasian	Non-Caucasian	Black	Hispanic	Black or Hispanic
Hit Rate	58.75%	52.727%	52.474%	58.242%	55.4%
Contraband	94	58	53	53	87
Searches	160	110	101	91	157
Chi2	N/A	0.961	0.99	0.006	0.36
P-Value	N/A	0.326	0.319	0.936	0.549

Note 1: 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.
Note 2: Sample includes all discretionary searches made by State Police in 2018.

VII.B: DEPARTMENT ANALYSIS WITH HIT-RATES, 2018

In this subsection, differences in hit-rates are estimated independently for each municipal department and State Police barracks. Here, we identify and present results for the only two departments found to have a disparity that is statistically significant at the 95 percent level. However, these results did not survive our threshold of a less than 10 percent on the false discovery rate test. The full set of results can be found in Table F.1 of Appendix F. Although we lack the ability to draw definitive conclusions from these results, we note that the small sample of overall searches in most departments reduces overall statistical power and the sample of p-values used to estimate the envelope for the false discovery rate.

Table 7. 4: Chi-Square Test of Hit-Rate, Select Department Discretionary Searches 2018

Department	Variable	Caucasian	Non-Caucasian	Black	Hispanic	Black or Hispanic
North Providence +	Hit Rate	N/A	56.409%++	55.263%++	N/A	52.500%+
	Contraband	N/A	22	21	N/A	21
	Searches	N/A	39	38	N/A	40
	Chi2	N/A	4.222	3.944	N/A	3.401
	P-Value	N/A	0.039	0.046	N/A	0.064
	Q-Value	N/A	0.647	0.647	N/A	0.695
RISP-Lincoln +	Hit Rate	75%	48.570%++	48.570%++	N/A	60.416%
	Contraband	27	17	17	N/A	29
	Searches	36	35	35	N/A	48
	Chi2	N/A	5.260	5.260	N/A	1.968
	P-Value	N/A	0.021	0.021	N/A	0.160
	Q-Value	N/A	0.600	0.600	N/A	0.695

Note 1: 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. Variables concatenated with a + in place of a *, were found to have a false discovery rate greater than 10 percent.
Note 2: Sample includes all discretionary searches made by municipal departments and State Police in 2018.
Note 3: The test was only estimated when the combined sample of Caucasian and minority motorists exceeded 30 searches.
Note 4: 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).

VIII: FINDINGS FROM THE 2018 ANALYSIS

This section represents a summary of the findings from the analysis of traffic stops conducted between January 1, 2018 and December 31, 2018.

VIII.A: AGGREGATE FINDINGS FOR RHODE ISLAND, 2018

Across Rhode Island's municipal departments and State Police barracks, a total of 15.8 percent of motorists stopped during the analysis period were observed to be Black while 14.9 percent of stops were Hispanic motorists. The results from the Solar Visibility Analysis indicate that stopped motorists were more likely to be minorities during daylight relative to darkness suggesting the existing of a racial or ethnic disparity in terms of the treatment of minority motorists relative to Caucasian motorists. The statewide results from the Solar Visibility Analysis were found to be robust to the addition of a variety of controls. The level of statistical significance remained relatively consistent in sign when the sample is reduced to only moving violations but become somewhat noisier when officer fixed-effects are included. The results from the post-stop analysis confirm that the statewide disparity carries through to post-stop behavior across all racial and ethnic groups. In aggregate, Rhode Island police departments exhibit a tendency to be less successful in motorist searches across all minority groups but most of this effect is concentrated in the subsample of stops made by municipal police.

It is important to note that it is impossible to clearly link any of these observed disparities to racial profiling as they may be driven by any combination of policing policy, heterogeneous enforcement patterns, or individual officer behavior.

VIII.B: SOLAR VISIBILITY ANALYSIS FINDINGS, 2018

In an effort to better identify the source of these racial and ethnic disparities, each analysis was repeated at the department level. Although there is evidence of a disparity at the state level, it is important to note that specific departments are likely driving these statewide trends. 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.[15] 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 barracks where disparities could be a function of a number of factors including institutional culture, departmental policy, or individual officers.[16]

There was a total of four municipal departments identified to exhibit a statistically significant increase in the odds that a minority motorist is stopped during daylight. These departments include:

[15] 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.

[16] 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.

Bristol

The Bristol municipal police department was observed to have made 8.0 percent minority stops in 2018 of which 3.9 percent were Black and 2.9 percent were Hispanic. During the inter-twilight window, 2.5 percent of stops were Black and 2.3 percent were of Hispanic motorists. The Solar Visibility Analysis indicated a statistically significant disparity in the rate that both Black and Hispanic motorists were stopped during daylight relative to darkness. However, only the result for Hispanic motorists withstood our threshold of a ten percent false discovery rate. Within the inter-twilight window, the odds that a stopped motorist was Black and Hispanic motorists increased by 2.1 and 4.1 respectively during daylight. The results for Hispanic motorists were statistically significant at a level greater than 99 percent and robust to the inclusion of a variety of controls including officer fixed-effects as well as to a restricted subsample of moving violations.

Smithfield

The Smithfield municipal police department was observed to have made 15.9 percent minority stops in 2018 of which 6.7 percent were Black and 7.7 percent were Hispanic. During the inter-twilight window, 5.5 percent of stops were Black and 5.6 percent were of Hispanic motorists. The Solar Visibility Analysis indicated a statistically significant disparity in the rate that both Black motorists were stopped during daylight relative to darkness. Within the inter-twilight window, the odds that a stopped motorist was Black motorists increased by 2.1 during daylight. The results for Black motorists were statistically significant at a level greater than 99 percent and robust to the inclusion of a variety of controls including officer fixed-effects as well as to a restricted subsample of moving violations.

Warwick

The Warwick municipal police department was observed to have made 20.3 percent minority stops in 2018 of which 9.1 percent were Black and 9.4 percent were Hispanic. During the inter-twilight window, 14 percent of stops were Black and 14 percent were of Hispanic motorists. The Solar Visibility Analysis indicated a statistically significant disparity in the rate that both Black and Hispanic motorists were stopped during daylight relative to darkness. Within the inter-twilight window, the odds that a stopped motorist was Black and Hispanic motorists increased by 1.9 and 1.8 respectively during daylight. These results were statistically significant at a level greater than 99 percent and robust to the inclusion of a variety of controls including officer fixed-effects as well as to a restricted subsample of moving violations.

Westerly

The Westerly municipal police department was observed to have made 10.9 percent minority stops in 2018 of which 5.0 percent were Black and 3.4 percent were Hispanic. During the inter-twilight window, 5.2 percent of stops were Black and 3.1 were of Hispanic motorists. The Solar Visibility Analysis indicated a statistically significant disparity in the rate that Hispanic motorists were stopped during daylight relative to darkness. Within the inter-twilight window, the odds that a stopped motorist was Hispanic motorists increased by 2.1 during daylight. The results for Hispanic motorists were statistically significant at a level greater than 99 percent and robust to the inclusion of a variety of controls including officer fixed-effects as well as to a restricted subsample of moving violations.

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

In addition to the four municipal police departments identified to exhibit statistically significant racial or ethnic disparities in the Solar Visibility analysis, 20 other municipal police departments and four State Police barracks were identified using a combination of the synthetic control method, 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.

VIII.C. (1): Synthetic Control Analysis:

The results from estimating whether individual departments stopped more minority motorists relative to their requisite synthetic control found seven municipal police departments to have a disparity that was statistically significant at the 95 percent level in the Black or Hispanic alone categories. However, the disparities did not persist in all of these departments through robustness checks with a more restrictive modeling specification. In total, there were only five municipal police departments that withstood this more rigorous estimation procedure. Those departments are *Cumberland, Hopkinton, Lincoln, Middletown, and North Smithfield.*

VIII.C. (2): 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 20 municipal police departments were identified with racial and ethnic disparities when compared to one or more of the descriptive measures, only *Providence*, *North Smithfield, North Providence, Cranston, Pawtucket*, and *East Providence* exceeded the disparity threshold in more than half the benchmark areas.

VIII.C. (3): Stop Disposition Analysis:

In aggregate, minority motorists stopped by municipal police departments were found to have a statistically different distribution of outcomes conditional on the basis for which they were stopped. In the departmental analysis, there were 20 of 44 municipal departments and four State Police barracks were found to have a disparity in the distribution of outcomes. These differences were statistically significant at the 95 percent level or above in the Black or Hispanic alone categories. However, we note that the number of violations might be corelated with more severe outcomes and race. Since this variable is unobservable in the current data, we strongly caution the reader about drawing any conclusions from this section alone. The departments identified in this test include: *Bristol, Burrillville, Coventry, Cranston, Cumberland, East Greenwich, East Providence, Foster, Glocester, Hopkinton, Jamestown, Middletown, North Kingston, North Smithfield, Pawtucket, Portsmouth, South Kingstown, Warwick, Westerly, Woonsocket, RISP - Hope Valley, RISP- HQ, RISP- Lincoln, and RISP- Scituate.*

VIII.C. (4): KPT Hit-Rate Analysis:

The results of the KPT Hit-Rate test, applied to the aggregate search data for all departments in Rhode Island show that departments are less successful in motorist searches across all minority groups, which is a potential indicator of disparate treatment. The *North Providence* municipal police department and *Lincoln State Police barracks* was found to have a disparity in the hit-rate of Black motorists relative to Caucasian Non-Hispanic motorists, which was statistically significant at the 95 percent level. However, the sample size did not warrant an analysis of the Black or Hispanic alone category and the analysis did not withstand the threshold of a 10 percent false discovery rate for either jurisdiction. Thus, we were unable to rule out the possibility that these departments were identified by chance.

VIII.D: FOLLOW-UP ANALYSIS

The entirety of Part I 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 the five analytical sections of the report (Veil of Darkness, Synthetic Control, Descriptive Statistics, Stop Disposition and KPT Hit-Rate). 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:

4. A statistically significant disparity in the solar visibility analysis
5. A statistically significant disparity in the synthetic control analyses and any one of the following analyses:
    a. Descriptive statistics
    b. KPT-hit rate
6. A statistically significant disparity in the descriptive statistics, stop disposition, and KPT hit-rate analyses.

Based on the above listed criteria it was recommended that an in-depth follow-up analysis should be conducted for the following departments: **(1) Bristol, (2) Smithfield, (3) Warwick, and (4) Westerly.** None of these four municipal departments have been identified in previous reports.

North Smithfield was also identified with racial and ethnic disparities in this study as well as in both the 2016 and 2017 Traffic Stop Data Analysis and Findings reports. An in-depth follow-up analysis, with recommendations, was previously completed for the department. The racial and ethnic disparities have remained consistent in each of the annual studies. Based on the results of the previously published follow-up analyses and our further understanding of traffic stop enforcement in North Smithfield, 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 report. The department should

continue to review and monitor traffic enforcement policies to evaluate the disproportionate effect they could be having on minority drivers. They should also continue to take steps to assure that their minority community is fully engaged in the process of understanding why the allocation of enforcement resources are made and what outcomes are being achieved.

Although further analysis is important, a major objective of any review of possible racial profiling in Rhode Island 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 are an important tool used 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 their community.

PART II: 2018 FOLLOW-UP ANALYSIS

IX: FOLLOW-UP ANALYSIS INTRODUCTION

The information presented in the subsequent sections consists of four follow-up reports, one conducted for each department that warranted further analysis (Bristol, Smithfield, Warwick, and Westerly). 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 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. 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 wanted to better understand where traffic enforcement occurs in a community. The best way to complete this task is to review reported traffic stop location information for each identified community. Police officers report the location of a traffic stop in a variety of ways. In some cases, the officer reported a descriptive location such as the number and street or street and nearest cross street. In other cases, the officer reported the patrol district where the stop occurred. The project staff worked with each of the four municipal police departments to identify the stop location data and the best format it was available in.

Bristol, Warwick and Westerly officers recorded the location of a traffic stop by patrol area. Bristol is divided into 22 patrol posts, Warwick is divided into 17 patrol posts, and Westerly is divided into five patrol posts. Although we were unable to determine the specific street location of each stop in these departments, the patrol areas provide us with enough information to assess how neighborhoods change within each jurisdiction. The fourth department, Smithfield, provided detailed location descriptions that allowed researchers to identify the corridor where the stop was conducted. This allowed us to conduct a descriptive analysis of major corridors and roadways.

Researchers have the ability to better understand the demographics of a subsection of a community by breaking down traffic stops into neighborhoods, corridors, or patrol zones. This detailed location analysis not only provides a better understanding of population demographics, but also allows researchers to focus on the unique attributes of a subsection of a community such as major traffic generators, accident rates, local crime problems, and calls for service. Neighborhoods can vary greatly within a community and a more detailed analysis helps to better understand the information presented in the initial analysis.

Although analyzing traffic stops by census tract is the preferred method, analyzing traffic stops by patrol area or corridor is also an effective approach. Presented below are our findings from the department level descriptive analysis for each of the four identified departments.

X: BRISTOL 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 researchers conduct an in-depth analysis for the Bristol Police Department.

According to the results from the "Solar Visibility" analysis, the Bristol Police Department indicated a statistically significant disparity in the rate that both black and Hispanic motorists were stopped during daylight relative to darkness. However, only the result for Hispanic motorists withstood our threshold of a ten percent false discovery rate. Within the inter-twilight window, the odds that a stopped motorist was black or Hispanic increased by 2.1 and 4.1 respectively during daylight relative to darkness. The results for Hispanic motorists were statistically significant at a level greater than 99 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 2018 calendar year, the Bristol Police Department made 4,761 traffic stops. Of these, 8% were minority stops (3% Hispanic and 4% black). Table 10.1 below compares summary racial data for reported traffic stops in Bristol over a three-year period.

Table 10. 1: Bristol Traffic Stops – 2016 - 2018

	2016 Stops		2017 Stops		2018 Stops	
White	5,354	92.3%	6,272	92.0%	4,379	92.0%
Black	213	3.7%	260	3.8%	187	3.9%
Asian	57	1.0%	65	1.0%	54	1.1%
NA*	2	0.1%	4	0.1%	3	0.1%
Hispanic	175	3.0%	216	3.2%	138	2.9%
Total	**5,801**		**6,817**		**4,761**	

*Native American

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

Researchers studied the racial and ethnic disparities in the Bristol Police Department data using a more detailed review of traffic enforcement during the study period. Part of the analysis involved reviewing the detailed location descriptions provided by the department and any enhancement we were able to make to the records provided. Bristol officers record the location of a traffic stop by patrol posts. The town is divided into 22 patrol posts. Although we are unable to determine the specific street location of each stop, the patrol posts provided enough geographical differentiation to assess differences within areas of the town.

According to the 2010 census, Bristol is a town with approximately 19,740 residents over the age of 16. Approximately 4% of the driving age population in Bristol is identified as a minority. Table 10.2 outlines the basic demographic information for Bristol residents over age 16.

Table 10. 2: Bristol Population

Race/Ethnicity	16+ Population Total	% Population Total
White Non-Hispanic	18,910	95.8%
Black Non-Hispanic	144	0.7%
AsPac Non-Hispanic	154	0.8%
Hispanic	345	1.7%
Other	187	0.9%
Total	**19,740**	

Bristol is approximately 20.6 square miles in area, of which 10.1 square miles is land and 10.5 square miles is water. The town is one of three towns that make up Bristol County with both Warren and Barrington located to its north. Bristol is a peninsula with Narragansett Bay on its west and Mount Hope Bay on its east. Bristol harbor is home to over 800 boat moorings. Two other municipalities in Rhode Island border Bristol. Bristol is bordered by Warren to its north and Portsmouth to its south. Warren shares a land border with Bristol while its connection to Portsmouth is via the Mount Hope Bridge into Middletown and Newport. The two bordering towns of Warren and Portsmouth are predominately white demographically, with an average white driving age population similar to Bristol's (96%) Portsmouth's non-white driving age population (1.7% Hispanic, 1.3% black, 1.6% Asian/Pacific Islander, and 1.0% other races) is slightly more diverse than either Warren's or Bristol's.

Of the drivers stopped in Bristol, 41% were town residents while 59% lived somewhere other than Bristol. Bristol's proportion of non-resident drivers stopped was the sixth lowest of any town in Rhode Island. Thus, while all Rhode Island towns are affected by non-resident drivers to one extent or another, non-residents had less influence on the Bristol data than in most other Rhode Island communities.

Route 114 is the main thoroughfare through the town. The roadway is locally known as Hope Street from the border of Warren south to the intersection of Wood Street where it becomes Ferry Road. Ferry Road eventually turns into the Mount Hope Bridge, which connects Bristol to Portsmouth, Middletown, and, eventually, Newport. Route 114 is a 46-mile roadway that runs from the city of Woonsocket at Rhode Island's northern border south to Newport. It is considered a major north-south artery in northern Rhode Island. Approximately 5 miles of Route 114 runs through the town of Bristol.

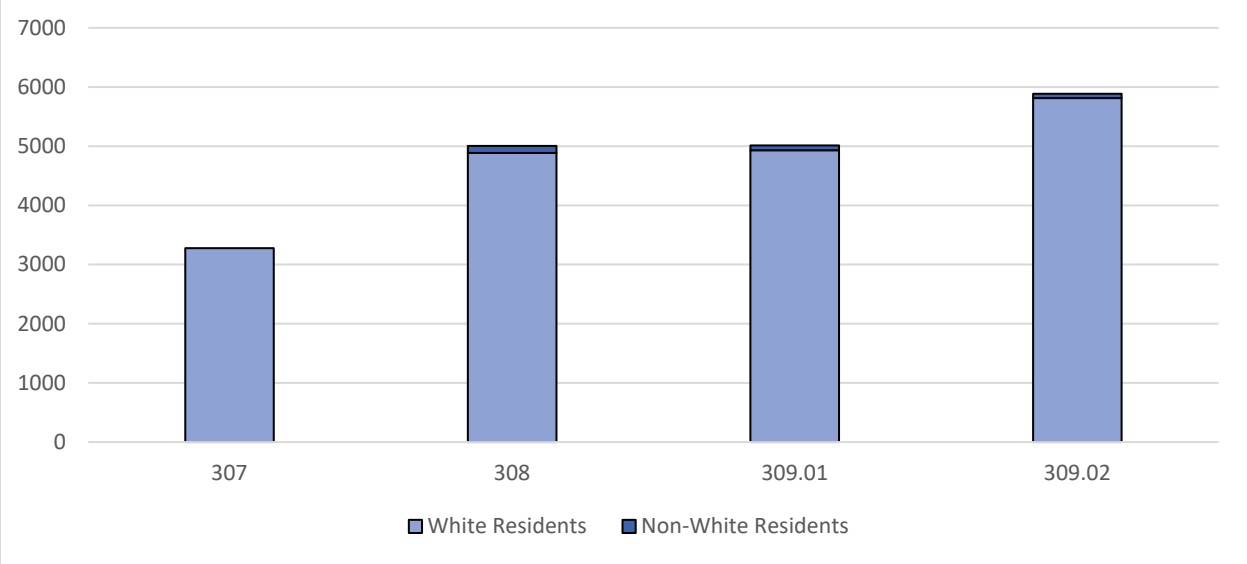
Bristol hosts Roger Williams University, a private four-year college with approximately 4,000 undergraduate students and 800 graduate students. Roger Williams is located on 140 acres of waterfront property in the south east part of town. The campus overlooks Mount Hope Bay. The university is one of the town's largest employers with just under 500 academic staff members and other support staff employees. It is also worth noting that Roger Williams University requires all freshman and sophomore students to live on campus.

Traffic enforcement is primarily the responsibility of the Patrol Division. There are 22 officers assigned to the Patrol Division. These 22 officers are assigned to three or four patrol beats depending on staffing availability and time of year. According to the department, the minimum staffing for any given shift is

three officers and one supervisor. Additional supervisors may be working during the week on various shifts. The maximum number of officers assigned is five on patrol with two supervisors. There is a minimum of three patrol beats, but four beats are possible if adequate staffing is available. Typically, one officer is assigned to each patrol beat, except in the summer months where two additional officers are assigned on foot or bicycle in the downtown area of Bristol to handle additional seasonal activity.

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 town, as evidenced in census tract data. The U.S. Census Bureau divides Bristol into four census tracts. The resident driving age population in each census tract varies from about 3,300 to 5,900 people, with the largest concentration (31% of the total population) in tract 309.02. Census tract 309.02 covers the western portion of the town and includes the northern part of Route 114. This census tract also covers Colt State Park, which is 464 acres and the western border of the park is on Narragansett Bay. Figure 10.1 shows the distribution for each census tract in terms of white and non-white driving age populations.

Figure 10. 1: Age 16 and Older Resident Population by Census Tract

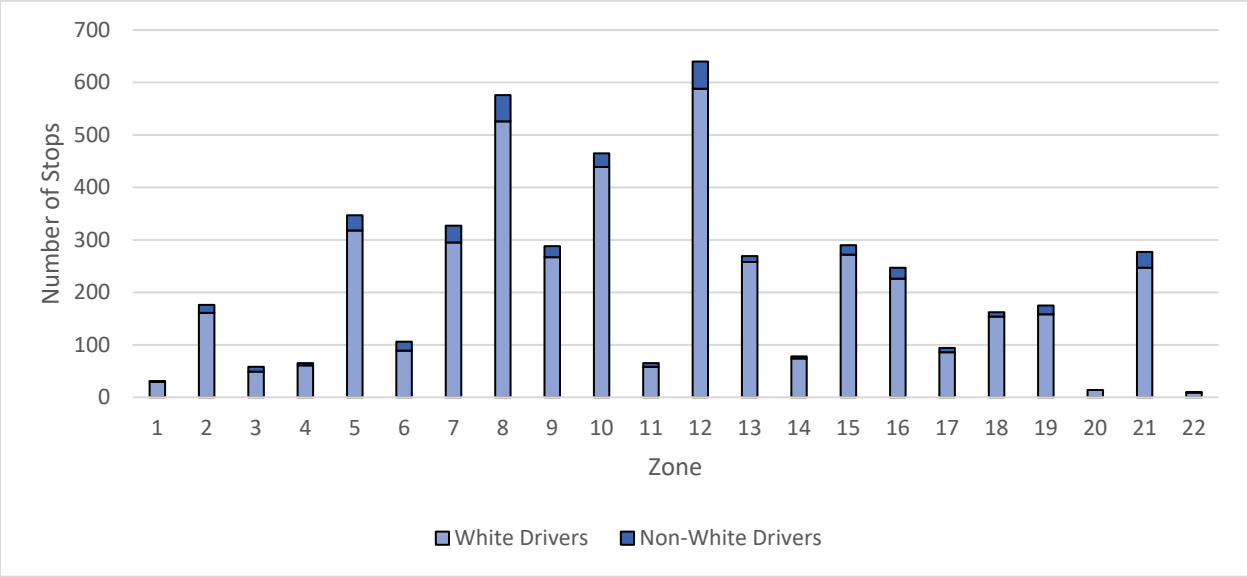


The records management system used by the Bristol Police Department captures the location of traffic stops in one of 24 zones that divide the town. However, traffic stops were only reported in 22 zones. Zone 23 and 24 had no traffic stops reported and are not included in our analysis. Zone 23 is primarily Colt State Park and zone 24 is the Bristol Police Department itself. The Rhode Island State Police and Department of Environmental Management are primarily responsible for patrol activity and responding to calls for service in Colt State Park. From Memorial Day through Labor Day the State Police assign officers to the area on the weekends. Although there are 24 zones where a stop can be identified a Bristol Police officer is responsible for patrolling several zones during a shift. Generally speaking, the zone matrix involves a sequentially numbered three-zone-wide pattern with zone numbers increasing from lowest to highest as you move from north to south in the town.

Figure 10.2 illustrates the volume of traffic enforcement that occurs in each of the 22 zones. Traffic enforcement appears to be more highly concentrated in the zones in the center of the town, especially in the zones that include Route 114. More specifically, the four zones that include the largest portion of

Route 114 (zones 5, 8, 10, and 12) accounted for 43% of all stops in the town. Zones 8 and 12 combined for 25% of all the Bristol stops. In these four zones the stop demographics included 8% minority drivers and 92% white drivers, but these stops accounted for 41% of all the minority drivers stopped in Bristol. According to the department, traffic enforcement is directed to the downtown area because it is densely populated with restaurants, bars, and other town-wide attractions. The downtown area also has many pedestrian crosswalks and more enforcement is needed in the area for pedestrian safety.

Figure 10. 2: Traffic Stops by Patrol Zone



X.B: Traffic Stop Breakdown by Race/Ethnicity

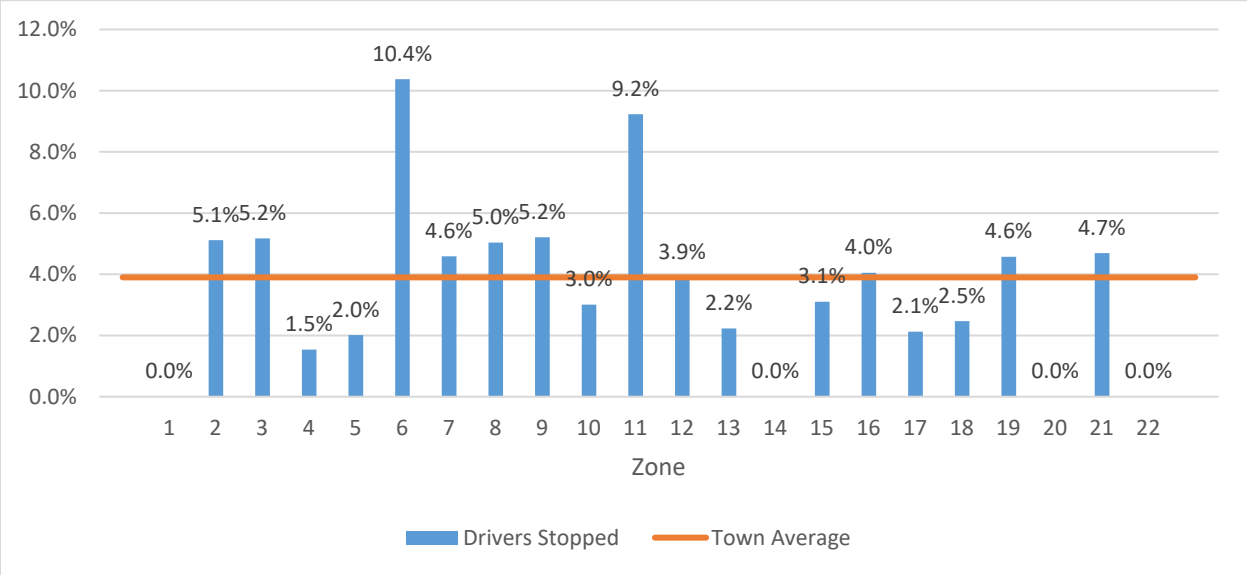
In Bristol, 8% of all drivers stopped were minority drivers, classified as all non-white drivers, but predominantly black or Hispanic drivers. Bristol's resident population age 16 and older is 4% minority. Although the difference between the two suggests a disparity in the proportion of minority drivers stopped during the study period, variations in the racial and ethnic makeup of different areas of Bristol and the influence of out-of-town drivers in the areas of the highest enforcement has an effect on those stop demographics.

The overall percentage of Bristol traffic stops involving black drivers was 4%. The town average of 4% of black drivers stopped was exceeded in nine of the 22 patrol zones, but most significantly in zones 6 and 11. While the percentage of drivers stopped in these two zones who were black was more than twice as large as the average for the town as a whole, it should be noted these zones accounted for only 3.6% of the town's total stops. Zone 6 is on the east side of town along Metacom Avenue between Michael Drive and Narrows Road. Zone 11 is also on the east side of town along Metacom Avenue between Annawamscutt Drive and Hopeworth Avenue.

Of the other seven zones, zones 2 and 3 border the town of Warren, zones 7, 8, and 9 form a band across the center of the town, and zones 19 and 21 are located in the southern part of town near Roger Williams University. Zones 2 and 3 account for 4.9% of the town's stops, zones 7, 8, and 9 for 25%, and zones 19 and 21 for 9.5% of the stops. As a group, these nine zones accounted for 43% of the town's stops but 58% of all the black drivers stopped in Bristol. It is worth noting that 82% of all black drivers stopped in Bristol

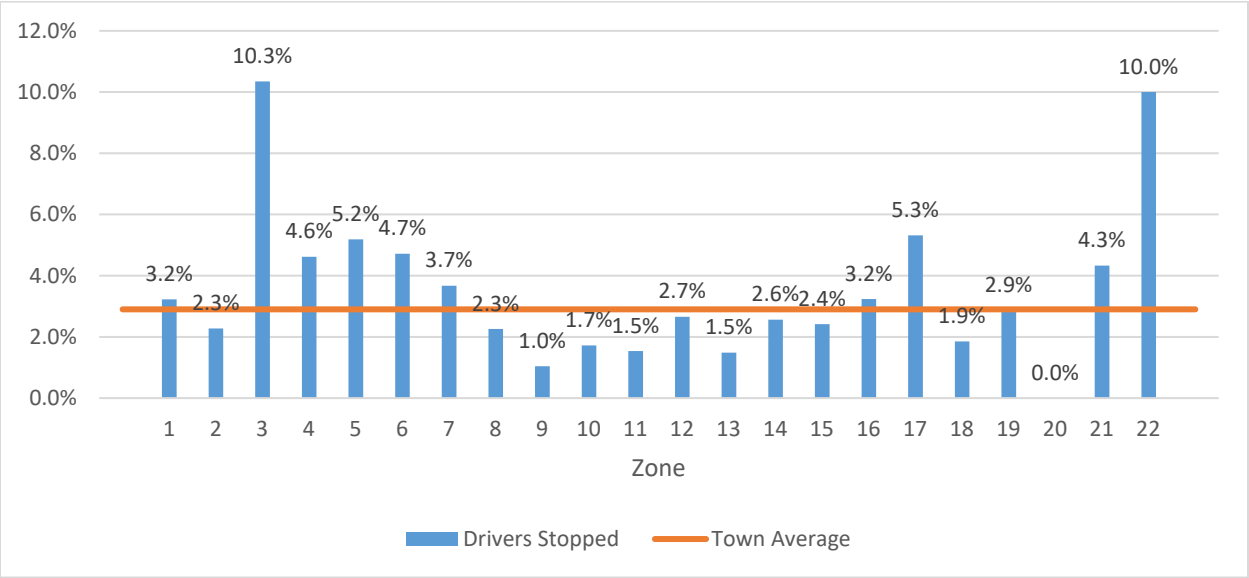
were not residents of the town. Figure 10.3 shows the difference between the black drivers stopped by zone and the town average.

Figure 10. 3: Black Drivers Stopped Compared to Town Average



The overall percentage of Bristol traffic stops involving Hispanic drivers was 3%. The percentage of resident driving age Hispanics in Bristol was 1.7%. The percentage of Hispanic drivers stopped exceeded the town average of 3% in eight of the 22 zones in town. Of the eight zones that exceed the town average, zones 3, 4, 5, 6, and 7 are located in the northern part of town, zone 17 is located east of Metacom Ave between Tower Street and Church Cove Road, zone 21 is west of Ferry Road from the Mount Hope Bridge to Wood Street, and zone 22 everything south of Colt Drive. These eight zones account for 27.2% of all the town's stops but 45% of all the Hispanic drivers stopped in Bristol. While the proportion of Hispanic drivers stopped in zones 3 and 22 was more than three times the town average, these zones accounted for only 1.4% of the town's stops. It is worth noting that 87% of all Hispanic drivers stopped in Bristol were not residents of the town. Figure 10.4 shows the difference between the Hispanic drivers stopped by patrol area and the town average.

Figure 10. 4: Hispanic Drivers Stopped Compared to Town Average



X.C: Non-Resident Component of Bristol Traffic Stops

To a great degree, Bristol's traffic stop data tended to reflect two basic influences: (1) a very low non-white driving age resident population and (2) a fairly large proportion of non- residents who make up the majority of people who were stopped in town. Bristol's resident driving age population is estimated as 96% white, 0.7% black, 2% Hispanic, and 0.8% Asian/Pacific Islander. The demographics of the Bristol residents who were stopped during the study year showed only a small disparity for black drivers, but no other racial or ethnic groups (1.7% of resident drivers stopped were black compared to the town resident population, which is 0.7% black.) The disparity was more significant for non-resident stops. Since 59% of all drivers stopped in Bristol were not residents, out-of-town drivers clearly had an impact on the stop data.

The racial breakdown of drivers stopped who were not residents was: 88.6% white, 4.3% Hispanic, 5.5% black, and 1.5% Asian/Pacific Islander. In comparison to stop demographics (including both residents and non-residents), the overall effect of non-resident minority drivers stopped is fairly clear, though it is more significant in some patrol zones more than others. Non-resident drivers were less white (88.6% compared to 92%,), more black (5.5% compared to 3.9%), more Hispanic (4.3% compared to 2.9%), and only slightly more Asian/Pacific Islander (1.5% compared to 1.1%). The combined percentages for all non-resident minority drivers was 11.3% compared to 7.9% for all stops. Approximately 82% of black drivers and 87% of Hispanic drivers stopped were not residents, compared to 56% of white drivers.

As previously noted in this report, the resident driver component of the Bristol traffic stop data was one of the highest for any Rhode Island municipality and well below the state average. The average non-resident component for all 37 Rhode Island municipalities was 73.5%. Bristol's non-resident component was 58.6%. Thus. while Bristol's data exhibits a significant non-resident driver influence it seems to be less than many other Rhode Island towns.

Our examination of all 22 Bristol patrol districts identifies several districts where the non-resident effect may be the most pronounced. Zones 12 and 8 are significant in several respects. They are the two most

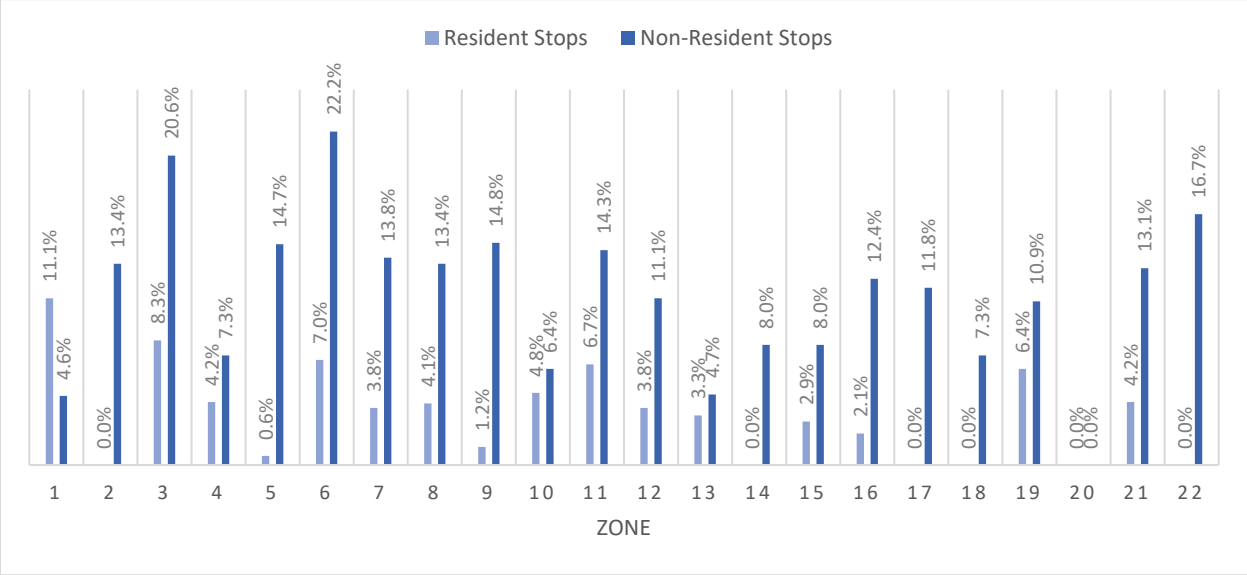
active enforcement areas in Bristol with 13.4% and 12.1% of all stops made. Zone 12 ranks second in the total number of black drivers stopped (25), 92% of whom were non-residents. It also had the second most Hispanic drivers stopped (17), 71% of whom were non-residents. The overall proportion of non-residents stopped in zone 12 was only 59%. Zone 8 ranks first in the number of black drivers stopped (29—76% non-residents) and third in the number of Hispanic drivers stopped (13—92% non-residents). The overall proportion of non-residents stopped in zone 8 was only 49%, the second lowest proportion of non-residents in any of the 22 zones.

The other zones of note were zone 10 (3rd highest enforcement levels, 4th most black drivers stopped and 5th most Hispanic drivers stopped), zone 7 (5th highest enforcement levels, 3rd most black drivers stopped and 4th most Hispanic drivers stopped), and zone 5 (4th highest enforcement levels and highest number of Hispanic drivers stopped). The black drivers stopped in these three zones combined were 69% non-residents. The Hispanic drivers stopped were 89.5% non-residents.

Finally, zone 21 exhibited some unique characteristics. While it ranked seventh in enforcement activity (5.8% of stops), it had the fifth most black drivers stopped and the fourth most Hispanic drivers stopped. Non-residents comprised 88% of the black and Hispanic drivers stopped. Zone 21 had the largest overall proportion of non-residents stopped of any patrol zone (74.4%).

Figure 10.5 shows the percentage of minority resident drivers stopped by zone compared to minority non-resident drivers stopped. The values shown in Figure 4.1 for each zone show the proportion of residents stopped in the zone who were minority drivers and the proportion of non-residents stopped who were minority drivers.

Figure 10. 5: Percent Minority Resident Drivers compared to Minority Non-Resident Drivers



X.D: Special Enforcement Campaigns

Bristol participated in special enforcement campaigns that were sponsored by the Rhode Island Department of Transportation through funds made available by the National Highway Traffic Safety Administration (NHTSA). Bristol reported a total of 258 stops as part of the NHTSA-funded campaigns

which amounted to 5.4% of all the stops made in the town. The Special Enforcement campaigns in which Bristol participated focused on (1) seatbelt safety ("Click-It or Ticket"), (2) driving while intoxicated (DWI), (3) Speed enforcement and (4) distracted driving. The Bristol Police Department was able to identify only the dates, times, and basic stop information for special enforcement campaigns. The case numbers for each stop were not available to match to the traffic stop database.

Of the 258 stops made as part of the special enforcement campaigns, 111 (43%) were reported as part of the driving while intoxicated campaigns, 34 (13%) were part of "Click-It or Ticket" campaigns, 72 (28%) were part of the speeding enforcement campaign, and 41 (16%) were part of a distracted driving campaign. Bristol appeared to participate in NHTSA funded campaigns primarily during the summer months when traffic volumes were likely to have been greater due to summer recreational activities. The drunk driving campaigns took place in April, May, June, July, and September 2018. Speed enforcement campaigns took place in March, May, August, and September. Distracted Driving campaigns took place in July, August, and September. Finally, "Click-It or Ticket" campaigns took place in July, August, and September.

When a town has participated in these enforcement campaigns and made a significant portion of its total traffic stops as part of them, it can add an additional dimension to analysis of the town's stop data because they can affect the overall data for the town in several ways. For example, stop outcomes for stops made during selective enforcement campaigns can, and usually do, result in a high proportion of penalty outcomes rather than warnings compared to stops made during regular routine patrol activities where officers may have more discretion in deciding whether or not to ticket the violator. Imposition of penalty-based outcomes is one of the tenets for participation in these federally funded programs. Stop demographics can also differ, particularly with respect to distracted driving campaigns which focus primarily, though not exclusively, on cell phone use. In general, cell phone stop demographics statistically tend to show higher proportions of female violators and lower proportions of minority drivers than is typical for other types of motor vehicle violations. Finally, the criteria for selection of locations to conduct selective enforcement could differ in some ways from the way stops are generally conducted. For example, effective distracted driving enforcement requires officers to be able to observe drivers in their vehicles without being observed themselves, which can make some locations for this type of enforcement more suitable than others even though the less suitable locations might have as many drivers potentially violating the targeted laws than the more suitable enforcement locations.

X.E: Post-Stop Outcome Review

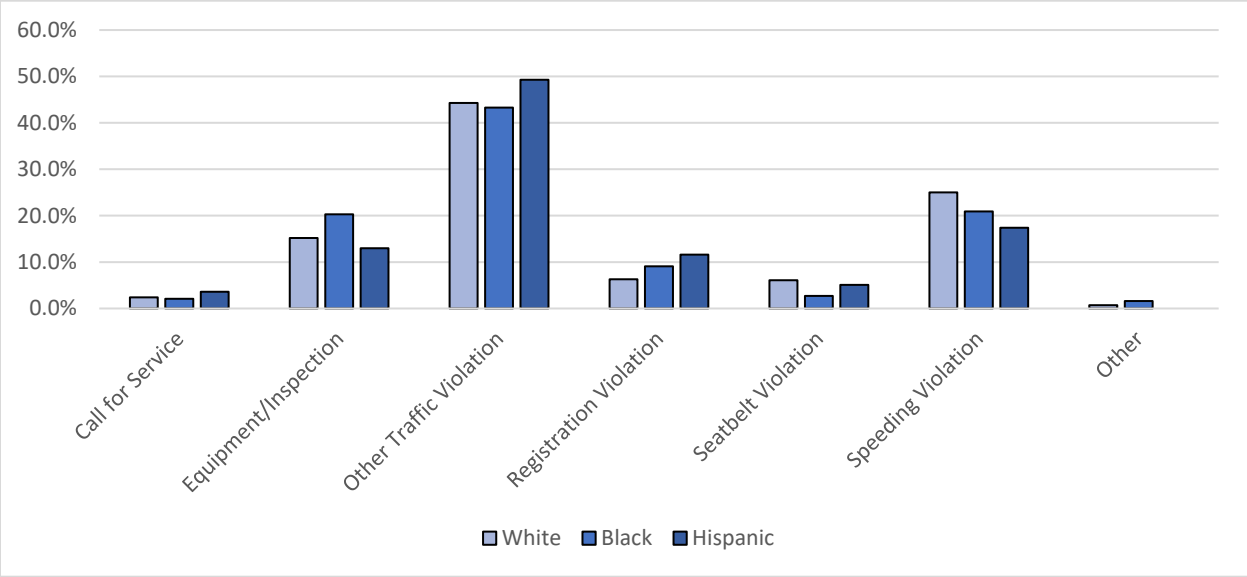
Basis for Stops

The reasons police use to stop a motor vehicle can vary significantly from department to department. We reviewed the basis for each stop that Bristol officers reported as the reason for stopping motor vehicles. The three most common reasons for stopping a motorist in Bristol made up 84% of the total stops. The three largest stop categories were for Other Traffic Violations[17] (44%), speeding violations (24%), and equipment or inspection violations (16%). While white drivers were stopped more frequently than black

[17] If a stop was made for a reason other than one of the 11 categories listed as the basis for the stop, it is recorded as "other traffic violation." Some examples of stops that might be recorded as "other traffic violation" include a traffic light violation or stop sign violation.

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- and inspection-related violations than white drivers as a percentage of their total stops. Figure 10.6 illustrates by race and ethnicity the reason officers cited to stop a motor vehicle. Although we identify and discuss disparities in stop outcomes below, the sample size for both black and Hispanic drivers are small and should be considered before drawing conclusions.

Figure 10. 6: Basis for Traffic Stops



Unfortunately, the way in which data is collected in Rhode Island does not allow a differentiation between equipment and inspection related stops, so these stops can't be separated from each other for analysis. There are a number of different violations that could be categorized as equipment violations, but the most common example is likely a stop made for defective lighting. On the other hand, an inspection violation would only occur if the vehicle was not in compliance with the Rhode Island motor vehicle inspection law. All vehicles registered in Rhode Island must have a valid Rhode Island inspection sticker. A vehicle safety and emissions test must be performed at least once every two years. That having been said, 16% (738 stops) of Bristol's stops were made for equipment- or inspection-related violations. This was below the state average of 20% during the study year. Of all the Hispanic drivers stopped in Bristol, 13% (18 stops) were stopped for equipment- or inspection-related violations. In addition, 20% (38 stops) of all the black drivers stopped in the town were pulled over for equipment- or inspection-related reasons. This compared to 15% (667 stops) of all white drivers. Conversely, 69% (3,033 stops) of all the white drivers stopped in town were stopped for hazardous driving behaviors (such as speeding and other traffic violations) compared to 64% (120 stops) of black drivers and 67% (92 stops) of Hispanic drivers.

Over 46% (340 stops) of all equipment-related stops were made in five patrol zones (8, 10, 12, 13, and 16). All five of these patrol zones are in the center of town from Gooding Avenue to Woodlawn Avenue and include a large section of Route 114. More specifically 12% (87 stops) were made in zone 12, 10% (72 stops) were made in zone 16, 9% (64 stops) were made in zone 10, 8% (60 stops) were made in zone 8, and 8% (57 stops) were made in zone 13. Although the majority of these stops were made in the high enforcement area of town, there were also extensive equipment and inspection-related stops made

throughout the town. These stops represented a significant percentage of the traffic stops made in many patrol zones, except zones 5, 7, 15, 18, and 21. Overall, 53% of all the black drivers stopped for equipment/inspection related reasons were stopped in four zones—6, 8, 9, and 12. Zones 8 and 12 are the two highest enforcement areas in Bristol. The proportion of black drivers among those stopped for equipment/inspection related reasons was modest in these two zones and largely reflective of the greater numbers of drivers stopped for all reasons in these two zones (5.7% of those stopped for these reasons in zone 12 and 8.3% in zone 8). The proportion of black drivers represented among those stopped for these reasons in zones 6 and 9 were more significant (16.7% of those stopped for equipment/inspection violations in zone 6 and 11.8% in zone 9).

In addition to disparities identified in stops made for equipment/inspection violations, researchers also identified disparities in stops made for registration violations. Approximately 7% (313 stops) were made for registration violations. This was below the state average of 8% during the study year. Of all the Hispanic drivers stopped in Bristol, 12% (16 stops) of them were stopped for registration violations. In addition, 9% (17 stops) of all the black drivers stopped in the town were pulled over for registration violations. This compared to 6% (276 stops) of all white drivers. Only five of the 24 zones had more than 20 stops for registration violations conducted in each zone, which accounted for 58% (182 stops) of all registration stops. Those five zones (zones 5, 7, 8, 10, and 12) were again concentrated along a large portion of the Route 114 corridor and in the downtown area. Once again, these zones are the busiest corridors in town and appear to have a higher percentage of non-resident minority drivers traversing them than other areas in town.

Speed enforcement was also a significant basis for a traffic stop in Bristol. There were 1,166 stops made for speeding (25% of all stops). This was a lower percentage of speed related stops when compared to the statewide average of 30% during the study year. Officers frequently rely on modern technology-based enforcement techniques, like using radar or a laser device, to make speeding stops. Depending on the types of locations and vehicle travel speeds involved, using technology-based enforcement techniques is sometimes considered to be “blind”, that is, the officer may have a reduced opportunity to specifically identify driver characteristics before making a decision to act than with other types of violations where a more direct and frequently prolonged observation of the vehicle is made. At least theoretically, if all speeding stops could be considered blind with respect to predetermination of the drivers’ racial characteristics, they could possibly provide a useful if clearly imperfect window into the general racial make-up of drivers driving in an enforcement area.

Unfortunately, the data available from Rhode Island does not capture information on technology-based speeding stops. That having been said, we believe it is reasonable to assume that a significant portion to Bristol’s speeding stops were probably technology based and provide the following analysis based on that assumption. The demographics for all speed-related stops in Bristol were 2.1% Hispanic drivers (24 stops), 3.3% black drivers (39 stops), 1% Asian and other drivers (8 stops), and 94% white drivers (1,095 stops). There was a higher percentage of white drivers stopped for speed-related violations compared to their overall proportion of all other stops made (94% compared to 91%). However, black and Hispanic drivers were stopped at a lower rate for speed-related violations than their overall proportion of all other stops (Black drivers – 3% compared to 4% and Hispanic drivers – 2% compared to 3%.)

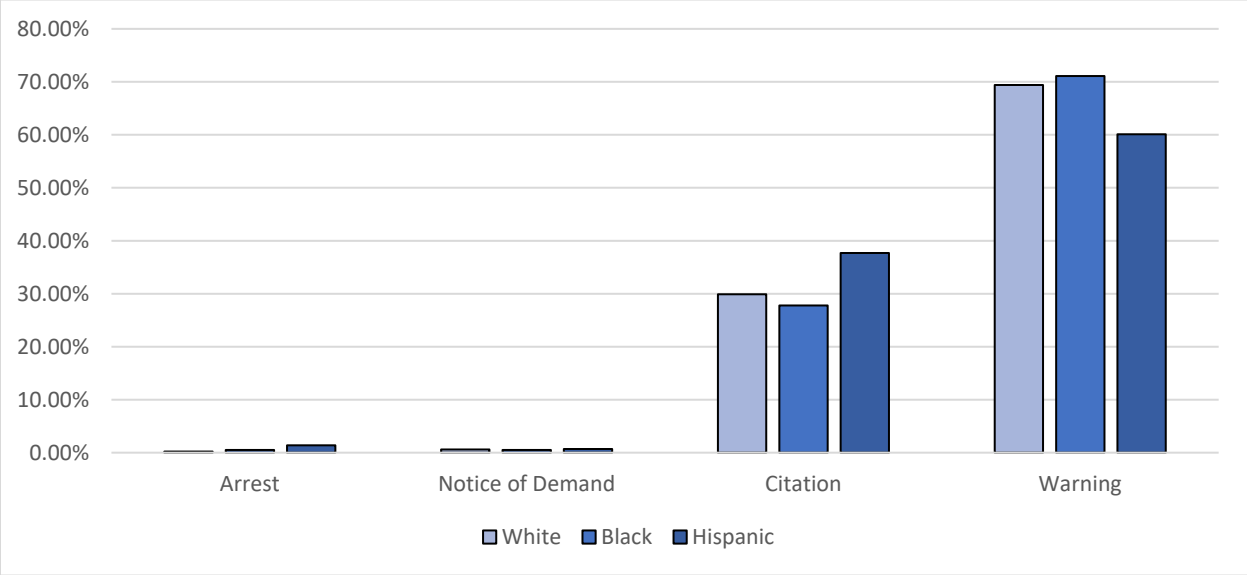
The largest number of speed-related stops occurred in five patrol zones along the Route 114 corridor (zones 8, 10, 12, 18, and 21). According to the department, speed enforcement is more highly

concentrated along the Route 114 corridor. There are very few traffic signals along Route 114 making speeding a greater problem that the department needs to focus on in this area. Metacom Avenue is the other major corridor in town, but this roadway has significantly more traffic signals, making it more challenging for drivers to speed. The five high enforcement zones along the Route 114 corridor accounted for 65% of all speed-related stops. The demographics for these stops were 2% Hispanic drivers, 3.6% black drivers, 0.4% Asian drivers, and 94% white drivers. There was again a higher proportion of white drivers stopped for speed-related violations in these five high enforcement zones than their proportion of all other stops in those areas (94% compared to 91%). A slightly smaller proportion of black and Hispanic drivers were stopped for speed-related violations in these five zones than their proportion of all other stops in that area (Black drivers – 3.6% compared to 4.2% and Hispanic drivers – 2% compared to 3%.) If, arguably, speeding stops might represent a better proxy of the actual driving population at any given time than all stops considered together, speeding stops may actually help to mitigate what could be a larger disparity in all stops not related to speed. The racial demographics of all speed-related stops in Bristol more closely mirrored the racial demographics for all stops in town. This could be an indication that police are stopping a representative sample of the actual driving population in town.

Outcome of Stops

The majority of motor vehicle stops in Bristol resulted in the driver receiving a warning (69%). When compared to white drivers, black drivers were slightly more likely to receive a warning as a percentage of their total stops. However, Hispanic drivers were less likely to receive a warning and more likely to receive a citation than both white and black drivers. Figure 10.7 shows the outcome of motor vehicle stops by race and ethnicity.

Figure 10. 7: Outcome of Traffic Stop



Drivers were significantly more likely to receive a warning as a result of an equipment or inspection violation compared to all other violations. Of the drivers stopped for equipment- and inspection-related violations, 81% resulted in a warning whereas only 67% of stops for all other types of violations resulted in a warning. There were only 10 arrests and 27 notice and demands that resulted from a traffic stop. A

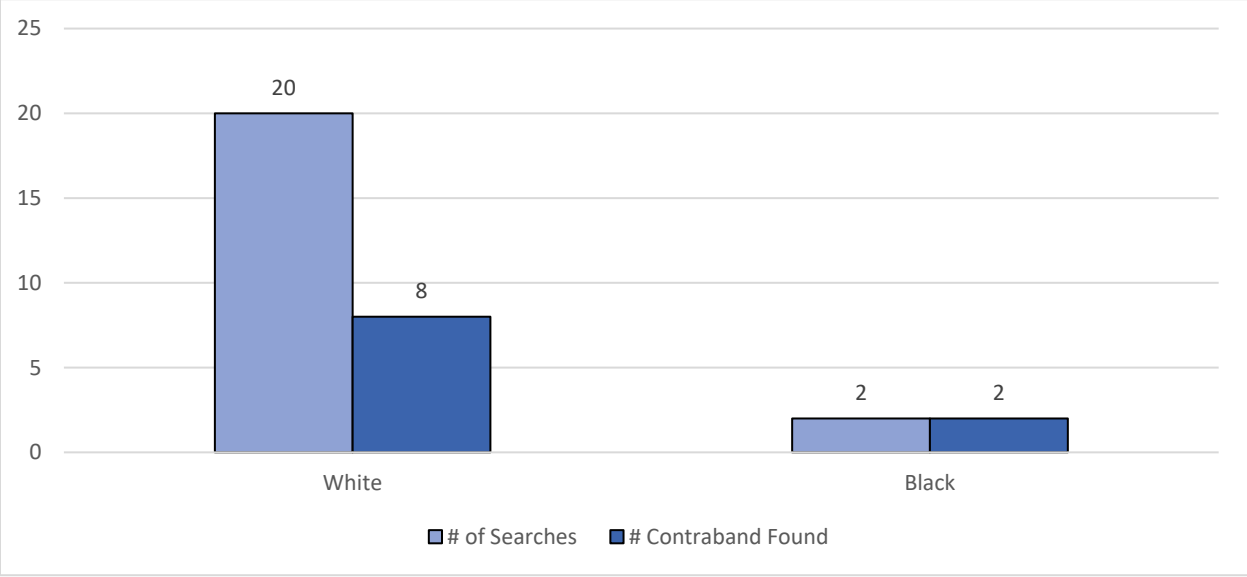
notice and demand are typically given for non-moving violations when a vehicle has a defect that needs to be addressed. The notice provides the driver with five working days to fix the issue and have the vehicle inspected. Failure to correct the problem results in a review by the traffic court.

Hispanic drivers were more likely to be cited as a result of a stop compared to white or black drivers. Almost 38% of Hispanic drivers received a citation compared to 30% of white drivers and 28% of black driver. This disparity is likely correlated to the disparity in stops made for a registration violation. Officers have very little discretion when it comes to issuing a citation for a registration violation. Hispanic drivers were significantly more likely to be stopped for a registration violation compared to either white or black drivers. The vast majority (80%) of registration violations resulted in a citation. Therefore, if Hispanic drivers are more likely to be stopped for a registration violation then it is unsurprising that there would also be a disparity in the overall stop dispositions.

Search Information

A review of department search information shows that less than 1% (22) of the drivers stopped in Bristol were subjected to a motor vehicle search. This rate of motor vehicle searches is significantly lower than the state's 3.8% average. Stops of black drivers resulted in a search at twice the rate of white drivers, but only two black drivers were searched. There were no Hispanic drivers searched during the study period. The dataset was too small to draw any meaningful conclusions about search disparities. Because the number of driver searches was too small to draw any significant conclusions from, we caution against doing so based on this summary information. Figure 10.8 illustrates the searches and the rate at which contraband was found (the "hit rate").

Figure 10. 8: Search and Hit Rate



X.F: 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, areas with high accident rates and 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 some of these factors. Basic information on crime, accidents, and other economic factors associated with Bristol provide a context to potentially explain the rational for police deployments that are important considerations.

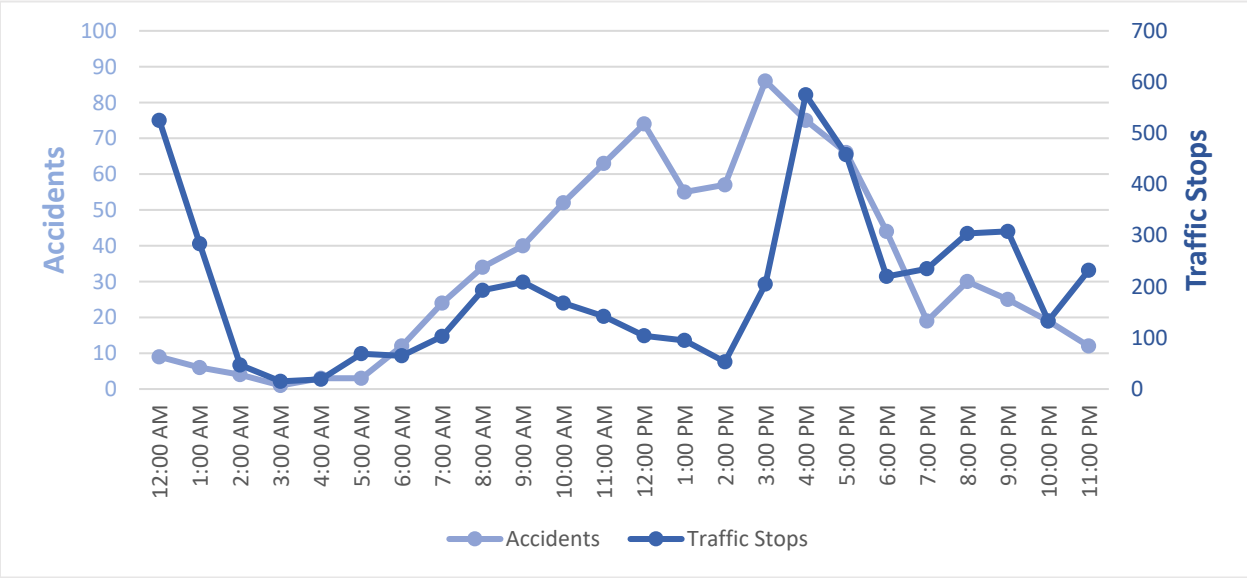
Bristol reported 357 index crimes in 2018, which are eight crimes the FBI combines to produce its annual crime index. The offenses include homicide, forcible rape, robbery, burglary, aggravated assault, larceny over $50, motor vehicle theft, and arson. Of the 357 offenses, 24% (87 offenses) were for destruction or property or vandalism, 23.5% (84 offenses) were for assault, 22% (79 offenses) were for a larceny, 11% (39 offenses) were for drug violations, and the remaining 19% (68 offenses) were for some other offense. The most offenses occurred in July (43 offenses), September (41 offenses), and November (41 offenses). Crime data and pattern activity is an integral component of a department's crime control and reduction strategy. Taking into consideration the location of Bristol's overall index crimes in more detail helps to provide a better understanding of what may be leading Bristol officers to be more active in some areas of the town than in others. Unfortunately, location information was not available for criminal offenses to be considered in our analysis.

The Bristol police department also provided researchers with a summary of dispatch logs or calls for service, which included calls for service and officer-initiated actions that were called in to police dispatch. The logs report approximately 27,000 entries from January 1, 2018 through December 31, 2018. Three roadways accounted for 42% of all records in the dispatch log. Those roadways were Metacom Avenue with 20% of call records (5,445 records), Hope Street with 13% of call records (3,588 records), and Wood Street with 9% of call records (2,303 records). Significant call activity also occurred in zones 12, 13, and 15. These three zones accounted for 38% of all calls for service, with 15% of calls in zone 12, 11.5% in zone 13 and 12% in zone 15. These three zones make-up the downtown area, which includes Bristol Harbor and most restaurants and bars in town.

During our study period, there were approximately 813 motor vehicle accidents on roads patrolled by the Bristol Police Department. Accidents were reported as occurring on 116 roads. The roadways with the highest number of accidents were Metacom Avenue (267 accidents), Hope Street (150 accidents), Ferry Road (42 accidents), and Gooding Avenue (29 accidents). There were only 11 roads with 10 or more accidents and those roads account for 75% of all accidents in Bristol. Metacom Avenue accounted for 33% of all accidents in the town and Hope Street accounted for 18% of all accidents in town. According to the department, rear-end collisions are common along Metacom Avenue. This is largely due to the number of traffic lights and the roadway configuration which often causes significant traffic delays. Recent traffic improvements by the Department of Transportation have improved this problem and should be reflected in accident rates in the coming years.

Figure 10.9 illustrates the time of day when traffic accidents were reported, and the number of traffic stops that occurred during that same period. This shows how closely traffic enforcement is correlated with traffic accidents in Bristol. While the vehicle crash rate tends to build steadily throughout the day in town, it peaks during the afternoon period from 12:00 p.m. to 5:00 p.m. On the other hand, traffic enforcement peaks between 2:00 p.m. and 5:00 p.m. and again between 11:00 p.m. and 1:00 a.m.

Figure 10. 9: Accidents Compared to Traffic Stops by Time of Day



X.G: Summary of Findings

The Bristol Police Department identified factors they believe contributed to the disparity identified in the initial analysis of traffic stops. The department identified areas with the highest call for service volume, the highest crime rates and the highest levels of traffic as some of the same areas with the highest levels of motor vehicle enforcement. Our analysis of traffic stops by patrol area confirms that departmental resources are more highly concentrated in the center of the town, especially in the patrol areas that include Route 114 and Metacom Avenue. Route 114 is the main thoroughfare through the town and runs from the border of Warren south to the intersection of Wood Street where it becomes Ferry Road. Ferry Road eventually turns into the Mount Hope Bridge, which connects Bristol to Portsmouth, Middletown, and, eventually, Newport. It is considered a major north-south artery in northern Rhode Island. Bristol also hosts Roger Williams University, a private four-year college with approximately 4,000 undergraduate students and 800 graduate students. The university is one of the town's largest employers with just under 500 academic staff members and other support staff employees.

Bristol is divided into 24 patrol zones for reporting purposes, but traffic enforcement appears to be concentrated in four patrol areas, zones 5, 8, 10, and 12, which accounted for 43% of all stops in town. Zones 8 and 12 combined accounted for 25% of all Bristol stops. In these four zones the stop demographics included 8% minority drivers and 92% white drivers, but these stops accounted for 41% of all the minority drivers stopped in Bristol. Black drivers were stopped in nine of the patrol areas at a higher rate than the town average (zones 2, 3, 6, 7, 8, 9, 11, 19, and 21). These nine patrol areas accounted for 43% of the town's stops, but 58% of all the black drivers stopped in town. Hispanic drivers were stopped in eight of the patrol areas at a higher rate than the town average (zones 3, 4, 5, 6, 7, 17, 21, and 22). These eight zones accounted for 27% of all the town's stops, but 45% of all the Hispanic drivers stopped in town.

Bristol's traffic stop data also reflects (1) a very low non-white driving age resident population and (2) a fairly large proportion of non-residents who make up the majority of people who were stopped in town. Since 59% of all drivers stopped in Bristol were non-residents, the overall impact out-of-town drivers had

on the stop data is fairly clear. Non-resident black and Hispanic drivers were more likely to be stopped than non-resident white drivers. Approximately 82% of black drivers stopped and 87% of Hispanic drivers stopped were not residents, compared to 56% of white drivers who were non-residents. The influence non-resident drivers had on stop demographics affected patrol areas to varying degrees. For example, zones 8 and 12 were the two most active enforcement areas on Bristol but had the lowest proportion of non-residents of any of the patrol areas (55% of drivers stopped were non-residents). On the other hand, the patrol areas that make-up the southern part of town (zones 15, 16, 17, 18, 19, 20, and 21) accounted for 26% of traffic enforcement but had a higher proportion of non-resident drivers stopped (69% of drivers stopped were non-residents.) The southern sections of Route 114 and Metacom Avenue from the Mount Hope Bridge to State Street appear to be more heavily influenced by non-resident drivers.

Traffic Stop Outcomes

In Bristol, the three most common reasons used for stopping a motorist make up 84% of the total stops. The three largest stop categories were for Other Traffic Violations[18] (44%), speeding violations (24%), and equipment or inspection violations (16%). 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- and inspection-related violations than white drivers as a percentage of their total stops.

Racial and ethnic disparities were most pronounced in equipment/inspection violations, registration violations and speeding violations. Over 29% of black drivers and 25% of Hispanic drivers were stopped for registration or equipment/ inspection violations compared to 22% of white drivers. Conversely, 70% of all the white drivers stopped in town were stopped for hazardous driving behaviors (such as speeding and other traffic violations) compared to 64% of black drivers and 66% of Hispanic drivers. The data shows that, with respect to the racial and ethnic demographics of those stopped, both registration violations and equipment- or inspection-related stops are closely related to the frequency and location of where the stops are made. A majority of these stops were made in the high enforcement patrol zones in the center of town and along the Route 114 corridor. The frequency and location of these stops in the high enforcement patrol areas, with a large percentage of non-resident minority drivers traversing them, appears to have been an important factor in the Bristol disparity involving black and Hispanic drivers.

Speed enforcement was also a significant basis for traffic stops and accounted for 25% of all stops. Officers frequently rely on modern technology-based enforcement techniques, like using radar or a laser device, to make speeding stops. Using technology-based enforcement techniques is sometimes considered to be "blind", that is, the officer may have a reduced opportunity to specifically identify driver characteristics before deciding to stop a vehicle. The largest percentage of speed-related stops (65%) were made in five patrol districts along the Route 114 corridor (zones 8, 10, 12, 18, and 21). The demographics for the speed stops made in these five zones were 2% Hispanic drivers, 4% black drivers, 0.4% Asian drivers, and 94% white drivers. A higher proportion of white drivers and a smaller proportion of black and Hispanic drivers were stopped for speed-related violations in these high enforcement patrol areas than their proportion

[18] If a stop was made for a reason other than one of the 11 categories listed as the basis for the stop, it is recorded as "other traffic violation." Some examples of stops that might be recorded as "other traffic violation" include a traffic light violation or stop sign violation.

of all other stops in that area. At least theoretically, if all speeding stops could be considered blind with respect to predetermination of the drivers' racial characteristics, they could possibly provide a useful if clearly imperfect window into the general racial make-up of drivers driving in an enforcement area. The racial demographics of all speed-related stops in Bristol more closely mirrored the racial demographics for all stops in town. Of the drivers stopped for speeding, 94% were white, 3.3% were black and 2.1% were Hispanic. A slightly smaller percentage of black and Hispanic drivers were stopped for speeding than their overall representation in all stops, but the differences were small. This could be an indication that police are stopping a representative sample of the actual driving population in town.

Regarding stop outcomes, the majority of vehicle stops in Bristol resulted in the driver receiving a warning. Black drivers were slightly more likely to receive a warning as a result of a stop and Hispanic drivers were more likely to receive a citation. Drivers were significantly more likely to receive a warning as a result of an equipment or inspection violation. Additionally, drivers were more likely to receive a citation as a result of a registration violation. Since black drivers were more likely to be stopped for equipment or inspection violations and Hispanic drivers were more likely to be stopped for registration violations it is unsurprising that there would also be a disparity in the stop dispositions.

Bristol police searched fewer than 1% of the drivers they stopped, which was below the state average of 3.8%. Black drivers were searched at twice the rate of white drivers, but only two black drivers were searched. There were no Hispanic drivers searched during the study period. Given the relatively small number of searches conducted, no meaningful conclusions can be drawn.

Conclusion

Taken as a whole, the Bristol traffic stop data reflects the influence of the Route 114 and Metacom Avenue corridors that appear to be somewhat more diverse than the predominantly white resident driving age population. The patrol areas around these roads appear to have a relatively high level of enforcement and a relatively higher proportion of non-resident minority drivers traveling them. Both corridors are major traffic generators for the town with areas that have large commercial activity and seasonal attractions such as public beaches. The high enforcement patrol areas also mirror where the highest call for service volume, the highest crime rates and the highest levels of traffic occur.

After a full review, the disparities do not appear excessive in nature. However, in the future if the department should see racial and ethnic disparities increase from the level established in this report, it is recommended that the department:

(1) review its traffic enforcement policies in along Route 114 and Metacom Avenue in order to evaluate the extent to which they may have a disproportionate effect on black and Hispanic drivers and
(2) evaluate both the location and frequency of stops that involve equipment- or inspection-related motor vehicle violations and registration violations, to better understand the impact they may be having on minority drivers.

Department Response

Below on page 64 is a response provided by Bristol Police Chief, Kevin M. Lynch.

Bristol Police Department

"A Nationally Accredited Agency"

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TELEPHONE (401) 253-6900

Mr. Ken Barone
Project Manager
Institute for Municipal and Regional Policy
Central Connecticut State University
185 Main Street, Suite 215
New Britain, Connecticut 06051

April 7, 2020

Dear Mr. Barone:

Thank you for the opportunity to provide a response to the follow-up report completed by Central Connecticut State University's enhanced analysis of the 2018 traffic stop data for the Bristol Police Department. This letter serves as a means to provide commentary concerning the report and the recommendations that were made.

The Bristol Police Department prides itself on providing exemplary police services to more than 23,000 residents, as well as the many citizens who work and visit our town. The Bristol Police Department achieved and is dedicated to maintaining both national and state accreditation. Accreditation ensures our agency adheres to "Best Practices" in law enforcement as we are continually striving to enhance the services we provide to our citizens and visitors. A required standard mandated by both national and state accreditation organizations establishes the Bristol Police Department provides ongoing training to all department members, which include topics such as fair and impartial policing. The Bristol Police Department has developed policies and follow state laws that strictly prohibit the practices of bias-based policing and in ensuring compliance, an annual policy review and analysis of all traffic stops, and searches is conducted. Part of the annual analysis includes reviewing citizen complaints. To date, the Bristol Police Department has not received a complaint regarding bias-based policing.

Regarding the recommendations you provided in this follow-up report, we would like to share the following information;

1. *Review its traffic enforcement policies along Route 114 and Metacom Avenue in order to evaluate the extent to which they may have a disproportionate effect on black and Hispanic drivers.*

Speed enforcement is concentrated along Route 114 (Hope Street) due to few traffic signals along Route 114 making speeding an issue that requires a greater focus in this area. Most traffic enforcement on Route 114 is directed to the downtown area due to this area being densely populated with restaurants, bars, and other businesses that experience heavy pedestrian and motor vehicle traffic. Pedestrian safety and enforcement in the Downtown area is a priority of the Bristol Police Department.

Route 136 (Metacom Avenue) is the other major corridor in town. Although Route 136 has significantly more traffic signals then Route 114, making it challenging for drivers to speed, rear-end collisions are common along Route 136 particularly on the northern segment of this arterial roadway. The goal of traffic enforcement in this area is to reduce the number of traffic collisions. Recent intersection and traffic light improvements by the Rhode Island Department of Transportation have been completed with the goal of improving traffic safety.

2. *Evaluate both the location and frequency of stops that involve equipment or inspection related motor vehicle violations and registration violations, to better understand the impact they may be having on minority drivers.*

The Bristol Police Department does not have a standing policy or directive that focuses on equipment or inspection violations. We are currently reviewing the data collected, along with the potential issues identified in this report. The department is currently working to identify methods to enhance our public traffic safety education programs as a means of educating motorists on several topics relating to motor vehicle and pedestrian safety.

In closing, the Bristol Police Department appreciates your efforts, as well as the efforts of your colleagues in compiling and analyzing the data collected. While we will continue to focus our attention on the Route 114 and 136 travel corridors and continue to make certain that our officers understand the impact the Bristol Police Department's traffic enforcement efforts have on all drivers.

Thank you again for this opportunity to provide a response and we look forward to working with you in the future.

Sincerely,

Kevin M. Lynch
Chief of Police

XI: SMITHFIELD 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 researchers conduct an in-depth analysis for the Smithfield Police Department.

According to the results from the "Solar Visibility" analysis, the Smithfield Police Department indicated a statistically significant disparity in the rates that black motorists were stopped during daylight relative to darkness. Within the inter-twilight window, the odds that a stopped motorist was black increased by 2.1 during daylight relative to darkness. These results were statistically significant at a level greater than 99 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 2018 calendar year, the Smithfield Police Department made 4,983 traffic stops. Of these, 16% were minority stops (7.7% Hispanic and 6.7% black, 1.5% Asian/Pacific Islander). Table 11.1 below compares summary racial data for reported traffic stops in Smithfield over a three-year period.

Table 11. 1: Smithfield Traffic Stops – 2016 - 2018

	2016 Stops		2017 Stops		2018 Stops	
White	3,645	86.4%	4,442	84.1%	4,193	84.1%
Black	242	5.7%	385	7.3%	333	6.7%
Asian	67	1.6%	84	1.6%	74	1.5%
NA*	1	0.0%	5	0.1%	1	0.0%
Hispanic	261	6.2%	363	6.9%	382	7.7%
Total	**4,216**		**5,279**		**4,983**	

*Native American

XI.A: Descriptive Analysis of the 2018 Traffic Stop Data

Researchers studied the racial and ethnic disparities in the Smithfield Police Department data using a more detailed review of traffic enforcement during the study period. Part of the analysis involved reviewing the detailed location descriptions provided by the department and any enhancement we were able to make. Smithfield officers record the location of a traffic stop by patrol zones. The town is divided into three patrol zones (East, Central and West). Although we are unable to determine the specific street location of each stop, the patrol zones provide us with enough information to assess the differences in areas within the town.

According to the 2010 census, Smithfield is a town with approximately 18,280 residents over the age of 16. Approximately 5% of the driving age population in Smithfield is identified as a minority. Table 11.2 outlines the basic demographic information for Smithfield residents over age 16.

Table 11. 2: Smithfield Population

Race/Ethnicity	16+ Population Total	% Population Total
White Non-Hispanic	17,342	94.9%
Black Non-Hispanic	218	1.2%
AsPac Non-Hispanic	238	1.3%
Hispanic	363	2.0%
Other	119	0.7%
Total	**18,280**	

Smithfield is approximately 27 square miles in area. The town is located in northern Providence County and is approximately 15 miles northwest of the city of Providence. Five other municipalities in Rhode Island border Smithfield. Smithfield is bordered by Lincoln to the east, Johnston and North Providence to the south, Glocester to the west and North Smithfield to the north. All five border towns are predominately white demographically, with an average white driving age population of 93% (compared to Smithfield's white driving age population of 95%). Of the drivers stopped in town, only 13% were residents of Smithfield. Therefore, the town is significantly impacted by traffic from other communities.

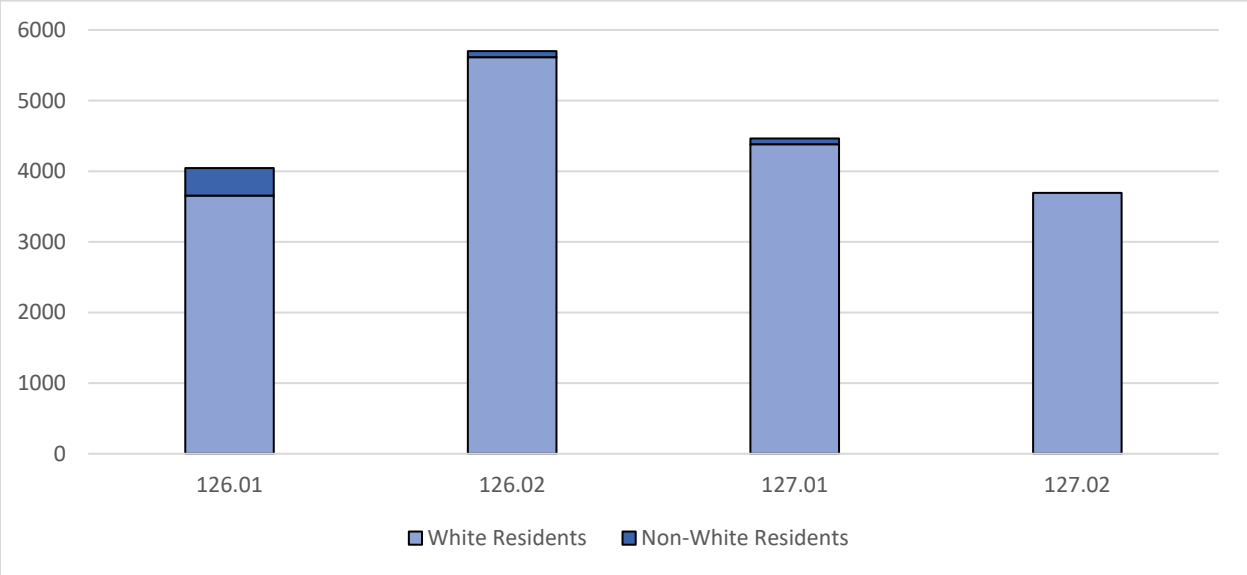
There are several major corridors that run through Smithfield including, Interstate 295 (I-295), Route 44 (locally known as the Putnam Pike), Route 7 (locally known as the Douglas Pike), and Route 104 (locally known as the Farnum Pike). I-295 is also referred to as the Providence Beltway which spans nearly 27 miles around the western part of Providence. It serves as a bypass to Interstate 95, which travels through the capital city. Just over six miles of the corridor run through Smithfield from Johnston to Lincoln. Route 44 is another major corridor that runs through the southern portion of town. The route runs for 26 miles through Rhode Island connecting Connecticut and Massachusetts. The two major local corridors in town are Route 7 (Douglas Pike) and Route 104 (Farnum Pike). Route 7 runs from the central northern part of town through the southeastern part of town. The central portion of Route 7 in Smithfield is a four-lane corridor with large commercial activity. The southern and northern portions of the roadway pass through heavily wooded areas and thin to a two-lane roadway. Finally, Route 104 runs from North Providence through Smithfield Center and eventually enters North Smithfield.

Smithfield hosts Bryant University, a private four-year college with approximately 3,500 undergraduate students and less than 300 graduate students. Bryant is located on over 400 acres of land right off Route 7 in the northern part of town, near the border with North Smithfield. The university is the towns second largest employer with just under 1,000 employees. Fidelity Investments is the largest employer in town with approximately 3,300 employees. Fidelity Investments corporate offices are located directly across Route 7 from Bryant University. Commercial activity is in close proximity to this part of town.

Traffic enforcement is primarily the responsibility of the Patrol Division. There are 27 officers assigned to the Patrol Division. It is structured with three districts and operates three shifts per day (days, evening, and mid-shift). A minimum of four patrol officers and one supervisor are assigned to each shift, with at least one officer patrolling each district. Depending on the shift there can be as many as five patrol officers and two supervisors working. The evening shift often has fewer officers assigned due to fewer calls for service. 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.

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 town, as evidenced in the census tract data. The U.S. Census Bureau divides Smithfield into four census tracts. The resident driving age population in each census tract varies from about 3,700 to about 5,700 people, with the largest concentration (32% of the total population) in tract 126.02. Census tract 126.02 borders North Smithfield in the center of town and includes the busiest parts of town such as Bryant University and Fidelity Investments Corporate Headquarters. Figure 11.1 shows the distribution for each census tract in terms of white and non-white driving age populations. While the resident Hispanic population is distributed throughout the town, the Black and Asian/Pacific Islander populations reside almost exclusively in one census tract, 126.01.

Figure 11. 1: Age 16 and Older Resident Population by Census Tract



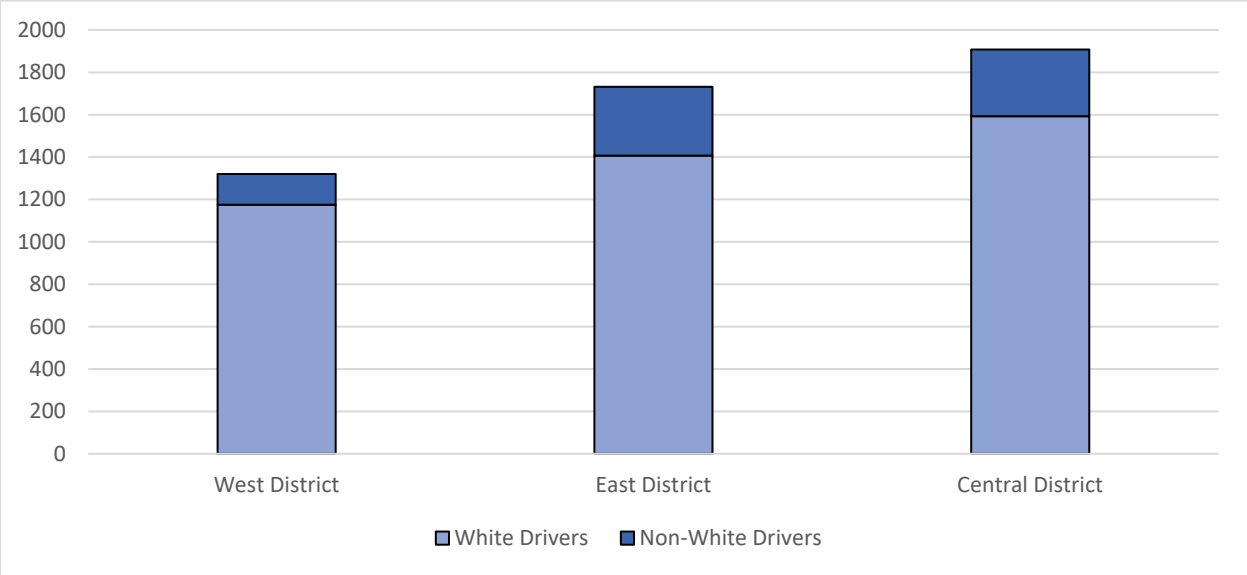
Officers reported the location of traffic stops in one of three patrol areas. Figure 11.2 illustrates the volume of traffic enforcement that occurs in each of the three patrol areas. Although the Central patrol district had the largest amount of traffic enforcement activity, the Eastern district was not far behind (38% of all traffic stops compared to 35%). The West patrol district accounted for 27% of all traffic stops.

The stop demographics in the Central district included 17% minority drivers and 83% white drivers. Minority drivers were stopped more at the highest rate in the East patrol area, with 19% of all stops in that area being a minority driver. Stops that occurred in the West patrol district included 11% minority drivers and 89% white drivers. Overall, 81% of all the minority drivers stopped in Smithfield were stopped in the Central and East patrol areas compared to 71% of all white drivers.

Proportionally. black drivers were less prevalent in the stop statistics as they traveled from east to west through the town. Of all the black drivers stopped in Smithfield, 43% were stopped in the East district, 38% were stopped in the Central district, and only 19% were stopped in the West district. Hispanic drivers had a slightly different dynamic distribution. Like black drivers, the lowest proportion of Hispanic drivers were stopped in the West district (19%) However, the proportion of all Hispanic drivers stopped in the East and Central districts were virtually identical (40.1% and 39.5% respectively).

The boundaries of the four census tracts coincide reasonably well with the boundaries of the three patrol areas. Census tract 126.01 aligns with the boundaries of the Central patrol area. Tract 126.02 aligns with the boundaries of the East patrol area and tracts 127.01 and 127.02 align with the boundaries of the West patrol area. Fifty-four percent of the town's resident driving age population live in the two census tracts that coincide with the Central and East patrol areas, but they account for 73% of all the traffic enforcement activity. The two census tracts making up the West patrol district account for almost 46% of the town's driving age population but experienced only 27% oi the town's traffic enforcement activity. Tract 126.02, which covers the East patrol area, has the largest proportion of the town's resident driving age population (32%).

Figure 11. 2: Traffic Stops by Patrol District

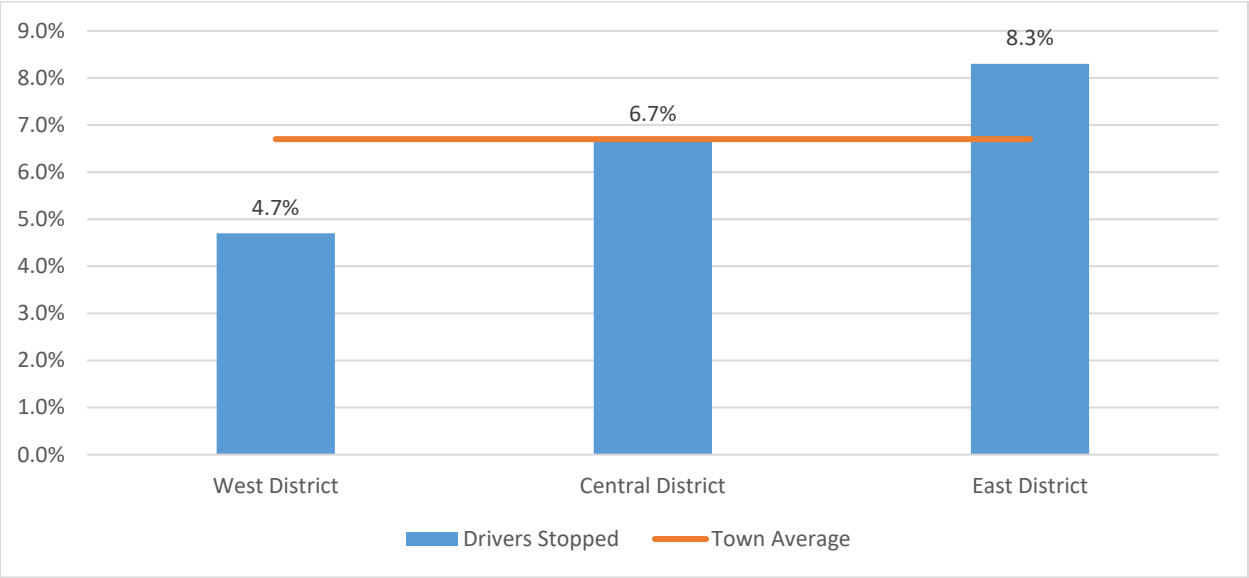


XI.B: Traffic Stop Breakdown by Race/Ethnicity

In Smithfield, 16% of all drivers stopped were minority drivers, classified as all non-white drivers, but predominantly consisting of Hispanic or black drivers. Smithfield's resident population age 16 and older is 5% minority. Considered only on its face, this threefold difference between the proportion of minority drivers stopped and the proportion of minority drivers residing in Smithfield might appear to be evidence of disparate treatment. However, the significant role non-resident drivers play in the traffic stop statistics in Smithfield needs to be considered before any such conclusions would be possible. Non-resident drivers of all racial and ethnic characteristics make up 87% of all the drivers stopped in the town. This will be addressed in greater specificity later in this analysis.

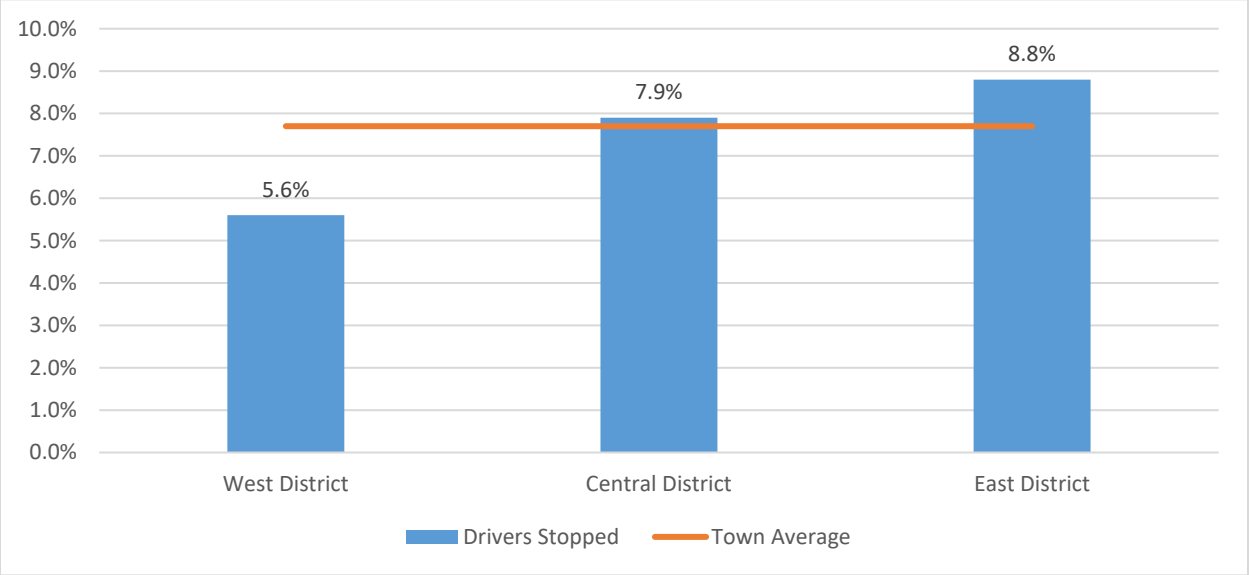
The overall percentage of Smithfield traffic stops involving black drivers was 6.7%. The town average of 6.7% of black drivers stopped was exceeded in the East patrol area where black drivers made up 8.3% of all the drivers stopped. This 8.3% comprised 43% of all the black drivers stopped in Smithfield. It is worth noting that 95% of all black drivers stopped in Smithfield were not residents of Smithfield. Figure 11.3 shows the difference between the black drivers stopped by patrol area and the town average.

Figure 11. 3: Black Drivers Stopped Compared to Town Average



The overall percentage of traffic stops involving Hispanic drivers in Smithfield was 7.7%. The percentage of Hispanic drivers stopped exceeded the town average of 7.7% in both the Central and East patrol areas, but only marginally so in the Central district. Overall, 80% of all Hispanic drivers stopped in Smithfield were stopped in the East and Central districts. It is worth noting that 95% of all Hispanic drivers stopped in Smithfield were not residents of the town. Figure 11.4 shows the difference between the Hispanic drivers stopped by patrol area and the town average.

Figure 11. 4: Hispanic Drivers Stopped Compared to Town Average



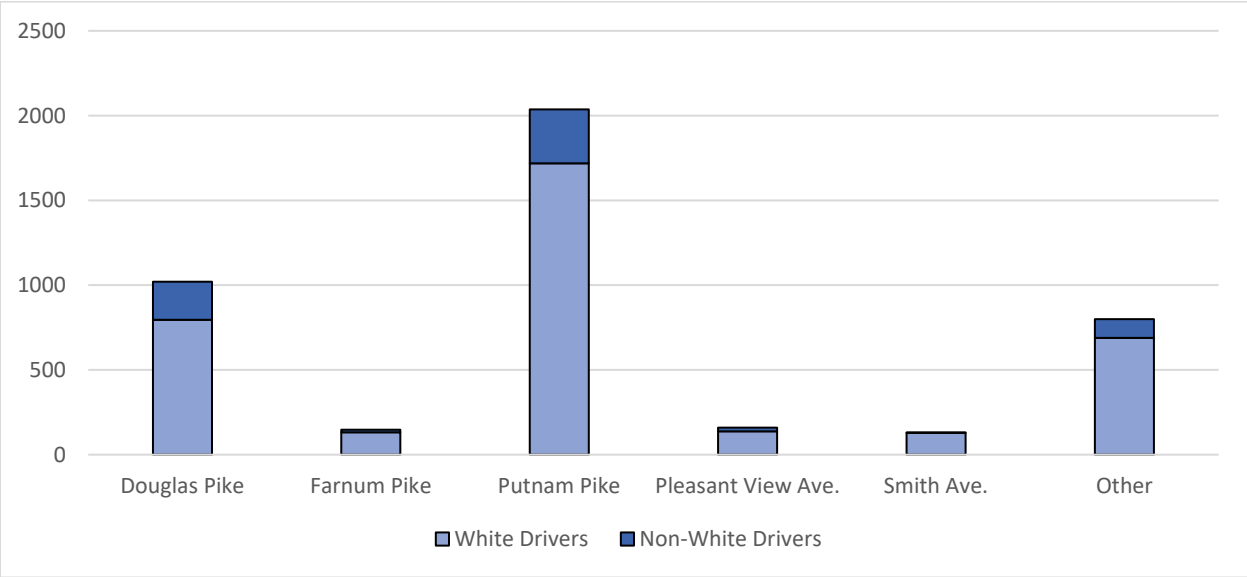
XI.C: Highway Corridor Analysis

In addition to reviewing traffic enforcement by patrol district, we conducted a separate review of the roadways with the greatest number of traffic stops. While the data submitted to the Rhode Island data collection system provides only the district in which a stop is made and not its specific roadway location,

we were able to analyze the department's traffic call logs and determine at least the road on which 4,283 of the town's 4,983 stops were made Thus, the highway corridor analysis is limited to the 86% of stops for which road level identification was possible. For the record, we note that of the 700 stops for which roadway location was not possible to determine through the call logs, more than half (52%) were made in the Central district. Based on our assessment of all the stops reported in the Central district we believe there was likely a two-in-three chance that the non-locatable stops in the Central district were made on ether the Putnam Pike or the Douglas Pike. The East district accounted for 26% of them and the West district for 20%. The remaining 3% were made outside the geographic limits of the town.

There were five roadways where at least 100 traffic stops occurred during the study period. These five roadways account for 82% of all traffic stops in town but the Putnam Pike (Route 44), and Douglas Pike (Route 7) were by far the two most active corridors for enforcement. They accounted for 71% of all traffic enforcement. Figure 11.5 illustrates the volume of traffic enforcement that occurred on the each of the five roadways with more than 100 traffic stops.

Figure 11. 5: Traffic Stops by Major Roadway



Route 44 is a major travel corridor that runs for 26 miles through Rhode Island and connects to Connecticut and Massachusetts. Known locally as the Putnam Pike, it runs for approximately 4 miles through the southern part of Smithfield from Glocester to Johnston. Putnam Pike runs through the center Greenville, which is a village of Smithfield. Putnam Pike also has a major junction with I-295 near the border of Johnston. A regional shopping mall, The Crossing at Smithfield, is located at the junction of Putnam Pike and I-295. According to the company website, The Crossing at Smithfield is home to a few nationally recognized retailers including Barnes & Noble, Home Depot, Kohl's, Target, Dick's Sporting Goods, GAP, LOFT, American Eagle Outfitters, and Dave's Fresh Marketplace. The shopping center offers a variety of events including a summer concert series and holiday events. The 2016 average daily traffic counts conducted by the Rhode Island Department of Transportation estimate that approximately 27,000 vehicles a day travel Putnam Pike near the shopping center.

A total of 2,037 traffic stops were made along Putnam Pike during the study year, 48% of all the stops made in the town. Putnam Pike traffic stops included more non-residents than the town as a whole (91%

compared to 87%) and involved equivalent a proportion of black and Hispanic drivers equivalent to the average for the town as a whole. Black drivers accounted for 6.8% of the Putnam Pike stops compared to the town wide average of 6.7% black drivers. Hispanic drivers accounted for 7.6% of the Putnam Pike stops compared to the town wide average of 7.7%. Over 48% of all the Hispanic and black drivers were stopped on Putnam Pike compared to 48% of white drivers stopped there.

Putnam Pike runs through all three patrol districts (west, central, and east), with the largest portion (2.5 miles) running through the western patrol area. Less than one mile of Putnam Pike runs through the central patrol district, which includes The Crossing at Smithfield, and only approximately half a mile is located in the east patrol district, which is directly east of I-295. Of the stops made on Putnam Pike, 39% (791 stops) occurred in the west patrol district, 34% (693 stops) occurred in the central patrol district, and 27% (553) occurred in the east patrol district. However, when the relative lengths of the portions of the Putnam Pike in each district are taken into consideration it becomes clear that the *concentration* of enforcement is by far the densest on the portion located within the East district. Although the 553 stops made in the East district are the fewest of the three segments the density of stops made on this short segment is 60% greater than the Central district segment, and 3.5 times greater than the West district segment of the Putnam Pike.

The percentage of white drivers stopped along Putnam Pike decreased starting from the west patrol district and traveling toward the east patrol district. Over 40% of white drivers stopped on Putnam Pike were stopped in the west patrol district, 33% were stopped in the central patrol district, and 27% were stopped in the east patrol district. However, black and Hispanic drivers stopped on Putnam Pike were more likely to be stopped in the central patrol district than the west or east patrol district (40% of black and Hispanic drivers stopped on Putnam Pike were stopped in the central patrol district.)

Route 7, which in Smithfield is locally known as Douglas Pike, is part of an approximately 16-mile long roadway that begins in Providence at the intersection with Route 246 and heads northwest through North Providence and entering Smithfield at Wenscott Reservoir. Route 7 becomes Douglas Pike in Smithfield and runs for approximately 6 miles northwesterly through the town. The Douglas Pike starts as a two-lane roadway from the border of North Providence and turns into a four-lane roadway just south of the I-295 interchange. At this point the roadway becomes a more commercial corridor with shopping centers and other retail establishments. The Douglas Pike then intersects with Route 116 (George Washington Highway), which is another commercial corridor and continues north past both Bryant University and Fidelity Investments Corporate Offices before it enters North Smithfield. The Douglas Pike continues north into Burrillville where it becomes a local roadway into Massachusetts. Although much of the commercial activity on Douglas Pike is north of the I-295 interchange, there are attractions in both Lincoln and North Providence that generate a lot of traffic along the southern portion of Douglas Pike. The Twin River Casino is located less than two miles east of Douglas Pike in Lincoln, R.I. which is a major traffic generator for the area. Additionally, many night clubs and restaurants are located along the North Providence border that also generate significant traffic along Douglas Pike.

A total of 1,020 traffic stops were made along Douglas Pike during the study year, which was 24% of the total stops made in town. The stops made on Douglas Pike included more non-residents than in the town as a whole (92% compared to 87%) and involved a higher proportion of black and Hispanic drivers compared to the town-wide average. Black drivers accounted for 9.5% of the Douglas Pike stops compared to the town average of 6.7%. Hispanic drivers accounted for 9.3% of the Douglas Pike stops compared to

the town average of 7.7%. Over 31% of Hispanic and black drivers were stopped on Douglas Pike compared to 22% of white drivers stopped there.

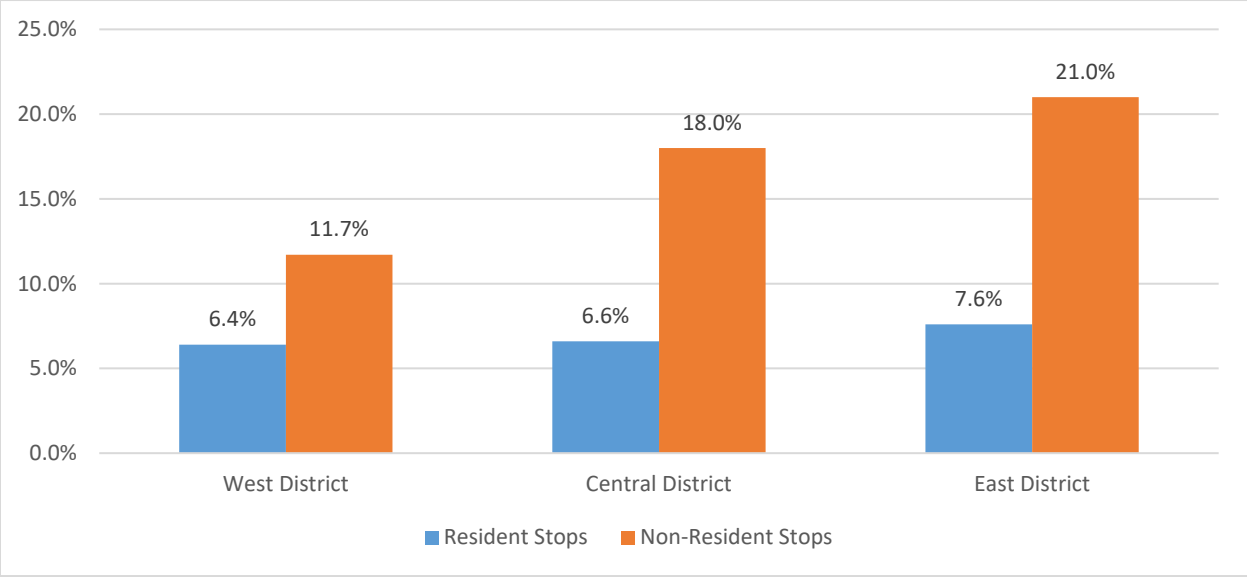
Douglas Pike runs through two of the three patrol districts (central and east), with approximately 2.8 miles in the Central patrol district and 3.3 miles in the East patrol district. Of the stops made on Douglas Pike, 42% (423 stops) occurred in the Central patrol district and 58% (590 stops) occurred in the East patrol district. Like the Putnam Pike, the density of enforcement on the Douglas Pike was approximately 60% greater on a per mile basis on the segment in the East patrol district than it was on the segment in the Central patrol district. Approximately 43% of white drivers stopped on Douglas Pike were stopped in the central patrol district, and 57% were stopped in the east patrol district. In contrast, 35% of black and Hispanic drivers were stopped in the central patrol district and 65% were stopped in the east patrol district.

XI.D: Non-Resident Component of Smithfield Traffic Stops

Smithfield's traffic stop data tends to reflect two basic demographic influences on the driving population: (1) an extremely low non-white driving age resident population and (2) a relatively large proportion of non- residents who make up a significant part of all the people stopped in town. Smithfield's resident driving age population is estimated as 95% white, 1.2% black, 2% Hispanic, and 1.3% Asian/Pacific Islander. The demographics of the Smithfield residents who were stopped during the study year showed only a small disparity for minority drivers (7% of resident drivers stopped were minority compared to the town resident population, which is 5% minority.) The disparity was most significant for non-resident stops. Since 87% of all drivers stopped in Smithfield were not residents, out-of-town drivers clearly have an effect on the stop data.

The racial breakdown of drivers stopped who were not residents was as follows: 83% white, 8.3% Hispanic, 7.3% black, and 1.5% Asian/Pacific Islander. Approximately 95% of the black and Hispanic drivers stopped were not residents, compared to 85% of white drivers and 90.5% of Asian-Pacific Islander drivers. Figure 11.6 shows the percentage of minority resident drivers stopped by patrol area compared to minority non-resident drivers stopped.

Figure 11. 6: Percent Minority Resident Drivers compared to Minority Non-Resident Drivers



While at least 1.5% of the resident driving age population in each if the three patrol districts, is Hispanic, the only significant resident population identified as Black or Asian/Pacific Islander is located in the Central District. As noted in Figure 11.6, the percentage of stopped Minority drivers who were residents of Smithfield was fairly consistent in each of the three districts. The percentage of stopped minority drivers who were not residents of Smithfield varied considerably. Essentially, the prevalence of non-resident stopped minority drivers was highest in the East district, lower in the Central district, and lowest in the West district. Non-resident stopped minority drivers were almost twice as prevalent in the East district as they were in the West district.

Frequently, when a jurisdiction's traffic stop data exhibits both high levels of non-resident minority stops and high levels of traffic enforcement in an area of the town adjacent to a border shared with a community with a more diverse population, the interaction of these factors can have a great deal to do with disparities in the stop data. While North Providence, which borders Smithfield to the South, has a more diverse population that Smithfield, it is not significantly more diverse. North Providence has a 4% black and a 7% Hispanic driving age population compared the Smithfield's 1.2% black and 2% Hispanic driving age population. While the demographic differences between North Providence and Smithfield might very well influence the data, this does not appear to be capable of explaining the stop demographics by itself. It seems at least theoretically likely that a large part of the minority non-resident component of the Smithfield data could be coming from a greater distance away, likely from the City of Providence. Unfortunately, since the Rhode Island traffic stop data we have to analyze cannot differentiate non-residents by community of residence, it is not possible to adequately test this hypothesis. However, there are some factors that seem to support the argument somewhat.

I-295 has two interchanges in Smithfield, one with the Douglas Pike and the other with the Putnam Pike. Both interchanges are essentially at the border between the East and Central districts. Both interchanges are proximate to major traffic generators. In the case of the Putnam Pike, The Crossing at Smithfield regional mall is located adjacent to the exit. The other interchange with the Douglas Pike is just to the

southeast of both Bryant University and Smithfield's largest employer, Fidelity Investments corporate offices.

The two roadways provide primary access from 1-295 to the southeast to Providence via North Providence, as well as access to three of the most significant generators of traffic in the town. The two segments of the Putnam Pike in the East and Central districts, totaling less than 1.5 miles, account for 25% of all the stops made in Smithfield, making them the single most significant enforcement corridor in the town.

XI.E: Special Enforcement Campaigns

Smithfield participated in special enforcement campaigns that were sponsored by the Rhode Island Department of Transportation through funds made available by the National Highway Traffic Safety Administration (NHTSA). Smithfield reported a total of 306 stops as part of the NHTSA-funded campaigns. The Special Enforcement campaigns in which Smithfield participated focused on (1) seatbelt safety ("Click-It or Ticket"), (2) driving while intoxicated (DWI), and (3) Speed enforcement. The Smithfield Police Department was able to identify only the dates, times, and basic stop information for special enforcement campaigns. They provided the locations for all stops during the campaign. The case numbers for each stop were not available to match to the traffic stop database.

Of the 306 stops made as part of the special enforcement campaigns, 142 (46%) were reported as part of the driving while intoxicated campaigns, 87 (28%) were part of "Click-It or Ticket" campaigns, and 77 (25%) were part of the speeding enforcement campaign. Total stops made during special enforcement campaigns accounted for 6% of all stops made in Smithfield during the study period. When a town has participated in these enforcement campaigns and made a significant portion of its total traffic stops as part of them, it can add an additional dimension to analysis of the town's stop data because they can affect the overall data for the town in several ways. For example, stop outcomes for stops made during selective enforcement campaigns can, and usually do, result in a high proportion of penalty outcomes rather than warnings compared to stops made during regular routine patrol activities where officers may have more discretion in deciding whether or not to ticket the violator. Imposition of penalty-based outcomes is one of the tenets for participation in these federally-funded programs. The criteria for selection of locations to conduct selective enforcement could differ in some ways from the way stops are generally conducted. For example, effective speed enforcement requires officers to be able to observe drivers in their vehicles without being observed themselves, which can make some locations for this type of enforcement more suitable than others even though the less suitable locations might have as many drivers potentially violating the targeted laws than the more suitable enforcement locations.

All three campaigns primarily occurred on two major roadways, Douglas Pike and Putnam Pike. These are two of the major thoroughfares in Smithfield, with both significant traffic enforcement activity. The "Click-It-Or-Ticket" campaign included 87 stops, of which 69 occurred on Putnam Pike. The department conducted a total of 142 stops during the "DWI" campaign, of which 74 occurred on Douglas Pike and 45 occurred on Putnam Pike. Finally, there were a total of 77 stops conducted as part of the "Speeding Enforcement" campaign. Of the stops conducted during this campaign, 28 occurred on Douglas Pike and 35 occurred on Putnam Pike.

The distribution of stops made during these special enforcement campaigns reflected to a great degree the distribution of stops made during Smithfield's general enforcement activity, that is, the large majority

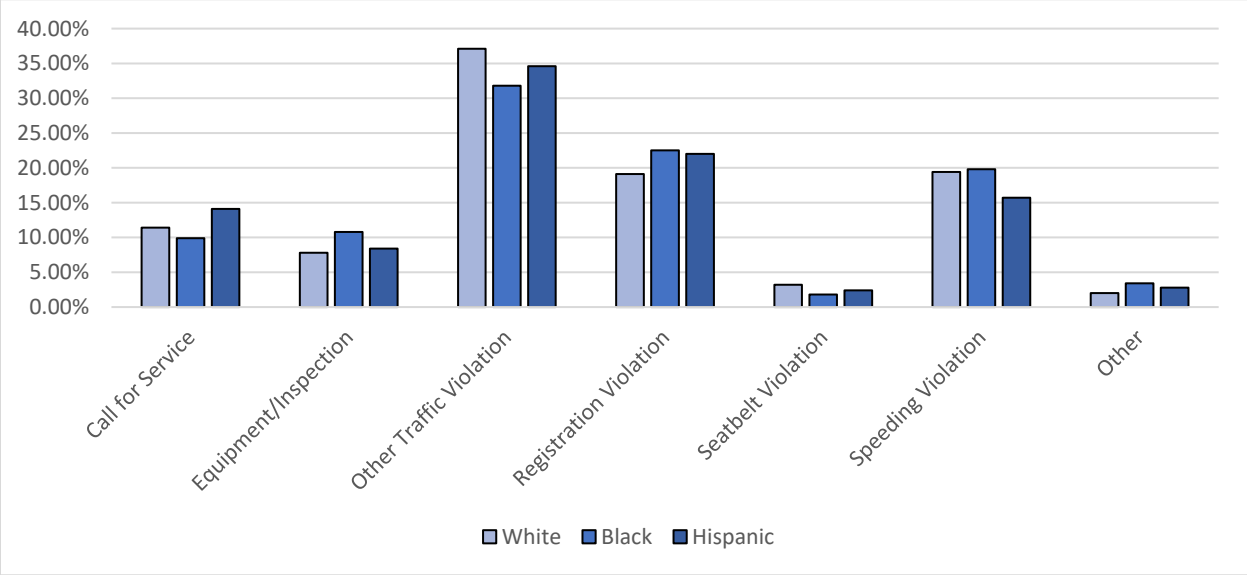
of the stops were made on the same two roads that already have the largest enforcement presence under normal circumstances.

XI.F: Post-Stop Outcome Review

Basis for Stops

The reasons police use to stop a motor vehicle can vary significantly from department to department. The three most common reasons for stopping a motorist reported by officers in Smithfield made up 75% of the total stops. The categories were for "other traffic violations"[19] (37%), registration violations (20%) and speeding violations (19%). 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- and inspection-related violations and registration violations than white drivers as a percentage of their total stops. Hispanic drivers were stopped less frequently for speeding than either white or black drivers, who were roughly equal. Figure 11.7 illustrates by race and ethnicity the reason officers cited to stop a motor vehicle.

Figure 11. 7: Basis for Traffic Stops



Racial and ethnic disparities were most pronounced in equipment/inspection violations, registration violations and speeding violations. The data shows that, with respect to the racial and ethnic demographics of those stopped, both registration violations and equipment- or inspection-related stops 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, either because they live in those areas or are more likely to be traveling in them as opposed to other areas of the town, 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

[19] If a stop was made for a reason other than one of the 11 categories listed as the basis for the stop, it is recorded as "other traffic violation." Some examples of stops that might be recorded as "other traffic violation" include a traffic light violation or stop sign violation but could be any of dozens of other offenses.

with a higher concentration of white drivers, the stop demographics shift toward white drivers, suggesting that the likelihood of finding violators may be more closely related to the locations where the majority of these types of stops are conducted than they may be on inherent violation rates related to race and ethnicity.

Almost 20% (975 stops) of Smithfield's stops were made for registration-related violations and 8% (398) were made for equipment- or inspection-related violations. This was significantly higher than the state average of 8% for registration violations, but lower than the statewide average of 20% for equipment/inspection violations during the study year. Over 42% of all registration-related stops and 35% of equipment and inspection-related stops were made in the Central patrol area. Approximately 50% of all registration and equipment/inspection stops were made on Putnam Pike. This represents a significant focus on these violations along the highest enforcement roadway in town. According to the department, there are a significant number of traffic signals along Putnam Pike, especially near The Crossings at Smithfield. Officers can more easily conduct license plate searches for violations such as expired registration in areas where traffic is slower or more likely to be stopped. It is reasonable that there would be a higher number of registration related stops near the central part of Putnam Pike due to the higher volume of traffic signals in the area.

Of all the Hispanic drivers stopped in Smithfield, 30% were stopped for registration or equipment/inspection violations. In addition, 34% of all the black drivers stopped in the town were pulled over for equipment/inspection or registration related reasons. This compared to 27% of all white drivers stopped for these same types of violations. Conversely, 57% of all the white drivers stopped in town were stopped for hazardous driving behaviors (such as speeding and other traffic violations) compared to 52% of black drivers and 50% of Hispanic drivers.

Speed enforcement was also a significant basis for a traffic stops in Smithfield. There were 961 stops made for speeding or 19% of all stops. However, this was a lower percentage of speed related stops when compared to the statewide average of 30% during the study year. Officers frequently rely on modern technology-based enforcement techniques, like using radar or a laser device, to make speeding stops. Depending on the types of locations and vehicle travel speeds involved, using technology-based enforcement techniques is sometimes considered to be "blind", that is, the officer may have a reduced opportunity to specifically identify driver characteristics before making a decision to act than with other types of violations where a more direct and frequently prolonged observation of the vehicle is made. At least theoretically, if all speeding stops could be considered blind with respect to predetermination of the drivers' racial characteristics, they could possibly provide a useful if clearly imperfect window into the general racial make-up of drivers driving in an enforcement area.

Unfortunately, the data available from Rhode Island does not capture information on technology-based speeding stops. That having been said, we believe it is reasonable to assume that a significant portion of Smithfield's speeding stops were likely technology based and provide the following analysis based on that assumption. The demographics for all speed-related stops in Smithfield were 6.2% Hispanic drivers, 6.9% black drivers, 2.2% Asian and other drivers, and 84.7% white drivers. There was only a slightly higher percentage of white drivers stopped for speed-related violations compared to their overall proportion of all other stops made (84.7% compared to 84%). Black drivers were also stopped at a slightly higher rate for speed-related violations compared to their overall proportion of all other stops made (6.9% compared

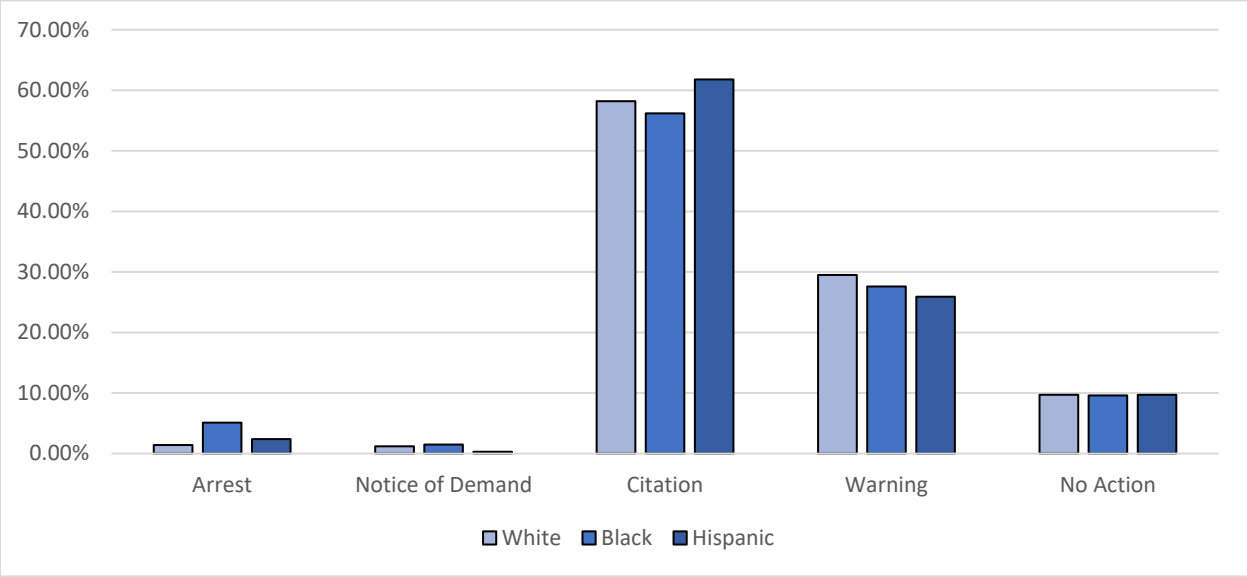
to 6.2%). However, Hispanic drivers were stopped at a lower rate for speed-related violations compared to their overall proportion of all other stops made (6.2% compared to 8.0%).

The largest percentage of speed-related stops (46%) were made in the East patrol area. The demographics for these stops were 8.1% Hispanic drivers, 7.9% black drivers, 2.7% Asian drivers, and 81.2% white drivers. Almost 50% of all speed-related stops were conducted on Douglas Pike, which was a greater concentration of stops than on any other roadways in town. According to the department, speed enforcement is more highly concentrated along the Douglas Pike, particularly south of the I-295 interchange. There are very few traffic signals along the southern portion of the Douglas Pike and the roadway is more residential. Therefore, speeding is a more significant problem that the department focuses on in this area. The demographics for these stops were 7.6% Hispanic drivers, 7.4% black drivers, 3.3% Asian drivers, and 81.7% white drivers. An almost equivalent proportion of drivers across all racial and ethnic groups were stopped for speed-related violations in the East patrol area and on Douglas Pike and for all other stops in those same areas. If, arguably, speeding stops might represent a better proxy of the actual driving population at any given time than all stops considered together, speeding stops may actually have helped to mitigate what could have been a larger disparity in all stops not related to speed. The racial demographics of all speed-related stops in Smithfield more closely mirrored the racial demographics for all stops in town. This could be an indication that police are stopping a representative sample of the actual driving population in town.

Outcome of Stops

The majority of motor vehicle stops in Smithfield resulted in the driver receiving a citation (59%). Black and Hispanic drivers were more likely to be arrested as a percentage of their total stops. Hispanic drivers were also more likely to receive a citation when compared to both black and white drivers. This disparity in stop outcomes for Hispanic drivers is likely correlated to the disparity in stops made for a registration violation. Officers have very little discretion when it comes to issuing a citation for a registration violation. Figure 11.8 shows the outcome of motor vehicle stops by race and ethnicity.

Figure 11. 8: Outcome of Traffic Stop



In Smithfield, 86 of the stops made resulted in the arrest of either the driver or a passenger (1.7%). This was below the statewide average of 3% for stops resulting in an arrest. Of the 86 arrests, the driver of the vehicle was arrested in 83 cases and the passenger was arrested in 3 cases. The racial demographics of individuals arrested as a result of a traffic stop were 69% white, 20% black and 10% Hispanic. When considered as a proportion of their total stops, black drivers were almost 4 times and Hispanic drivers were almost twice as likely to be arrested as a result of the stop as were white drivers (5.1% of all black drivers stopped and 2.4% of all Hispanic drivers stopped compared to 1.3% of all white drivers stopped). The largest number of arrests occurred in the Central patrol area (42%), followed by the East patrol area (37%) and the West patrol area (21%).

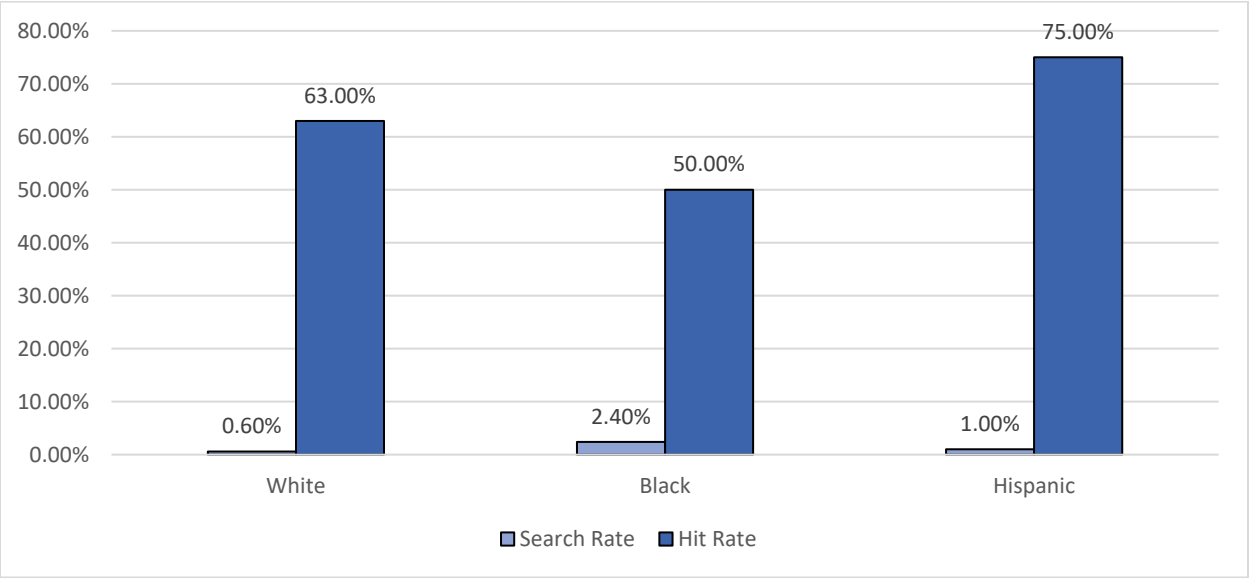
Unfortunately, the available stop data does not identify the reason for the arrest but can only identify why the vehicle was initially stopped. Of the 86 arrests, the basis for stopping a vehicle was "other traffic violation" (40 stops), registration violation (18 stops), speeding (10 stops), call for service (8 stops), or an equipment or inspection violation (7 stops) with the remaining arrests for some other reason (3 stops). The data also indicated 10 of these stops resulted in the vehicle being searched. Stops that were made for what would seem to be more minor traffic-related violations such as equipment or inspection violations, registration violations, speeding and other traffic violations resulted in a significantly higher proportion of minority drivers who were arrested than white drivers arrested. However, it is not possible to determine the reason for the arrest and we must assume that the officer made some additional determination during the stop that a more significant violation had occurred. Unlike many infraction violations, officers have considerably less discretion in the arrest of a person when certain, more serious violations[20] are identified.

Search Information

A review of department search information shows that less than 1% (39) of the drivers stopped in Smithfield were subjected to a motor vehicle search. This rate of motor vehicle searches is significantly lower than the state's 3.8% average. Stops of black drivers resulted in a search at more than four times the rate of white drivers (2.4% black drivers searched compared to 0.6% white drivers). Stops of Hispanic drivers resulted in a search at almost a 60% higher rate than white drivers (1.0% of Hispanic drivers searched compared to 0.6% of white drivers). A search of a motor vehicle is common when a motorist is arrested. Of the 39 motor vehicle searches conducted, 10 resulted in the arrest of a driver or passenger. Although there are disparities in the search rate, the dataset was too small to draw any firm conclusions on their meaning. Search data collected over a longer period of time will have to be examined before any valid conclusions may be drawn on the search rate disparities. Figure 11.9 illustrates the searches and the rate at which contraband was found (the "hit rate").

[20] Most violations of the motor vehicle laws are designated as infractions but some are not. The more serious violations can be reckless driving, operating under a license suspension, operating under the influence of alcohol or drugs, and operating an uninsured or underinsured vehicle.

Figure 11. 9: Search and Hit Rate



XI.G: 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, areas with high accident rates and 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 some of these factors. Basic information on crime, accidents, and other economic factors associated with Smithfield provide a context to potentially explain the rational for police deployments that are important considerations.

The Smithfield police department provided researchers with a summary of dispatch logs or calls for service. which included calls for service and officer-initiated actions that were called in to police dispatch. The logs report approximately 13,000 entries from January 1, 2018 through December 31, 2018, exclusive of traffic stops. The top reasons for calling dispatch were for a business or location check (18%), a response to an alarm (8%) or suspicious activity (5%). These top three reasons account for about 31% of all calls.

Crime data and pattern activity is an integral component of a department's crime control and reduction strategy. Smithfield reported 434 index crimes in 2018, which are eight crimes the FBI combines to produce its annual crime index. The offenses include homicide, forcible rape, robbery, burglary, aggravated assault, larceny over $50, motor vehicle theft, and arson. Of the 434 offenses, 38% (166 offenses) were for larceny, 15% (64 offenses) were for drug violations, 14% (59 offenses) were for assault, 12% (52 offenses) were for destruction of property, and the remaining 21% (93 offenses) were for some other offense.

Taking into consideration the location of Smithfield's overall index crimes in more detail would help to provide a better understanding of what may be leading Smithfield officers to be more active in some areas of the town than in others. We were able to obtain location information for arrests made during the 2018 calendar year in town and believe this will serve as a good proxy for criminal activity. Smithfield reported

606 arrests in 2018. The format of the information allowed us to determine the patrol district where the arrest occurred. Of the 606 arrests, 23% (142 arrests) occurred in the west patrol district, 45% (273 arrests) occurred in the central patrol district, and 31% (191 arrests) occurred in the east patrol district. It is worth noting that the arrests made in the central patrol district appear to have been made primarily in the Smithfield Crossing shopping center or along the Douglas Pike in the area in or around Bryant University. Based on a review of arrest data the Putnam Pike and Douglas Pike areas appear to contribute to the largest number of arrests in town.

Lastly. during our study period there were approximately 906 motor vehicle accidents on roads patrolled by the Smithfield Police Department. The roadways with the highest number of accidents were Putnam Pike (445 accidents), Douglas Pike (174 accidents), Pleasant View Avenue (47 accidents), Cedar Swamp Road (34 accidents), George Washington Highway (28 accidents), and Farnum Pike (25). There were only 6 roads with 25 or more accidents and those roads account for 86% of all accidents in Smithfield. Putnam Pike accounts for 49% of all accidents and Douglas Pike accounts for 19% of all accidents in town.

XI.H: Summary of Findings

The Smithfield Police Department identified factors they believe contributed to the disparity identified in the initial analysis of traffic stops. In particular, the department identified the Putnam Pike and Douglas Pike as major traffic generators for the town. The Putnam Pike is a major corridor that runs through the southern portion of town. This route runs for 26 miles through Rhode Island connecting Connecticut and Massachusetts. Douglas Pike runs from the central northern part of town through the southeastern part of town. The central portion of Douglas Pike in Smithfield is a four-lane corridor with large commercial activity. The southern and northern portions of the roadway pass through heavily wooded areas and thin to a two-lane roadway. Douglas Pike acts as a major thoroughfare into and out of the city of Providence. Smithfield also hosts Bryant University, a private four-year college with approximately 3,500 undergraduate students and less than 300 graduate students. Bryant is located on over 400 acres of land right off Douglas Pike in the northern part of town, near the border with North Smithfield. Across the street from Bryant University is the towns largest employer with approximately 3,300 employees, Fidelity Investments. Fidelity Investments corporate offices are located directly across Douglas Pike from Bryant University. Commercial activity is in close proximity to this part of town. Putnam Pike and Douglas Pike were by far the two most active corridors for enforcement and accounted for 71% of all traffic enforcement.

Putnam Pike is the busiest roadway in town and accounts for the largest percentage of traffic stops (48%). The route runs through all three patrol districts (west, central, and east), with the largest portion (2.5 miles) running through the western patrol area. Less than one mile of Putnam Pike runs through the central patrol district, which includes The Crossings at Smithfield, and only approximately half a mile is located in the east patrol district, which is directly east of I-295. When the relative lengths of the portions of Putnam Pike in each district are taken into consideration it becomes clear that the concentration of enforcement is by far the densest on the portion located within the East district. Although the stops made in the East district are the fewest of the three segments the density of stops made on this short segment is 60% greater than the Central district segment, and 3.5 times greater than the West district segment of the Putnam Pike. The two segments of the Putnam Pike in the East and Central districts, totaling less than 1.5 miles, account for 25% of all the stops made in Smithfield, making them the single most significant enforcement corridor in the town. The percentage of white drivers stopped along Putnam Pike decreased

starting from the west patrol district and traveling toward the east patrol district. Black and Hispanic drivers stopped on Putnam Pike were more likely to be stopped in the central patrol district than the west or east patrol district.

Douglas Pike is the second busiest roadway in town and accounts for 24% of traffic stops made in town. The corridor also involved a higher proportion of black and Hispanic drivers compared to the town-wide average. Over 31% of black and Hispanic drivers were stopped on the Douglas Pike compared to 22% of white drivers. The route runs through two of the three patrol districts (central and east), with approximately 2.8 miles in the Central district and 3.3 miles in the East district. Like Putnam Pike, the density of enforcement on Douglas Pike was approximately 60% greater on a per mile basis on the segment in the East patrol district. A larger percentage of black and Hispanic drivers were stopped on Douglas Pike in the East patrol district than the Central patrol district.

Smithfield's traffic stop data also reflects an extremely low non-white driving age resident population and a relatively large proportion of non-residents who make up a significant part of all the people stopped in town. Since 87% of all drivers stopped in Smithfield were non-residents, the overall impact out-of-town drivers had on the stop data is fairly clear. Approximately 95% of black and Hispanic drivers stopped were not residents, compared to 85% of white drivers who were non-residents. The percentage of stopped minority drivers who were not residents of Smithfield varied considerably by patrol district. The prevalence of non-resident stopped minority drivers was highest in the East district, lower in the Central district, and lowest in the West district. Non-resident stopped minority drivers were almost twice as prevalent in the East district as they were in the West district. It is likely that a large part of the minority non-resident component of the Smithfield data could be using I-295 and coming through the town from Providence. I-295 has two interchanges in Smithfield, one with the Douglas Pike and the other with Putnam Pike. These two roadways provide primary access from I-295 to the southeast to Providence as well as access to three significant traffic generators in town (The Crossings as Smithfield, Bryant University, and Fidelity Investments).

Traffic Stop Outcomes

In Smithfield, the three most common reasons used for stopping a motorist make up 75% of the total stops. The three largest stop categories were for "other traffic violation" (37%), registration violations (20%), and speeding violations (19%). 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- and inspection-related violations and registration violations than white drivers as a percentage of their total stops. Hispanic drivers were stopped less frequently for speeding than either white or black drivers, who were roughly equal.

Racial and ethnic disparities were most pronounced in equipment/inspection violations, registration violations and speeding violations. Over 30% of Hispanic drivers and 34% of black drivers were stopped for registration or equipment/ inspection violations compared to 27% of white drivers. Conversely, 57% of all the white drivers stopped in town were stopped for hazardous driving behaviors (such as speeding and other traffic violations) compared to 52% of black drivers and 50% of Hispanic drivers. The data shows that, with respect to the racial and ethnic demographics of those stopped, both registration violations and equipment- or inspection-related stops are closely related to the frequency and location of where the stops are made. Over 42% of all registration-related stops and 35% of equipment and inspection-related stops were made in the Central patrol area. Approximately 50% of all registration and

equipment/inspection stops were made on Putnam Pike. This represents a significant focus on these violations along the highest enforcement roadway in town. The frequency and location of these stops on the high enforcement roadway, with a large percentage of non-resident minority drivers traversing them, appears to have been an important factor in the Smithfield disparity involving black and Hispanic drivers.

Speed enforcement was also a significant basis for a traffic stops and accounted for 19% of all stops. Officers frequently rely on modern technology-based enforcement techniques, like using radar or a laser device, to make speeding stops. Using technology-based enforcement techniques is sometimes considered to be "blind", that is, the officer may have a reduced opportunity to specifically identify driver characteristics before deciding to stop a vehicle. The largest percentage of speed-related stops (46%) were made in the East patrol area. The demographics for these stops were 8.1% Hispanic drivers, 7.9% black drivers, 2.7% Asian drivers, and 81.2% white drivers. Almost 50% of all speed-related stops were conducted on Douglas Pike, which was a greater concentration of stops than on any other roadways in town. The demographics for these stops were 7.6% Hispanic drivers, 7.4% black drivers, 3.3% Asian drivers, and 81.7% white drivers. An almost equivalent proportion of drivers across all racial and ethnic groups were stopped for speed-related violations in the East patrol area and on Douglas Pike and for all other stops in those same areas. If, arguably, speeding stops might represent a better proxy of the actual driving population at any given time than all stops considered together, speeding stops may have helped to mitigate what could have been a larger disparity in all stops not related to speed.

Regarding stop outcomes, the majority of vehicle stops in Smithfield resulted in the driver receiving a citation. Black and Hispanic drivers were more likely to be arrested as a percentage of their total stops. Hispanic drivers were also more likely to receive a citation when compared to both black and white drivers. This is likely due to the disparity found in registration violations where officers have very little discretion when it comes to issuing a citation for a registration violation. When considered as a proportion of their total stops, black drivers were almost 4 times and Hispanic drivers were almost twice as likely to be arrested as a result of a stop as were white drivers. The racial demographics of the individuals arrested as a result of a traffic stop were 69% white, 20% black, and 10% Hispanic. The largest number of arrests occurred in the Central patrol area (42%). Unfortunately, it is not possible to determine the reason for an arrest, but presumably the officer made some additional determination beyond the reason for the stop that an offense occurred warranting an arrest.

Smithfield police searched fewer than 1% of the drivers they stopped, which was below the state average of 3.8%. Black and Hispanic drivers were searched at a higher rate than white drivers were. Contraband was found after a search at a higher rate for white and Hispanic drivers. Given the relatively small number of searches conducted, these differences are not significant.

Conclusion

Taken as a whole, the Smithfield traffic stop data reflects the influence of the Putnam Pike and Douglas Pike corridors that appear to be somewhat more diverse than the predominantly white resident driving age population. These roads appear to have a relatively high level of enforcement and a relatively higher proportion of non-resident minority drivers traveling them. Both corridors are major traffic generators for the town with areas that have large commercial activity such as Bryant University, Fidelity Investments and The Crossings at Smithfield.

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- and inspection-related violations and registration violations than white drivers as a percentage of their total stops. Hispanic drivers were stopped less frequently for speeding than either white or black drivers, who were roughly equal. Our analysis indicates that this difference could be due more to the greater frequency with which these stops were made in high enforcement corridors, where minority drivers are more likely to be among the driving population.

After a full review, the disparities do not appear excessive in nature, but the department would benefit from a periodic review of traffic enforcement policies as they relate to enforcement activity particularly on Putnam Pike and Douglas Pike in order to evaluate the extent to which they may have a disproportionate impact on minority drivers.

XII: WARWICK 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 researchers conduct an in-depth analysis for the Warwick Police Department.

According to the results from the "Solar Visibility" analysis, the Warwick Police Department indicated a statistically significant disparity in the rate that both black and Hispanic motorists were stopped during daylight relative to darkness. Within the inter-twilight window, the odds that a stopped motorist was black and Hispanic increased by 1.9 and 1.8 respectively during daylight relative to darkness. The results were statistically significant at a level greater than 99 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 2018 calendar year, the Westerly Police Department made 14,807 traffic stops. Of these, 20% were minority stops (9% Hispanic and 9% black). Table 12.1 below compares summary racial data for reported traffic stops in Warwick over a three-year period.

Table 12. 1: Warwick Traffic Stops – 2016 - 2018

	2016 Stops		2017 Stops		2018 Stops	
White	11,693	82.9%	9,943	82.7%	11,792	79.6%
Black	993	7.0%	916	7.6%	1,343	9.1%
Asian	258	1.8%	216	1.8%	269	1.8%
NA*	17	0.1%	8	0.1%	14	0.1%
Hispanic	1,143	8.1%	936	7.8%	1,389	9.4%
Total	**14,104**		**12,019**		**14,807**	

*Native American

XII.A: Descriptive Analysis of the 2018 Traffic Stop Data

Researchers studied the racial and ethnic disparities in the Warwick Police Department data using a more detailed review of traffic enforcement during the study period. Part of the analysis involved reviewing the detailed location descriptions provided by the department and any enhancement we were able to make. Warwick officers record the location of a traffic stop by patrol posts. The town is divided into 16 patrol posts and an airport post. Although we are unable to determine the specific street location of each stop, the patrol posts provide us with enough information to assess the differences in areas within the town.

According to the 2010 census, Warwick is a city with approximately 68,876 residents over the age of 16. Approximately 8% of the driving age population in Warwick is identified as a minority. Table 12.2 outlines the basic demographic information for Warwick residents over age 16.

Table 12. 2: Warwick Population

Race/Ethnicity	16+ Population Total	% Population Total
White Non-Hispanic	63,476	92.2%
Black Non-Hispanic	987	1.4%
AsPac Non-Hispanic	1,431	2.1%
Hispanic	1,904	2.8%
Other	1,078	1.5%
Total	**68,876**	

Warwick is the second most populous city in Rhode Island and is located approximately 12 miles south of downtown Providence. Warwick is approximately 50 square miles, of which 36 square miles is land and 14 square miles is water. Greenwich Bay is to the south of Warwick and the Providence River is to the eastern border of the city. There are approximately 39 miles of coastline in Warwick. Two other municipalities border Warwick: Cranston to the northwest and West Warwick to the West. Cranston is the third most populous city in Rhode Island and has a more diverse resident population when compared to Warwick (79% white population compared to 92% white population.) West Warwick is a predominately white demographic, with a white driving age population of 91%. Of the drivers stopped in the city, only 40% were residents of Warwick Therefore, the city is significantly impacted by traffic from other communities.

Several major roadways and highway corridors run through Warwick and impact traffic enforcement. Those roadways include Interstate 95 (I-95), Interstate 295 (I-295), Route 1, T.F. Green Airport Connector Road, Route 37 (Lincoln Avenue Freeway), and Route 2. Many of these corridors act as major arteries within Warwick connecting Providence and Cranston. I-95 runs from the southwest border of Warwick north past the T.F. Green Airport Connector and Route 37 where it crosses into Cranston. I-295 starts in Warwick at a complex interchange that involves access between I-95, I-295, and Route 113. After the interchange the highway crosses the Pawtucket River, passes the Warwick Mall and crosses over Route 2 into Cranston. The highway forms a western beltway around Providence.

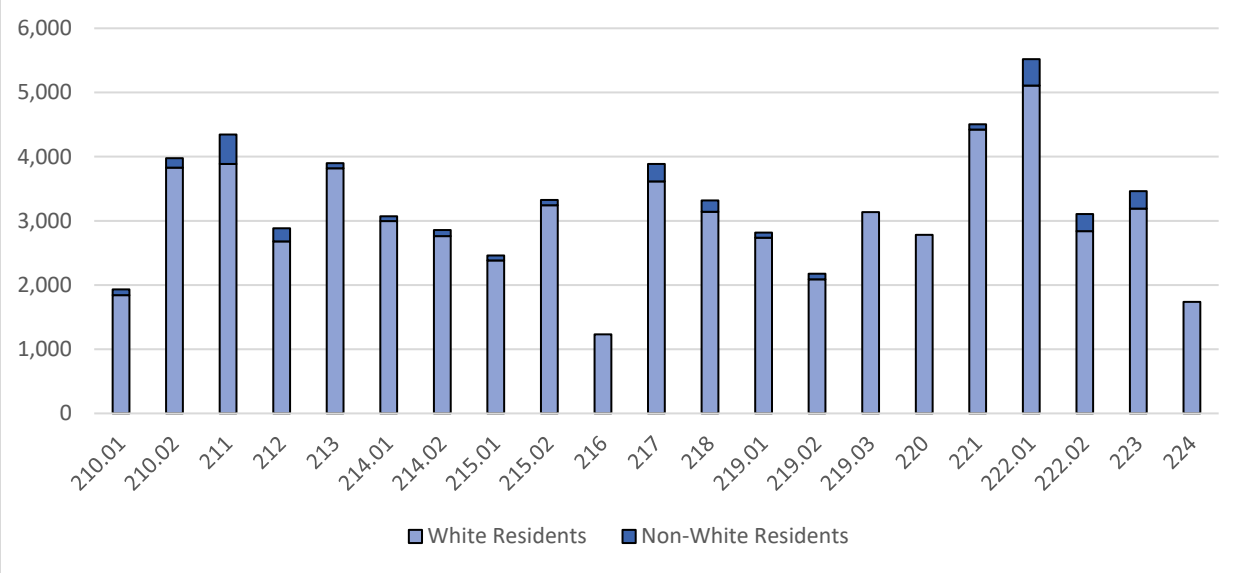
Route 1 begins at the East Greenwich border at the intersection with Division Street and runs north parallel with I-95. Route 1 crosses into Cranston as it passes the Pawtucket River near 1st Avenue. The T.F. Green Airport Connector runs between I-95 around exit 13 and is a major route into the airport. Route 2 acts as the border between Warwick and West Warwick from the exit 8 interchange with I-95 to Bald Hill Road where it heads northeast past I-295 and crosses into Cranston shortly after the Warwick Mall. Finally, R.I. Route 37 (also known as the Lincoln Avenue Freeway) is a 3.5-mile state highway that serves the cities of Cranston and Warwick. The highway links the T.F. Green Airport in Warwick to I-295. Route 37 has three major interchanges starting with I-295 in Cranston, Route 2 in Cranston, and I-95 in Warwick. Route 37 serves as a major east-west freeway in the Providence metropolitan area as well as a route to the airport

Traffic enforcement is primarily the responsibility of the Patrol and Traffic Divisions. The Patrol Division is divided into three Platoon's. The first platoon is made up of 20 officers and five sergeants, the second platoon is made up of 24 officers and six sergeants, and the third platoon is made up of 16 officers and five sergeants. Warwick also has a Traffic Unit, which consists of six officers and one sergeant. According to the department, the Traffic Unit conducted about 13% of the total traffic stops during the 2018 calendar year. The city is divided into three patrol districts and officers are assigned to beats which are evenly

distributed throughout the city to best handle call volume within an area. It is also worth noting that police administrators, and specialized units are assigned to work during different shifts and days of the week depending on the unit's primary purpose and need.

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 Warwick into 22 census tracts. Although census tract 9800 is the T.F. Green Airport and has no population. The resident driving age population in each census tract varies from about 1,200 to about 5,500 people, with the largest concentration (8% of the total population) in tract 222.01. Figure 12.1 shows the distribution for each census tract in terms of white and non-white driving age populations.

Figure 12. 1: Age 16 and Older Resident Population by Census Tract



The location of traffic stops in Warwick are recorded in three different ways: (1) by patrol district, (2) by patrol post, and (3) by the land area labeled within a city plat map. The patrol districts are the easiest to understand, but also cover the largest land area. Warwick is broken into three patrol districts and officers are assigned to each district. District 1 is the north eastern portion of the city, District 2 is the south eastern portion of the city, and District 3 is the western half of the city. The city is also divided by sixteen patrol posts and the airport. Of the 16 patrol posts, six make up District 1 (posts 5, 8, 9, 10, 11, and 15), five make up District 2 (posts 2, 3, 4, 6, and 7), and five make up District 3 (posts 1, 12, 13, 14, and 16). The final manner that traffic stops are recorded by is the number associated with the city assessor's plat map. A plat map, also known as a "plat", shows you how a tract of land is divided into lots. It is usually drawn to scale and records land size, boundary locations, and nearby streets, among other things. For our purposes it is essentially a neighborhood map and a good way to drill down on specific locations within the city. Warwick is divided into 185 plat areas and a review of location data by plat areas will be discussed later in this report.

Figure 12.2 illustrated the volume of traffic enforcement that occurs in each of the three patrol districts. Traffic enforcement appears to be more highly concentrated in District 1 and District 3. District 1 covers the airport and area around the airport as well as a large portion of the Cranston border. District 3 covers the eastern portion of Warwick including most of I-95, the I-295 interchange, and the Warwick Mall.

District 1 accounts for 45% of all traffic stops, District 2 accounts for 22% of all traffic stops, and District 3 accounts for 33% of all traffic stops. The largest number of minority drivers were stopped in District 1, which accounted for 56% of all minority drivers stopped during the study year.

Figure 12. 2: Traffic Stops by Patrol Beat

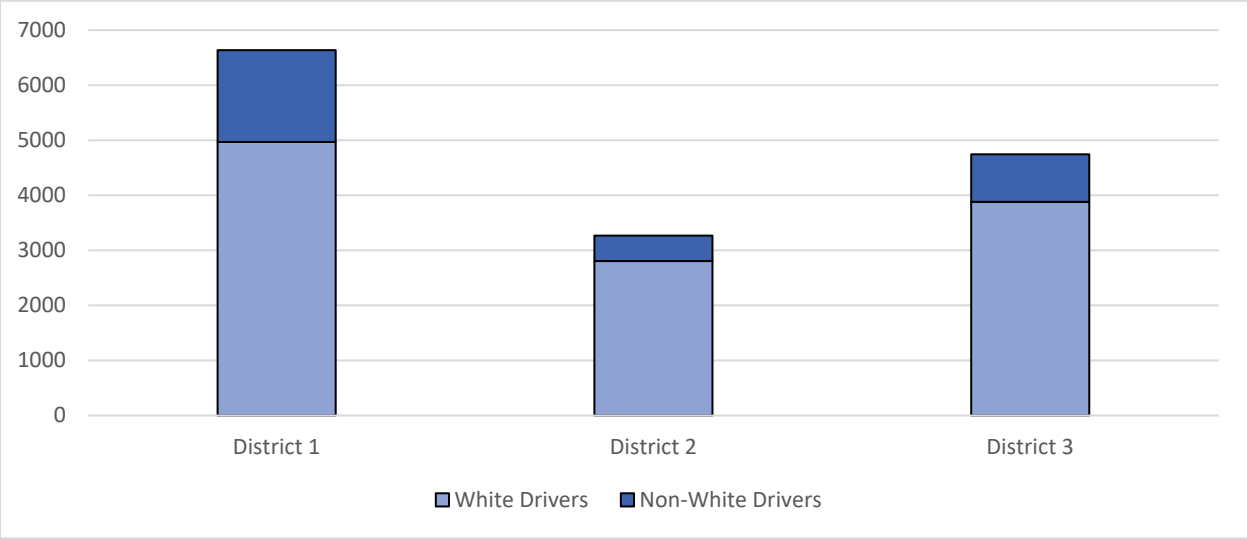
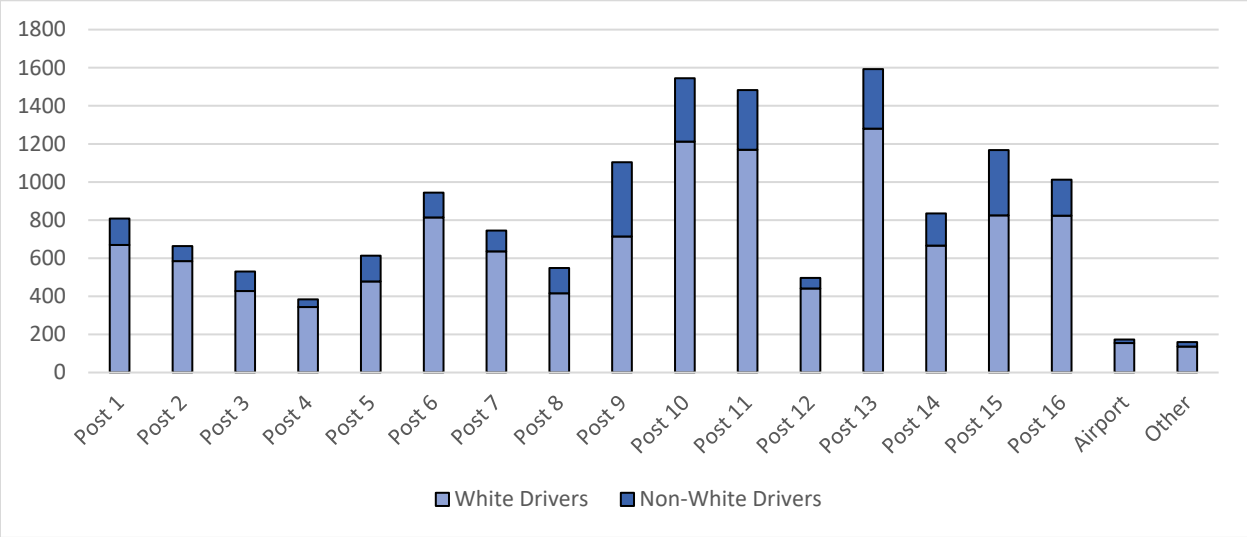


Figure 12.3 illustrates the volume of traffic enforcement that occurs in each of the 17 patrol areas. Traffic enforcement appears to be more highly concentrated in the patrol areas closest to the airport and along the Post Road. The patrol posts with the highest levels of enforcement include posts 9, 10, 11, 13, and 15. All five of these patrol posts account for 47% of all traffic enforcement in the city. In these five patrol areas the stop demographics included 25% minority drivers and 75% white drivers. The largest number of minority drivers were stopped these five patrol areas, which account for 56% of all minority drivers stopped during the study year.

Figure 12. 3: Traffic Stops by Patrol Beat

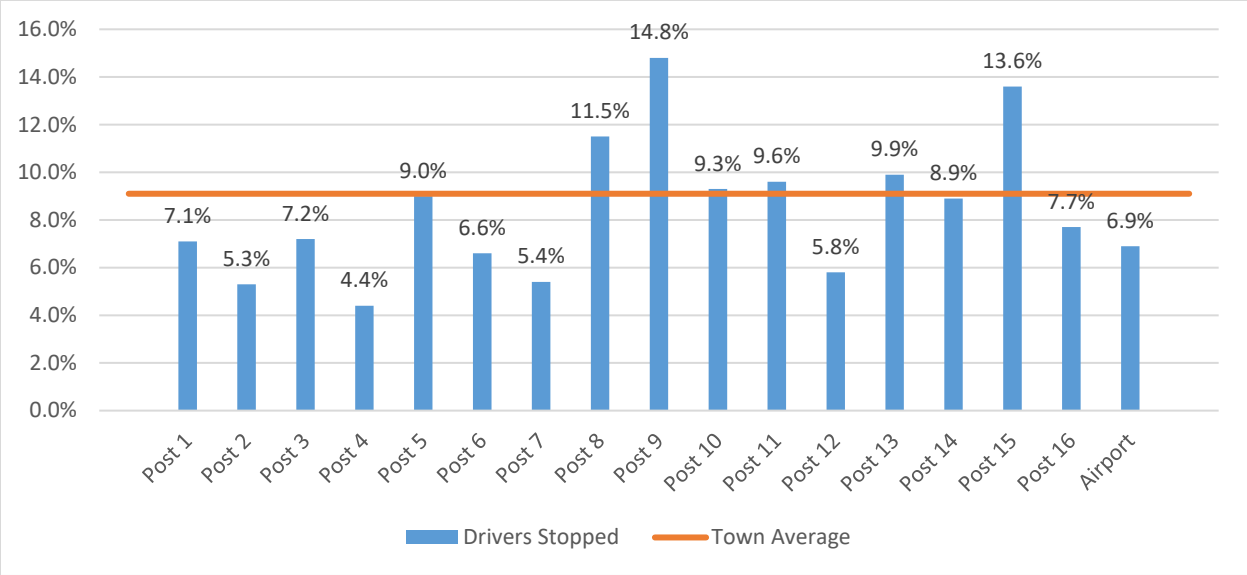


XII.B: Traffic Stop Breakdown by Race/Ethnicity

In Warwick, 20% of all drivers stopped were minority drivers, classified as all non-white drivers, but predominantly black or Hispanic drivers. Black non-Hispanic drivers comprised 9% of all drivers stopped in Warwick, Hispanic drivers 9%, White non-Hispanic drivers 80%, and 2% were drivers of other races. Warwick's resident driving age population is 8% minority (1.4% black non-Hispanic, 2.8% Hispanic, 2.1% Asian/Pacific Islander, and 1.5% other races). If compared directly, these sets of figures could suggest the presence of a disparity with respect to minority drivers, but other factors must be considered before drawing such a conclusion and the disparate effect varies based on the racial and ethnic makeup of the different patrol areas of Warwick.

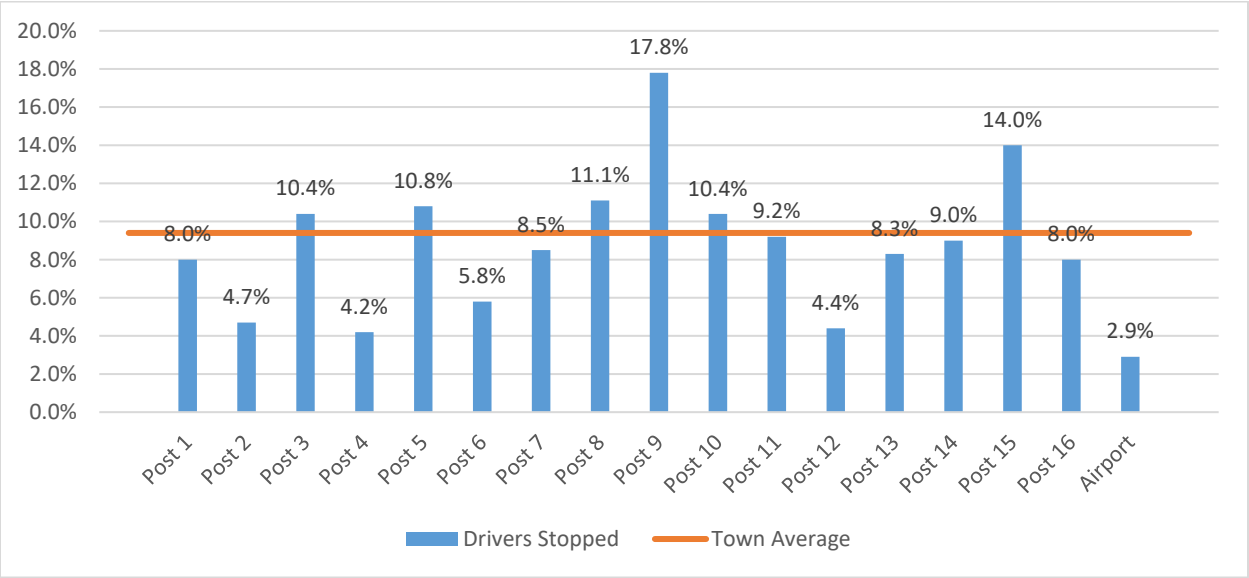
The overall percentage of Warwick traffic stops involving black drivers was 9%. The town average of 9% of black drivers stopped was exceeded in six of the 17 patrol posts. Of the six patrol posts that exceed the town average, posts 8, 9, 13, and 15 border the city of Cranston, which is more diverse than the city of Warwick with a 5% black population. Patrol posts 10 and 11, which have some of the highest levels of enforcement in the city, are located near the airport and along the Route 1 corridor. These six patrol areas account for 62% of where all black drivers were stopped. It is worth noting that 80% of all black drivers stopped in Warwick were not residents of the city. Figure 12.4 shows the difference between the black drivers stopped by zone and the town average.

Figure 12. 4: Black Drivers Stopped Compared to Town Average



The overall percentage of traffic stops involving Hispanic drivers was 9.4%. The percentage of Hispanic drivers stopped exceeded the town average of 9.4% in six of the 17 patrol areas (Posts 3, 5, 8, 9, 10, and 15). Patrol posts 8, 9, and 15 border the city of Cranston, which is more diverse than the city of Warwick with a 9% Hispanic population. Post 3 is the Oakland Beach section of the city, Post 5 is in the center of the city along the Providence River, and post 10 is located just north of the Airport. These six patrol posts that exceeded the town average accounted for 51% of all Hispanic stops during the study year. As with black drivers, it is noteworthy that 84% of all Hispanic drivers stopped in Warwick were not residents of the city. Figure 12.5 shows the difference between the Hispanic drivers stopped by patrol area and the town average.

Figure 12. 5: Hispanic Drivers Stopped Compared to Town Average



XII.C: "Plat" or Neighborhood Area Analysis

As we mentioned previously, the location of traffic stops in Warwick are recorded in three different ways. The method that provides the most detailed understanding of stop locations is by the land area labeled within a city plat map. Traffic stops are recorded by a number associated with the city assessor's plat map. A plat map, also known as a "plat", shows you how a tract of land is divided into lots. It is usually drawn to scale and records land size, boundary locations, and nearby streets, among other things. For our purposes it is essentially a neighborhood map and a good way to drill down on specific locations within the city. Warwick is divided into 185 plat areas. Although there are too many neighborhoods that make up the city of Warwick to visualize in a chart, there are a small number of neighborhood areas that make-up a larger percentage of where traffic stops occur. Of the 185 "plats" where traffic stops were reported, only 56 had more than 100 stops. The 56 plats with more than 100 stops accounted for 73% of all traffic stops in Warwick. Upon review of these 56 plat areas it became clear that there are four high enforcement areas in the city, which are discussed below.

The Post Road and Jefferson Boulevard corridors from Veterans Memorial Drive north to the Cranston border are a high enforcement patrol area in Warwick. There are 14 plat areas in this corridor where 2,706 traffic stops were conducted, which accounts for 20% of all traffic enforcement in the city. According to Rhode Island Department of Transportation average daily traffic counts there are approximately 38,000 cars a day along the Post Road between Main Avenue and Airport Road. Additionally, there are approximately 30,000 cars a day traveling along Jefferson Boulevard between the T.F. Green Connector and Route 37. Although we don't know the exact location of any traffic stop, we assume that the high traffic volume on both the Post Road and Jefferson Boulevard make it more likely that traffic stops were conducted on those major thoroughfares. The racial breakdown of drivers stopped in this area were 76% white drivers, 10% black drivers, 11% Hispanic drivers, and 3% other drivers. There were a higher percentage of both black and Hispanic drivers stopped along these corridors than the city.

Although it is a small geographic area within the city, the area between Toll Gate Road and East Avenue as well as the area between I-295 and Bald Hill Road make-up a high enforcement traffic area. This high

traffic enforcement area includes the complex interchange between I-95, I-295, and East Avenue. Additionally, the section of Bald Hill Road is a high commercial activity corridor that leads to the Warwick Mall. The Community College of Rhode Island, Knights Campus, Toll Gate High School, and Kent Hospital are all located in this high activity area. This area is primarily located in patrol post 13 and with six plat areas. There were 1,650 traffic stops were conducted in these six plat areas, accounting for 11% of all traffic enforcement in the city. Two plat areas adjacent to each other (Plats 259 and 260) had the highest volume of traffic stops of any plat areas within Warwick. There were 566 stops conducted in Plat 259 and 529 stops conducted in Plat 260, which accounted for 7% of all traffic stops. The racial breakdown of drivers stopped in this area were 82% white drivers, 9% black drivers, 7% Hispanic drivers, and 2% other drivers. The demographics of drivers stopped in this area mirrored the city average for black drivers but was lower for Hispanic drivers.

Airport Road is another high enforcement corridor, which is approximately 1.5 miles long between the Post Road and Warwick Avenue on the north side of the airport. There are 5 plat areas in this corridor where 1,411 traffic stops were conducted, which accounts for 9.5% of all traffic enforcement in the city. According to the Rhode Island Department of Transportation average daily traffic counts, there are approximately 28,000 cars a day that travel along Airport Road. Although we don't know the exact location of traffic stops within these five plat areas, this is the only roadways with significant traffic volume. Therefore, it is likely that a majority of these stops are made along Airport Road. The racial breakdown of drivers stopped in this area were 81% white drivers, 8% black drivers, 9.5% Hispanic drivers, and 1.5% other drivers. The demographics of drivers stopped in this area mirrored the city average for Hispanic drivers but was lower for black drivers.

The final high enforcement area within the city is primarily located within patrol post 6 and 3 along three main corridors, (1) West Shore Road between Sandy Lane and Oakland Beach Avenue, (2) Sandy Lane between West Shore Road and Warwick Avenue, and (3) Oakland Beach Avenue between Sandy Lane and Suburban Parkway. There are six plat areas in this corridor where 1,059 traffic stops were conducted, which accounts for 7% of all traffic enforcement in the city. According to the Rhode Island Department of Transportation average daily traffic counts, there are approximately 27,000 cars a day that travel along West Shore Road and approximately 20,000 cars a day that travel along Oakland Beach Avenue. Although we don't know the exact location of traffic stops within these five plat areas, these three corridors are the roadways with the most significant traffic volume. Therefore, it is likely that most of these stops are made along one of these three roads. The racial breakdown of drivers stopped in this area were 84% white drivers, 7% black drivers, 8% Hispanic drivers, and 1% other drivers. There were fewer minority drivers stopped in this section of the city than the other high enforcement areas.

XII.D: Non-Resident Component of Warwick Traffic Stops

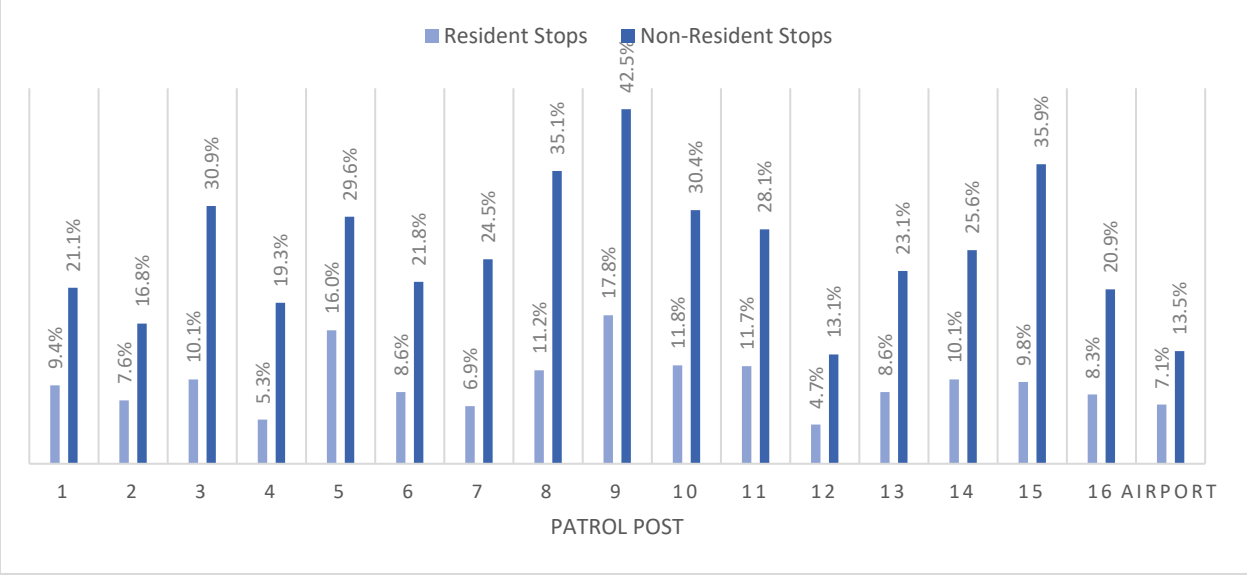
The resident driver component of the Warwick traffic stop data was one of the highest for any Rhode Island municipality and well below the state average. The average non-resident component for all 37 Rhode Island municipalities was 73.5%. Warwick's non-resident component was 60%. Thus. while Warwick's data exhibits a significant non-resident driver influence it seems to be less than many other Rhode Island towns.

That being said, Warwick's traffic stop data tended to reflect two basic influences: (1) an extremely low non-white driving age resident population and (2) a relatively large proportion of non- residents who make up the majority of people who were stopped in the city. Warwick's resident driving age population is

estimated as 92% white, 1.4% black, 2.8% Hispanic, 2.1% Asian/Pacific Islander, and 1.5% some other race. The demographics of the Warwick residents who were stopped during the study year showed a disparity for both black and Hispanic drivers. The racial breakdown of drivers stopped who were residents were as follows: 89.7% white, 3.9% Hispanic, 4.7% black, and 1.7% other. The disparity was most significant for non-resident stops. Since 60% of all drivers stopped in Warwick were not residents, out-of-town drivers clearly had an impact on the stop data.

The racial breakdown of drivers stopped who were not residents were as follows: 73% white, 13% Hispanic, 12% black, and 2% Asian/Pacific Islander. In comparison to stop demographics (including both residents and non-residents), the overall effect of non-resident minority drivers stopped is fairly clear, though it is more significant in some patrol areas more than others. Non-resident drivers were less white (73% compared to 80%,), more black (12% compared to 9%), more Hispanic (13% compared to 9%), and only slightly more Asian/Pacific Islander (2% compared to 1.8%). The combined percentages for all non-resident minority drivers was 27% compared to 20% for all stops. Approximately 80% of black drivers and 84% of Hispanic drivers stopped were not residents, compared to 56% of white drivers. Figure 12.6 shows the percentage of minority resident drivers stopped compared to minority non-resident drivers stopped by patrol post.

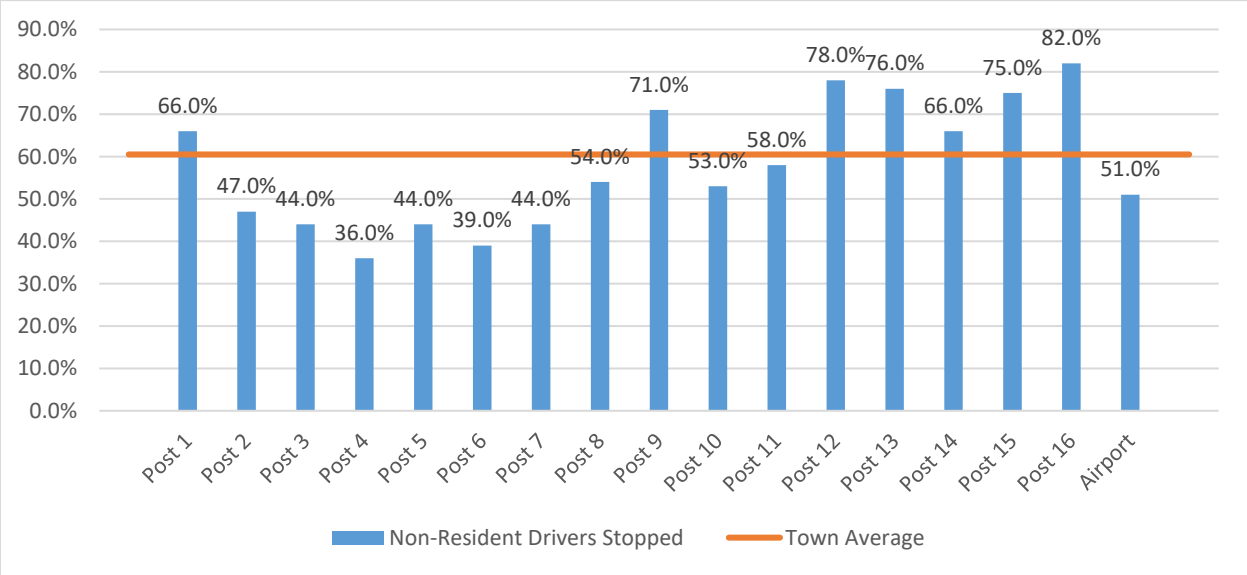
Figure 12. 6: Percent of Minority Resident Drivers compared to Minority Non-Resident Drivers



Our examination of all 16 Warwick patrol districts identifies several districts where the non-resident effect may be the most pronounced. Seven of the 16 patrol posts (posts 1, 9, 12, 13, 14, 15, and 16) are largely influenced by out-of-town traffic. All seven of these patrol posts are located on the western side of Route 1, and include Route 1, most of the T.F. Green Connector, the I-95 and I-295 interchange, Route 37, and Jefferson Boulevard. These are all high enforcement and high traffic volume roadways in town, and many serve as major thoroughfares to the state's largest airport. On average, 74% of all drivers stopped in the seven high enforcement patrol areas were not residents of Warwick. More specifically, non-resident minority drivers were stopped in these areas at a higher rate than non-resident white drivers (88% of

minority drivers stopped were non-residents compared to 69% of white drivers.) Figure 12.7 shows the difference between non-resident drivers stopped by patrol area and the town average.

Figure 12. 7: Non-Resident Drivers Stopped Compared to Town Average



XII.E: Special Enforcement Campaigns

Warwick participated in special enforcement campaigns that were sponsored by the Rhode Island Department of Transportation through funds made available by the National Highway Traffic Safety Administration (NHTSA). Warwick reported a total of 2,277 stops as part of the NHTSA-funded campaigns. The Special Enforcement campaigns in which Warwick participated focused on (1) seatbelt safety ("Click-It or Ticket"), (2) driving while intoxicated (DWI), (3) Speed enforcement and (4) distracted driving. The Warwick Police Department was able to identify only the dates, times, and basic stop information for special enforcement campaigns. The case numbers for each stop were not available to match to the traffic stop database.

Of the 2,277 stops made as part of the special enforcement campaigns, 365 (16%) were reported as part of the driving while intoxicated campaigns, 665 (29%) were part of "Click-It or Ticket" campaigns, 971 (43%) were part of the speeding enforcement campaign, and 276 (12%) were part of a distracted driving campaign. Total stops made during special enforcement campaigns accounted for only 15% of all stops made in Warwick during the study period. Warwick participate in NHTSA funded campaigns throughout the entire year, but May and August appeared to have the highest volume of stops as part of the campaigns. This is primarily due to the increase in "Click-it or Ticket" campaign stops that occurred during those two months.

When a town has participated in these enforcement campaigns and made a significant portion of its total traffic stops as part of them, it can add an additional dimension to analysis of the town's stop data because they can affect the overall data for the town in several ways. For example, stop outcomes for stops made during selective enforcement campaigns can, and usually do, result in a high proportion of penalty outcomes rather than warnings compared to stops made during regular routine patrol activities where officers may have more discretion in deciding whether or not to ticket the violator. Imposition of penalty-

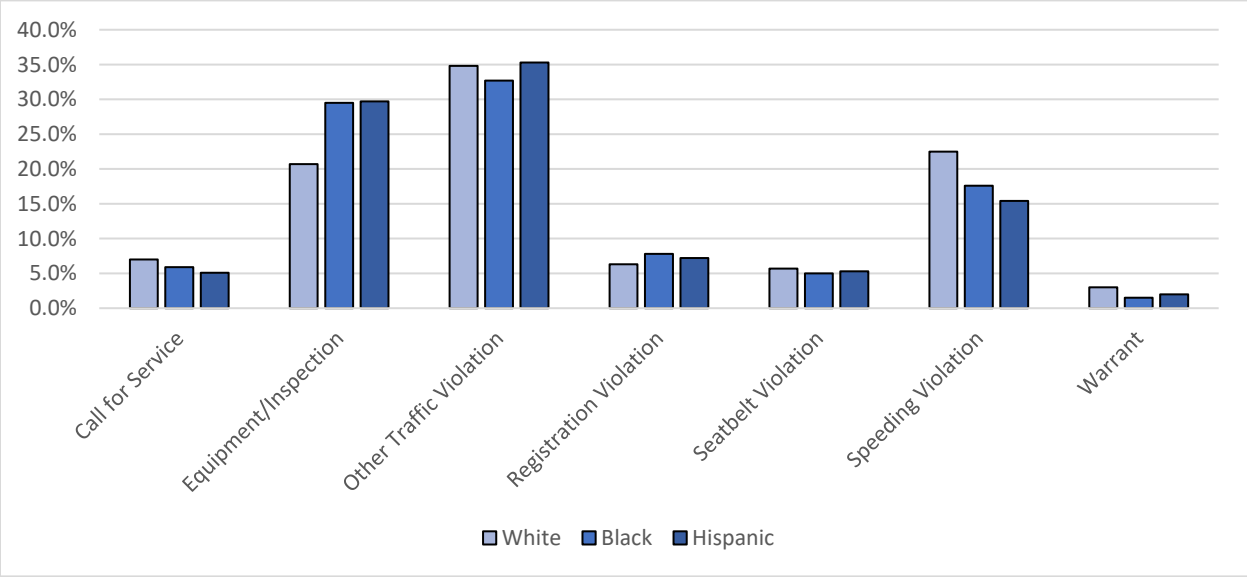
based outcomes is one of the tenets for participation in these federally funded programs. Stop demographics can also differ, particularly with respect to distracted driving campaigns which focus primarily, though not exclusively, on cell phone use. In general, cell phone stop demographics statistically tend to show higher proportions of female violators and lower proportions of minority drivers than is typical for other types of motor vehicle violations. Finally, the criteria for selection of locations to conduct selective enforcement could differ in some ways from the way stops are generally conducted. For example, effective distracted driving enforcement requires officers to be able to observe drivers in their vehicles without being observed themselves, which can make some locations for this type of enforcement more suitable than others even though the less suitable locations might have as many drivers potentially violating the targeted laws than the more suitable enforcement locations.

XII.F: Post-Stop Outcome Review

Basis for Stops

The reasons police use to stop a motor vehicle can vary significantly from department to department. We reviewed the basis for the stop that Warwick officers reported as the reason for stopping motor vehicles. The three most common reasons for stopping a motorist in Warwick made up 78% of all the stops. These reasons were stops made for "Other Traffic Violations"[21] (35%), equipment/inspection violations (22%), and speeding violations (21%). 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- and inspection-related violations than white drivers as a percentage of their total stops. Figure 12.8 illustrates by race and ethnicity the reason officers cited to stop a motor vehicle.

Figure 12. 8: Reasons for Traffic Stops



[21] If a stop was made for a reason other than one of the 11 categories listed as the basis for the stop, it is recorded as "other traffic violation." Some examples of stops that might be recorded as "other traffic violation" include traffic light violations, stop sign violations, and turning or lane violations.

Unfortunately, the way in which data is collected in Rhode Island does not allow a differentiation between equipment and inspection related stops, so these stops can't be separated from each other for analysis. There are a number of different violations that could be categorized as equipment violations, but the most common example is likely a stop made for defective lighting. On the other hand, an inspection violation would only occur if the vehicle was not in compliance with the Rhode Island safety inspection law. All vehicles registered in Rhode Island must have a valid Rhode Island inspection sticker. A vehicle safety and emissions test must be performed at least once every two years. That having been said, 22% (3,321 stops) of Warwick's stops were made for equipment- or inspection-related violations. This was above the state average of 20% during the study year. Of all the Hispanic drivers stopped in Warwick, 30% (413 stops) of them were stopped for equipment- or inspection-related violations. In addition, 30% (396 stops) of all the black drivers stopped in the city were pulled over for equipment- or inspection-related reasons. This compared to 21% (2,444 stops) of all white drivers. Conversely, 57% (6,758 stops) of all the white drivers stopped in the city were stopped for hazardous driving behaviors (such as speeding and other traffic violations) compared to 50% (675 stops) of black drivers and 51% (704 stops) of Hispanic drivers.

The data show that the frequency and location of where stops are made for equipment- or inspection-related reasons appear to have a lot to do with the overall racial and ethnic demographics of those stopped. 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 on race.

Over 55% (1,840 stops) of all equipment and inspection-related stops were made in six patrol areas (6, 9, 10, 11, 13, and 15). All six of these patrol areas are in one of the high enforcement areas of the city. Patrol posts 9, 10, 11, and 15 all cover the busiest sections of the Route 1 corridor. Patrol post 13 is the high enforcement area that includes the I-95 and I-295 interchange, the area near the Warwick mall and the high commercial activity area along Bald Hill Road. Finally, patrol post 6 includes the high enforcement corridor of Oakland Beach Avenue, which leads to one of the public beaches in the city. More specifically 12% (396 stops) were made in patrol post 10, 10% (339 stops) were made in post 13, 9% (299 stops) were made in post 9, 9% (290 stops) were made in post 11, 8% (261 stops) were made in post 6, and 8% (255 stops) were made in post 15. Although the majority of these stops were made in the high enforcement areas of the city, there were also extensive equipment and inspection-related stops made throughout the city. These stops represented a significant percentage of the traffic stops made in many patrol areas, except patrol post 12. The frequency and location of these stops in the high enforcement areas, particularly along the Route 1 corridor appears to have had an impact on the size of the disparity affecting both black and Hispanic drivers in Warwick. These patrol areas are the busiest corridors in the city and appear to have a higher percentage of non-resident minority drivers traversing them than other areas of the city.

Speed enforcement was also a significant basis for a traffic stop in Warwick. There were 3,160 stops made for speeding or 21% of all stops. This was a lower percentage of speed related stops when compared to the statewide average of 30% during the study year. Officers frequently rely on modern technology-based enforcement techniques, like using radar or a laser device, to make speeding stops. Depending on the types of locations and vehicle travel speeds involved, using technology-based enforcement techniques is

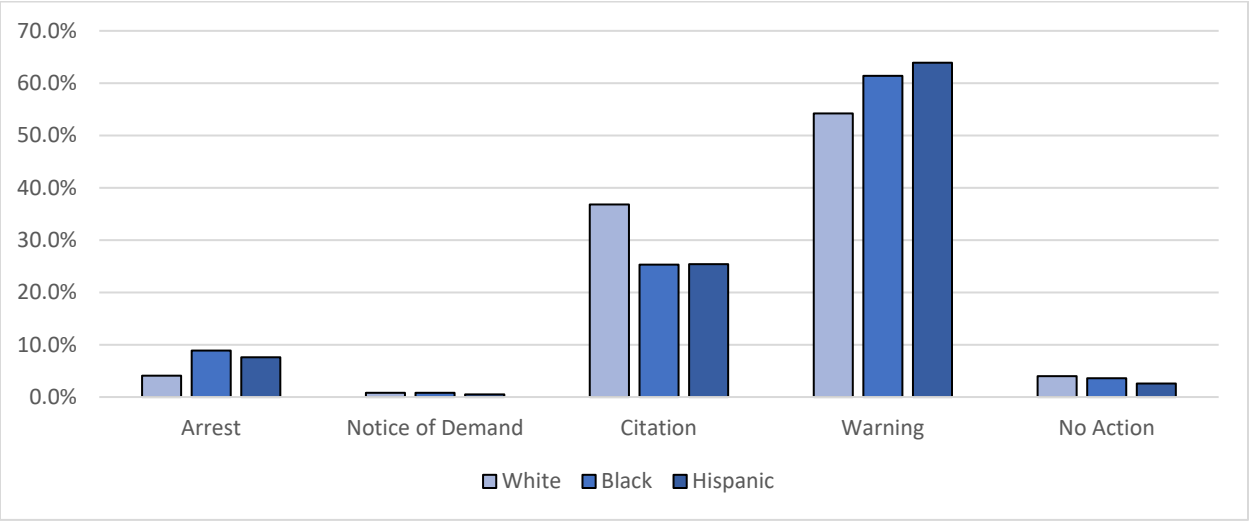
sometimes considered to be “blind”, that is, the officer may have a reduced opportunity to specifically identify driver characteristics before making a decision to act than with other types of violations where a more direct and frequently prolonged observation of the vehicle is made. At least theoretically, if all speeding stops could be considered blind with respect to predetermination of the drivers’ racial characteristics, they could possibly provide a useful if clearly imperfect window into the general racial make-up of drivers driving in an enforcement area.

The data available from Rhode Island does not capture information on technology-based speeding stops. That having been said, we believe it is reasonable to assume that a significant portion of Warwick’s speeding stops were probably technology based and provide the following analysis based on that assumption. The demographics for all speed-related stops in Warwick were 7% Hispanic drivers (214 stops), 7.5% black drivers (236 stops), 2% Asian and other drivers (52 stops), and 84% white drivers (2,658 stops). There was a higher percentage of white drivers stopped for speed-related violations compared to their overall proportion of all other stops made (84% compared to 78%). However, black and Hispanic drivers were stopped at a lower rate for speed-related violations than their overall proportion of all other stops (Black drivers – 7.5% compared to 9.5% and Hispanic drivers – 7% compared to 10%.) The largest number of speed-related stops occurred in six patrol areas, all in the high enforcement areas of town, particularly along the Route 1 corridor, the Bald Hill Road corridor and the Airport Road corridor (posts 9, 10, 11, 13, 14, and 15). These six patrol posts accounted for 54% of all speed-related stops. The demographics for these stops were 8.6% Hispanic drivers, 9.0% black drivers, 2.0% Asian drivers, and 80% white drivers. There was again a higher proportion of white drivers stopped for speed-related violations in these six high enforcement patrol posts than their proportion of all other stops in those areas (80% compared to 75%). A smaller proportion of black and Hispanic drivers were stopped for speed-related violations in these six patrol areas than their proportion of all other stops in that area (Black drivers – 9% compared to 11% and Hispanic drivers – 8.6% compared to 12%.) If, arguably, speeding stops might represent a better proxy of the actual driving population at any given time than all stops considered together, speeding stops may help to mitigate what could be a larger disparity in all stops not related to speed.

Outcome of Stops

The majority of motor vehicle stops in Warwick resulted in the driver receiving a warning (56%). When compared to white drivers, black and Hispanic drivers were more likely to receive a warning as a percentage of their total stops. White drivers were more likely to receive a citation. However, black and Hispanic drivers were more likely to be arrested resulting from a traffic stop. Figure 12.9 shows the outcome of motor vehicle stops by race and ethnicity.

Figure 12. 9: Outcome of Traffic Stop



The racial and ethnic disparities identified in the warning versus citation rates is unsurprising given the correlation with the disparity also identified in the basis for the stop. The violations that affected minority drivers at a disproportionate rate were more likely to result in a warning (i.e., equipment or inspection violations and registration violations) and the violations that disproportionately affected white drivers were more likely to result in a citation. For example, minority drivers were more likely to be stopped for an equipment- or inspection-related violation and 81% of these stops resulted in a warning. Conversely, white drivers were more likely to be stopped for speed-related violations and 46% of these stops resulted in a warning.

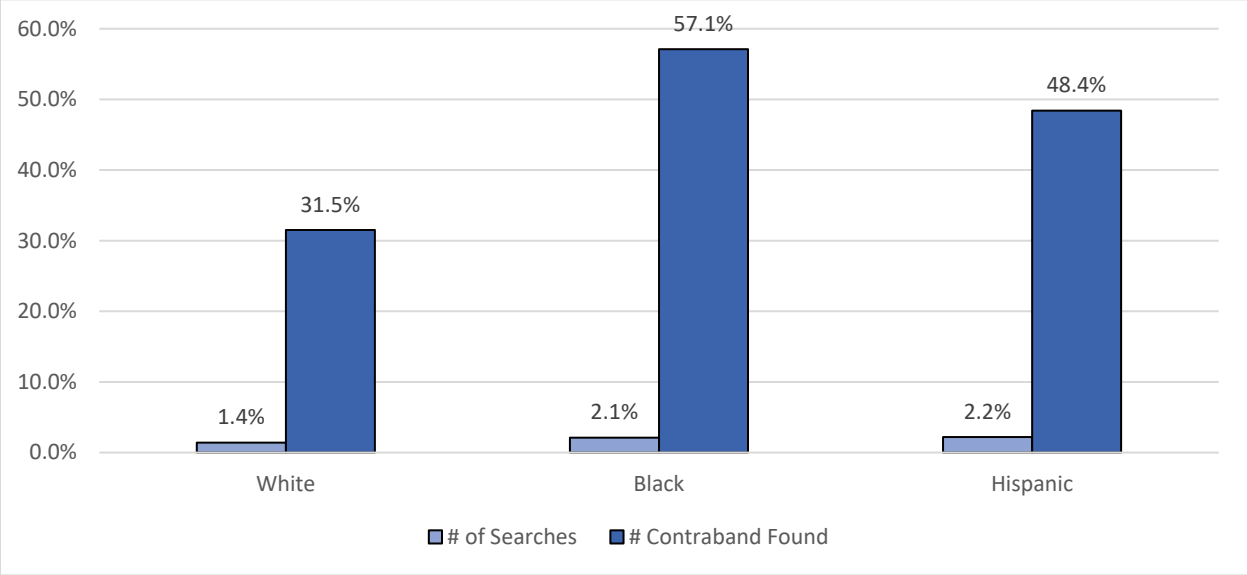
In Warwick, 708 of the stops resulted in the arrest of either the driver or a passenger (4.8%). This was greater than the statewide average of 3% for stops resulting in an arrest. Of the 708 arrests, the driver of the vehicle was arrested in 681 cases and the passenger was arrested in 27 cases. The racial demographics of individuals arrested as a result of a traffic stop were 66% white, 17% black, and 15% Hispanic. When considered as a proportion of their total stops, black and Hispanic drivers were more than twice as likely to be arrested compared to white drivers (9% of all black drivers stopped and 8% of all Hispanic drivers stopped compared to 4% of all white drivers stopped). Unfortunately, we are unable to determine the reason for the arrest but can identify why the vehicle was initially stopped. Of the 708 reported arrests, the basis for stopping a vehicle was an "other traffic violation" (221 stops), call for service (133 stops), equipment/inspection violation (132 stops), registration violation (97 stops), and speeding (60 stops), with the remaining arrests for some other reason (65 stops). Although the dataset doesn't allow researchers to determine the reason for the arrest, the assumption is that a more significant violation was identified.

Search Information

A review of department search information shows that less than 2% (224) of the drivers stopped in Warwick were subjected to a motor vehicle search. This rate of motor vehicle searches is lower than the state's 3.8% average. Stops of black and Hispanic drivers resulted in a higher search rate than white drivers. Contraband was also found at a higher rate for black and Hispanic drivers than white drivers. When researchers applied the hit-rate test, referred to as the KPT hit-rate test, there were no racial

disparities identified in the Warwick search data. The search analysis is limited to discretionary searches which are defined as those characterized as consent or probable cause since inventory searches are likely correlated with other offenses as well as race. Figure 12.10 illustrates the percentage of all searches and the rate at which contraband was found (the "hit rate").

Figure 12. 10: Search and Hit Rate



XII.G: 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, areas with high accident rates and 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 some of these factors. Basic information on crime, accidents, and other economic factors associated with Warwick provide a context to potentially explain the rational for police deployments that are important considerations.

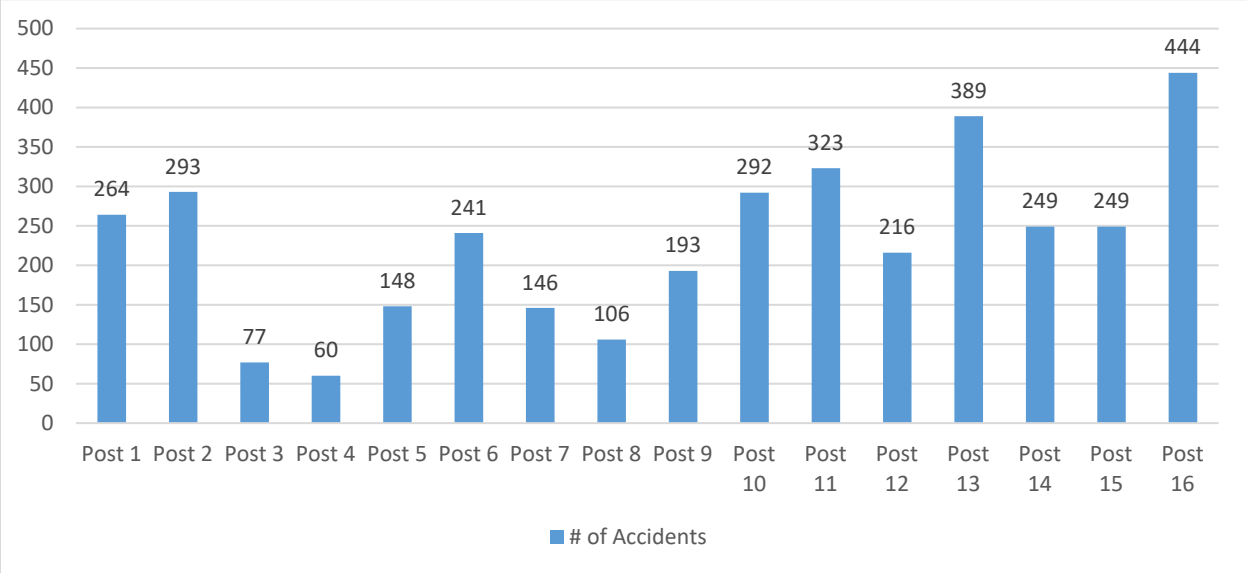
Crime data and pattern activity is an integral component of a department's crime control and reduction strategy. Taking into consideration the location of Warwick's overall index crimes in more detail helps to provide a better understanding of what may be leading Warwick officers to be more active in some areas of the town than in others. Warwick reported 2,802 index crimes in 2018, which are eight crimes the FBI combines to produce its annual crime index. The offenses include homicide, forcible rape, robbery, burglary, aggravated assault, larceny over $50, motor vehicle theft, and arson. Of the 2,802 offenses, 42% (1,186 offenses) were for larceny, 13% (363 offenses) were for assault, 11% (306 offenses) were for destruction of property, 11% (301 offenses) were for drug violations, and the remaining 23% (646 offenses) were for some other offense. The most offenses occurred in patrol post 14 with 619 offenses. This is unsurprising given that the Warwick Mall is located within this patrol post and more than half the offenses committed in the area was for shoplifting. The high enforcement areas of the city that have been identified throughout this report appear to closely correspond with the areas with the higher levels of reported crime. Crime appears to be occurring at a greater rate in the patrol posts surrounding the airport

and along the Route 1 corridor. Crime also appears to be higher in the area along Bald Hill Road and the Warwick Mall.

According to the Warwick Police Department 2018 annual report, officers across three patrol shifts responded to 89,258 calls for service, which included calls for service and officer-initiated actions that were called in to police dispatch. The first shift operates between 7:00 a.m. and 4:00 p.m. and responded to 32,857 calls for service. The first shift also handled 626 arrests, 2,144 accidents, and 3,039 offense reports. The second shift operates between 3:00 p.m. to midnight and responded to 33,242 calls for service. This shift also handled 1,360 arrests, 1,697 accidents, and 3,385 offense reports. Lastly, the third shift operates during the overnight hours between 11:00 p.m. and 8:00 a.m. and responded to 23,159 calls for service. They also handled 451 arrests, 451 accidents and charges 117 drivers with driving under the influence during 2018.

During our study period, there were approximately 3,701 motor vehicle accidents on roads patrolled by the Warwick Police Department. Although we don't have the specific road locations for each reported accident, we do have the number of accidents in each patrol area. Many of the same high enforcement patrol areas also appear to have the higher number of accidents, with a few exceptions. The highest number of accidents occurred in post 16 (444 accidents), post 13 (389 accidents), post 11 (323 accidents), post 2 (293 accidents), and post 10 (292 accidents). Posts 10, 11, and 13 are all high enforcement patrol areas. Traffic enforcement is lower in posts 2 and 16, however the accident rate is much greater. It is likely that the high number of traffic accidents in post 16 is related to traffic activity along Bald Hill Road. Bald Hill Road is the major corridor that runs through posts 13 and 16 and likely accounts for a large share of the accidents in those patrol areas. Patrol post 2 covers a large section of shoreline in Warwick and may be impacted by seasonal traffic to the local beaches. Figure 12.11 illustrates the total number of accidents by patrol posts.

Figure 12. 11: Accidents by Patrol Post



XII.H: Summary of Findings

The Warwick Police Department identified factors they believe contributed to the minority disparity identified in the initial analysis of traffic stops. In particular, the department identified areas with the highest call for service volume, the highest crime rates and the highest levels of traffic as some of the same areas with the highest levels of motor vehicle enforcement. Several major roadways and highway corridors run through Warwick and impact traffic enforcement. Those roadways include Interstate 95 (I-95), Interstate 295 (I-295), Route 1, T.F. Green Airport Connector Road, Route 37 (Lincoln Avenue Freeway), and Route 2. Many of these corridors act as major arteries within Warwick connecting Providence and Cranston. Our analysis of traffic stops by patrol area confirms that departmental resources are more heavily concentrated in five patrol areas. In particular, traffic enforcement appears to be more highly concentrated in the patrol areas closest to the airport and along Route 1. The patrol posts with the highest levels of enforcement include posts 9, 10, 11, 13, and 15. All five of these patrol posts account for 47% of all traffic enforcement in the city. The largest number of minority drivers were stopped these five patrol areas, which account for 56% of all minority drivers stopped during the study year.

In addition to an analysis of traffic stops by patrol post, researchers also conducted a "plat" or neighborhood level analysis. Traffic stops are recorded by a number associated with the city assessor's plat map. For our purposes it is essentially a neighborhood map and was a good way to drill down on specific stop locations within the city. Based on the neighborhood level review there were two areas identified with high levels of traffic enforcement and two areas identified with moderate levels of traffic enforcement. The high traffic enforcement areas included (1) the Post Road and Jefferson Boulevard corridors from Veterans Memorial Drive north to the Cranston border, and (2) the area between Toll Gate Road and East Avenue as well as the area between I-295 and Bald Hill Road. The two moderate traffic enforcement areas included (1) Airport Road between the Post Road and Warwick Avenue on the north side of the airport, and (2) the neighborhoods near the shoreline by Oakland Beach Avenue.

The Post Road and Jefferson Boulevard corridors are the busiest patrol areas in Warwick and accounts for the largest percentage of traffic stops (20%). There is high traffic volume along both roadways with approximately 38,000 cars a day traveling along the Post Road between Main Avenue and Airport Road and approximately 30,000 cars a day traveling along Jefferson Boulevard between the T.F. Green Connector and Route 37. The racial breakdown of drivers stopped in this area were 76% white drivers, 10% black drivers, 11% Hispanic drivers, and 3% other drivers. There were a higher percentage of both black and Hispanic drivers stopped along these corridors than the city.

The area between Toll Gate Road and East Avenue is the second busiest patrol area in the city with 11% of all traffic stops. This high traffic enforcement area includes the complex interchange between I-95, I-295, and East Avenue. Additionally, the section of Bald Hill Road is a high commercial activity corridor that leads to the Warwick Mall. The Community College of Rhode Island- Knights Campus, Toll Gate High School, and Kent Hospital are all located in this high activity area. The racial breakdown of drivers stopped in this area were 82% white drivers, 9% black drivers, 7% Hispanic drivers, and 2% other drivers. The demographics of drivers stopped in this area mirrored the city average for black drivers but was lower for Hispanic drivers.

The more moderate traffic enforcement areas in the city was the Airport Road corridor and the corridors located in and around Oakland Beach Avenue. The Airport Road corridor accounted for 9.5% of all traffic stops and the shoreline corridors accounted for 7% of all traffic stops in Warwick. Airport Road is a high

traffic volume roadway with approximately 28,000 cars a day traveling along the corridor. The racial breakdown of drivers stopped on or near Airport Road mirrored the city average for Hispanic drivers but was lower for black drivers. Traffic volume was also higher along West Shore Road with approximately 27,000 cars a day and Oakland Beach Avenue with approximately 20,000 cars a day. There were fewer minority drivers stopped in this area of the city than the other high enforcement areas.

Warwick's traffic stop data also reflects (1) a very low non-white driving age resident population and (2) a fairly large proportion of non-residents who make up the majority of people who were stopped in town. Since 60% of all drivers stopped in Warwick were non-residents, the overall impact out-of-town drivers had on the stop data is fairly clear. Non-resident black and Hispanic drivers were more likely to be stopped than non-resident white drivers. Approximately 80% of black drivers stopped and 84% of Hispanic drivers stopped were not residents, compared to 56% of white drivers who were non-residents. The influence non-resident drivers had on stop demographics affected patrol areas to varying degrees. Seven of the 16 patrol posts (posts 1, 9, 12, 13, 14, 15, and 16) are largely influenced by out-of-town traffic. All seven of these patrol posts are located on the western side of Route 1, and include Route 1, most of the T.F. Green Connector, the I-95 and I-295 interchange, Route 37, and Jefferson Boulevard. These are all high enforcement and high traffic volume roadways in town, and many serve as major thoroughfares to the state's largest airport. On average, 74% of all drivers stopped in these patrol areas were not residents of Warwick. More specifically, non-resident minority drivers were stopped in these areas at a higher rate than non-resident white drivers (88% of minority drivers stopped were non-residents compared to 69% of white drivers.)

Traffic Stop Outcomes

In Warwick, the three most common reasons used for stopping a motorist make up 78% of the total stops. The three largest stop categories were for Other Traffic Violations[22] (35%), equipment or inspection violations (22%), and speeding violations (21%). 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- and inspection-related violations than white drivers as a percentage of their total stops.

Racial and ethnic disparities were most pronounced in equipment/inspection violations and speeding violations. Over 30% of black drivers and 30% of Hispanic drivers were stopped for equipment/ inspection violations compared to 21% of white drivers. Conversely, 57% of all the white drivers stopped in town were stopped for hazardous driving behaviors (such as speeding and other traffic violations) compared to 50% of black drivers and 51% of Hispanic drivers. The data shows that, with respect to the racial and ethnic demographics of those stopped for equipment- or inspection-related violations are closely related to the frequency and location of where the stops are made. A majority of these stops were made in six patrol areas (6, 9, 10, 11, 13, and 15). All six of these patrol areas are in one of the high enforcement areas of the city. The frequency and location of these stops in the high enforcement areas, particularly along the Route 1 corridor appears to have been an important factor in the Warwick disparity involving both black

[22] If a stop was made for a reason other than one of the 11 categories listed as the basis for the stop, it is recorded as "other traffic violation." Some examples of stops that might be recorded as "other traffic violation" include a traffic light violation or stop sign violation.

and Hispanic drivers. These patrol areas are the busiest corridors in the city and appear to have a higher percentage of non-resident minority drivers traversing them than other areas of the city.

Speed enforcement was also a significant basis for traffic stops and accounted for 21% of all stops. Officers frequently rely on modern technology-based enforcement techniques, like using radar or a laser device, to make speeding stops. Using technology-based enforcement techniques is sometimes considered to be "blind", that is, the officer may have a reduced opportunity to specifically identify driver characteristics before deciding to stop a vehicle. The largest percentage of speed-related stops (54%) occurred in six patrol areas, all in the high enforcement areas of town, particularly along the Route 1 corridor, the Bald Hill Road corridor and the Airport Road corridor. The demographics for these stops were 8.6% Hispanic drivers, 9.0% black drivers, 2.0% Asian drivers, and 80% white drivers. A higher proportion of white drivers and a smaller proportion of black and Hispanic drivers were stopped for speed-related violations in these high enforcement patrol areas than their proportion of all other stops in that area. At least theoretically, if all speeding stops could be considered blind with respect to predetermination of the drivers' racial characteristics, they could possibly provide a useful if clearly imperfect window into the general racial make-up of drivers driving in an enforcement area. The racial demographics of all speed-related stops in Warwick more closely mirrored the racial demographics for all stops in town. Of the drivers stopped for speeding, 84% were white, 7.5% were black and 7% were Hispanic. A smaller percentage of black and Hispanic drivers were stopped for speeding than their overall representation in all stops, but the differences were small. This could be an indication that police are stopping a more representative sample of the actual driving population in the city.

Regarding stop outcomes, the majority of vehicle stops in Warwick resulted in the driver receiving a warning. Black and Hispanic drivers were more likely to receive a warning as a result of a stop and white drivers were more likely to receive a citation. The racial and ethnic disparities identified in the warning versus citation rates is unsurprising given the correlation with the disparity also identified in the basis for the stop. The violations that affected minority drivers at a disproportionate rate were more likely to result in a warning (i.e., equipment or inspection violations and registration violations) and the violations that disproportionately affected white drivers were more likely to result in a citation. When considered as a proportion of their total stops, black and Hispanic drivers were more than twice as likely to be arrested as a result of a stop compared to white drivers. Unfortunately, it is not possible to determine the reason for an arrest, but presumably the officer made some additional determination beyond the reason for the stop that an offense occurred warranting an arrest.

Warwick police searched fewer than 2% of the drivers they stopped, which was below the state average of 3.8%. Stops of black and Hispanic drivers resulted in a higher search rate than white drivers. However, contraband was also found at a higher rate for black and Hispanic drivers than white drivers. Given the relatively small number of searches conducted, no meaningful conclusions can be drawn.

Conclusion

Taken as a whole, the Warwick traffic stop data reflects the influence of Route 1, the area near Airport Road, and the area near Bald Hill and Toll Gate Road. These areas appear to be somewhat more diverse than the predominantly white resident driving age population. The patrol areas around these roads appear to have a relatively high level of enforcement and a relatively higher proportion of non-resident minority drivers traveling them. These corridors are major traffic generators for the city with areas that

have large commercial activity and a major state airport. The high enforcement patrol areas also mirror where the highest call for service volume, the highest crime rates and the highest levels of traffic occur.

After a full review, the disparities do not appear excessive in nature. However, in the future if the department should see racial and ethnic disparities increase from the level established in this report, it is recommended that the department:

(1) review its traffic enforcement policies in along Route 1, Airport Road, and in the Bald Hill Road and Toll Gate Road area in order to evaluate the extent to which they may have a disproportionate effect on black and Hispanic drivers and
(2) evaluate both the location and frequency of stops that involve equipment- or inspection-related motor vehicle violations, to better understand the impact they may be having on minority drivers.

XIII: WESTERLY 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 researchers conduct an in-depth analysis for the Westerly Police Department.

According to the results from the "Solar Visibility" analysis, the Westerly Police Department indicated a statistically significant disparity in the rate that Hispanic motorists were stopped during daylight relative to darkness. Within the inter-twilight window, the odds that a stopped motorist was Hispanic increased by 2.1 during daylight relative to darkness. The results for Hispanic motorists were statistically significant at a level greater than 99 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 2018 calendar year, the Westerly Police Department made 4,871 traffic stops. Of these, 11% were minority stops (3% Hispanic and 5% black). Table 13.1 below compares summary racial data for reported traffic stops in Westerly over a three-year period.

Table 13. 1: Westerly Traffic Stops – 2016 - 2018

	2016 Stops		2017 Stops		2018 Stops	
White	4,364	89.8%	5,518	90.3%	4,339	89.1%
Black	227	4.7%	258	4.2%	243	5.0%
Asian	64	1.3%	107	1.8%	82	1.7%
NA*	37	0.8%	40	0.7%	42	0.9%
Hispanic	167	3.4%	186	3.0%	165	3.4%
Total	**4,859**		**6,109**		**4,871**	

*Native American

XIII.A: Descriptive Analysis of the 2018 Traffic Stop Data

Researchers studied the racial and ethnic disparities in the Westerly Police Department data using a more detailed review of traffic enforcement during the study period. Part of the analysis involved reviewing the detailed location descriptions provided by the department and any enhancement we were able to make. Westerly officers record the location of a traffic stop by patrol posts. The town is divided into five patrol posts. Although we are unable to determine the specific street location of each stop, the patrol posts provide us with enough information to assess the differences in areas within the town.

According to the 2010 census, Westerly is a town with approximately 18,560 residents over the age of 16. Approximately 7% of the driving age population in Westerly is identified as a minority. Table 13.2 outlines the basic demographic information for Westerly residents over age 16.

Table 13. 2: Westerly Population

Race/Ethnicity	16+ Population Total	% Population Total
White Non-Hispanic	17,256	93.0%
Black Non-Hispanic	148	0.8%
AsPac Non-Hispanic	450	2.4%
Hispanic	412	2.2%
Other	294	1.6%
Total	**18,560**	

Westerly is approximately 75 square miles, of which 30 square miles is land and 45 square miles is water. It is a beachfront community located on the south shore of the state. The town is one of eight towns located in Washington County with Hopkinton to its north, Charlestown to its east and Stonington, Connecticut to its west. The three border towns are predominately white demographically, with an average white driving age population of 96% (compared to Westerly's white driving age population of 93%).

The Pawcatuck River separates Westerly from Connecticut on the western border of town. The river flows into Little Narragansett Bay. Three large salt ponds lie along the coast of Westerly. From west to east, those ponds include Maschaug Pond, Winnapaug Pond, and Quonochontaug Pond. Westerly is also a popular tourist destination during the summer months, where it is predicted that the population nearly doubles. There are five well-known beaches in town including, Weekapaug Beach, Westerly Town Beach, Misquamicut State Beach, East Beach and Watch Hill Beach.

Route 1 is a 6.5 mile main thoroughfare through the town. The roadway is locally known by four names including Broad Street, Granite Street, Franklin Street, and Post Road. Broad Street is the western portion of Route 1 which borders Connecticut and runs east to the intersection with Elm Street where it becomes Granite Street. Granite Street continues east until it intersects with East Avenue. At this point Route 1 becomes Franklin Street until just south of Route 78 where it becomes the Post Road through the remainder of town. Route 1 enters Rhode Island through Westerly and winds through the downtown area. The downtown area includes two shopping plazas and a number of other shopping and entertainment establishments. Route 1 is a major thoroughfare to access Westerly State Airport, and Watch Hill and Misquamicut beaches.

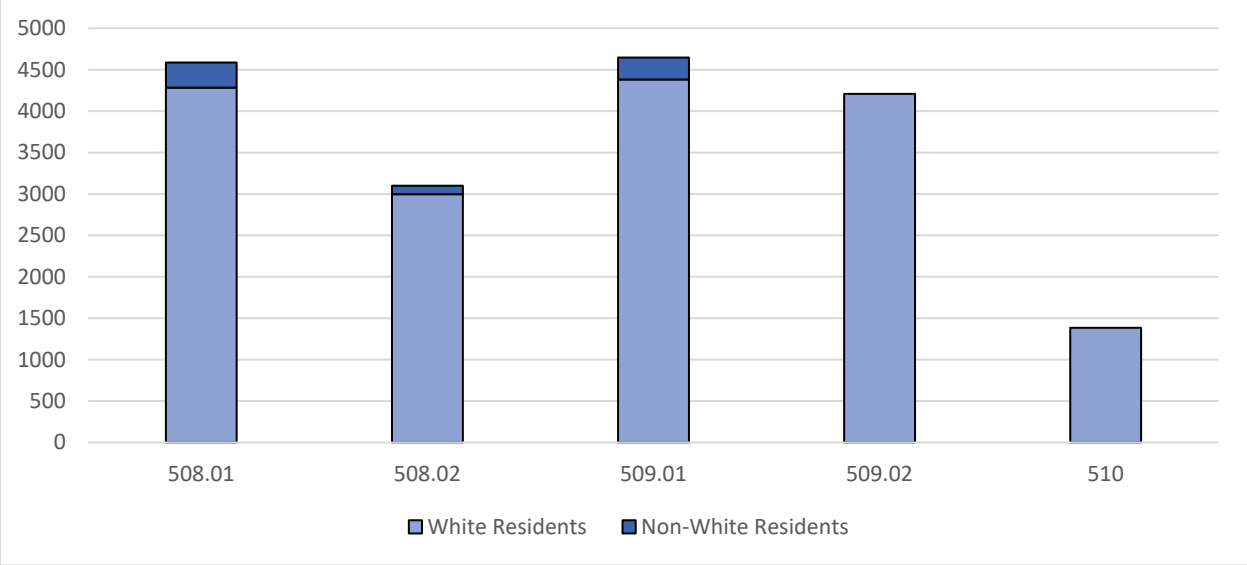
Other major thoroughfares in town include routes 1A, 2, 91 and 78. Route 78 is also knowns as the Westerly Bypass because it forms a bypass around the downtown area and connects Stonington, Connecticut to Westerly. Route 1A is a more scenic roadways which runs parallel to Route 1. Route 1A runs for about 8 miles through the entire southern length of Westerly and serves as a local roadway for the entire coastal community. Route 3 is a state highway which serves as a local alternative to Interstate 95. Finally, Route 91 begins at the intersection with Route 3 and heads east as a two-lane commercial street through much of town before it crosses into Hopkinton.

Of the drivers stopped in Westerly, 45% were town residents while 55% lived somewhere other than Westerly. Westerly's proportion of non-resident drivers stopped was the fourth lowest of any town in Rhode Island. Thus, while all Rhode Island towns are affected by non-resident drivers to one extent or

another, non-residents had less influence on the Westerly data than in most other Rhode Island communities.

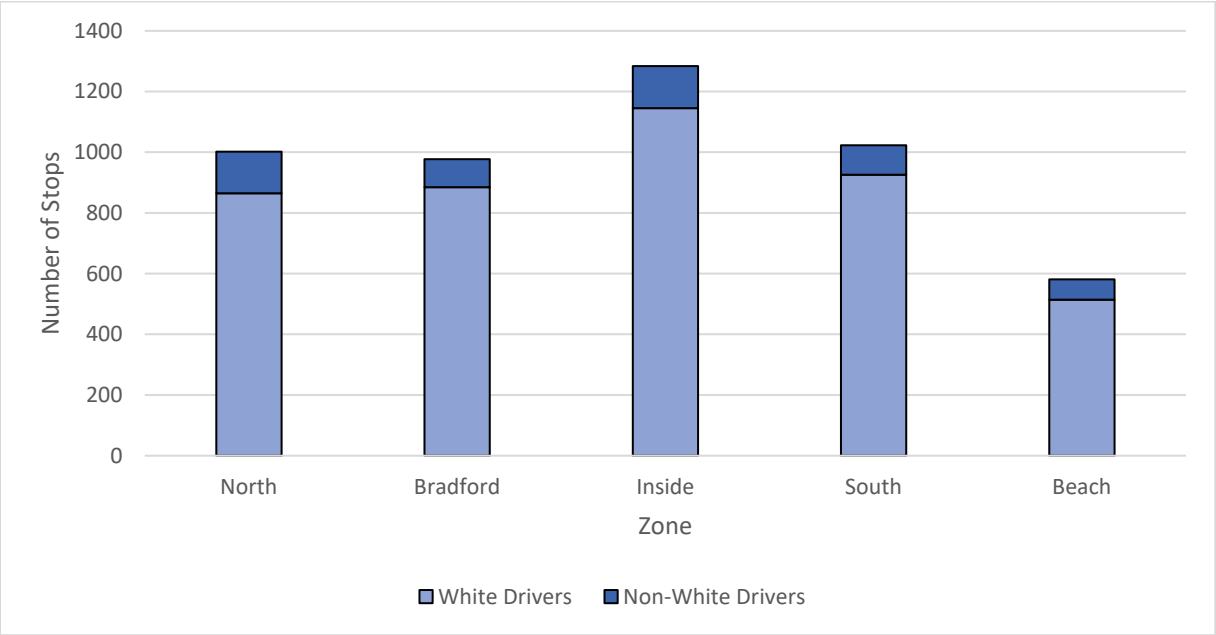
Although we do not conduct an analysis by census tract, it is still helpful to understand the racial make-up of different sections of the town, as evidenced in the census tract data. The U.S. Census Bureau divides Westerly into five census tracts. The resident driving age population in each census tract varies from about 1,400 to about 4,600 people, with the largest concentration (26% of the total population) in tract 509.01. Census tract 509.01 covers the north western and central portion of the town. This census tract covers portions of Routes 1, 3, 78 and 91. Figure 13.1 shows the distribution for each census tract in terms of white and non-white driving age populations.

Figure 13. 1: Age 16 and Older Resident Population by Census Tract



The records management system used by the Westerly Police Department captures the location of traffic stops in one of five patrol zones that divide the town. Figure 13.2 illustrates the volume of traffic enforcement that occurs in each of the five patrol zones. Traffic enforcement appears to be most highly concentrated in the smallest geographic patrol zone, which is known as “Inside”. This patrol area primarily covers the downtown historic district between the Pawcatuck River and Route 1 from west to east and Pleasant Street to Well Street from north to south. The Inside patrol area accounts for 26% of all stops in the town. In this patrol area the stop demographics included 11% minority drivers and 89% white drivers. The largest number of minority drivers were stopped in this patrol area.

Figure 13. 2: Traffic Stops by Patrol Beat

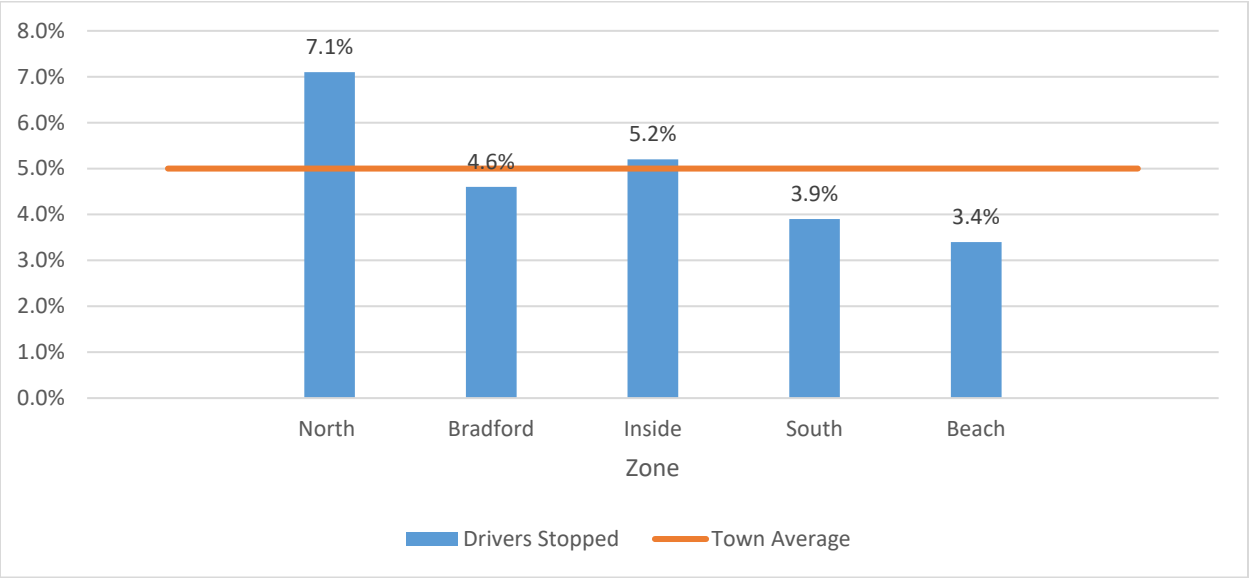


XIII.B: Traffic Stop Breakdown by Race/Ethnicity

In Westerly, 11% of all drivers stopped were minority drivers, classified as all non-white drivers, but predominantly black or Hispanic drivers. Westerly's resident population age 16 and older is 7% minority. Although the difference between the two suggests a disparity in the proportion of minority drivers stopped during the study period, variations in the racial and ethnic makeup of different areas of Westerly and the influence of out-of-town drivers in the areas of the highest enforcement has an effect on those stop demographics.

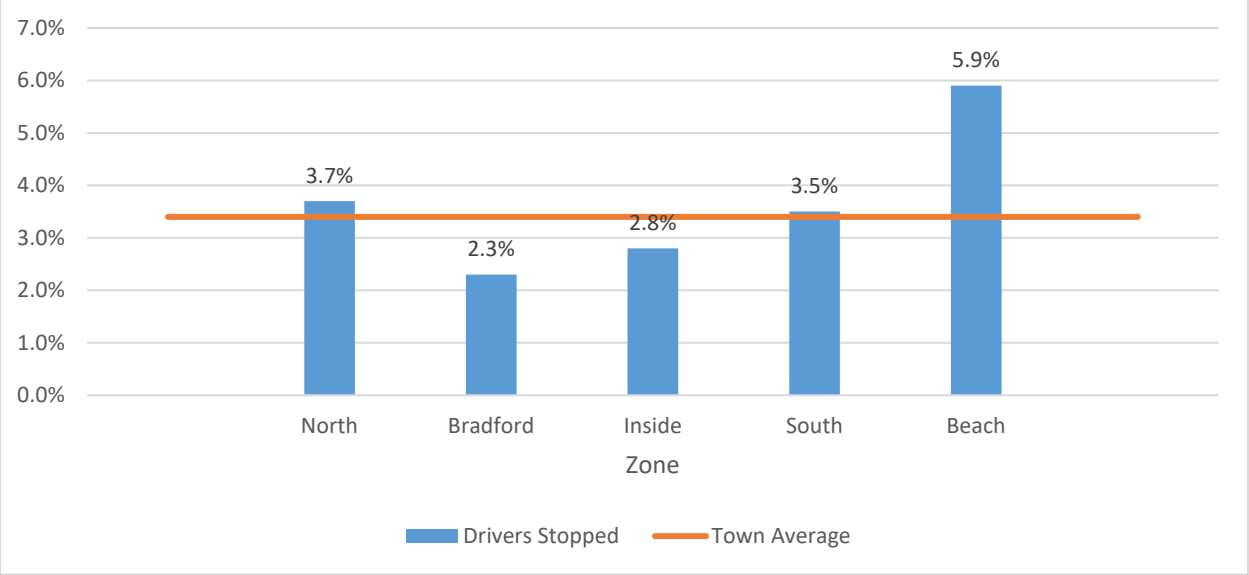
The overall percentage of Westerly traffic stops involving black drivers was 5%. The town average of 5% of black drivers stopped was exceeded in two of the five patrol zones, but most significantly in the North patrol area. Of the two zones that exceed the town average, the Inside patrol area only exceeded the town average by 0.2%. The North patrol area has the largest disparity for black drivers stopped and exceeded the town average by 2.1%. These two patrol zones account for 57% of where all black drivers were stopped. It is worth noting that 60% of all black drivers stopped in Westerly were not residents of the town. Figure 13.3 shows the difference between the black drivers stopped by patrol zone and the town average.

Figure 13. 3: Black Drivers Stopped Compared to Town Average



The overall percentage of traffic stops involving Hispanic drivers was 3.4%. The percentage of Hispanic drivers stopped exceeded the town average of 3.4% in three of five patrol zones in town. Of the three zones that exceed the town average, the North and South patrol zones only exceeded the town average by less than 0.3%. However, the Beach patrol area exceeded the town average by 2.5%. The Beach area is located along the entire southern coastline of Westerly and includes most of the public and private beaches in town. These three patrol areas account for 53% of where all Hispanic drivers were stopped. It is worth noting that 62% of all Hispanic drivers stopped in Westerly were not residents of the town. Figure 13.4 shows the difference between the Hispanic drivers stopped by patrol area and the town average.

Figure 13. 4: Hispanic Drivers Stopped Compared to Town Average



XIII.C: Non-Resident Component of Westerly Traffic Stops

To a great degree, Westerly's traffic stop data tended to reflect two basic influences: (1) an extremely low non-white driving age resident population and (2) a relatively large proportion of non- residents who make up the majority of people who were stopped in town. Westerly's resident driving age population is estimated as 93% white, 0.8% black, 2% Hispanic, and 2.4% Asian/Pacific Islander. The demographics of the Westerly residents who were stopped during the study year showed only a small disparity for Hispanic drivers, but a larger disparity for black drivers. Hispanic resident drivers stopped represented 2.9% of the drivers stopped compared to the town resident population, which is 2.2%. On the other hand, 4.4% of resident drivers stopped were black compared to the town resident population, which is 0.8%. The disparity was most significant for non-resident stops. Since 55% of all drivers stopped in Westerly were not residents, out-of-town drivers clearly had an impact on the stop data.

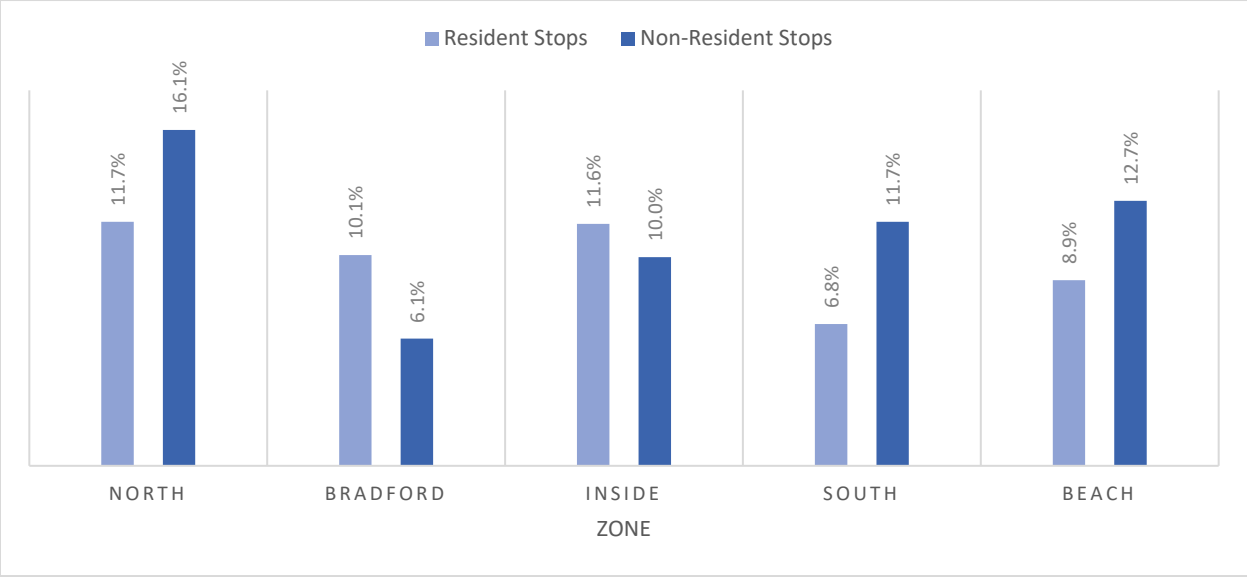
The racial breakdown of drivers stopped who were not residents were as follows: 88.4% white, 3.8% Hispanic, 5.5% black, and 1.4% Asian/Pacific Islander. In comparison to stop demographics (including both residents and non-residents), the overall effect of non-resident minority drivers stopped is fairly clear, though it is more significant in some patrol zones more than others. Non-resident drivers were less white (88% compared to 89%,), slightly more black (5.5% compared to 5.0%), and slightly more Hispanic (3.8% compared to 3.4%). The combined percentages for all non-resident minority drivers was 11.6% compared to 10.9% for all stops. Approximately 60% of black drivers and 62% of Hispanic drivers stopped were not residents, compared to 54% of white drivers.

As previously noted in this report, the resident driver component of the Westerly traffic stop data was one of the highest for any Rhode Island municipality and well below the state average. The average non-resident component for all 37 Rhode Island municipalities was 73.5%. Westerly's non-resident component was 55%. Thus, while Westerly's data exhibits a significant non-resident driver influence it seems to be less than many other Rhode Island towns.

Our examination of all five Westerly patrol districts identifies several districts where the non-resident effect may be the most pronounced. Non-resident drivers stopped had a greater impact in the Beach and Bradford patrol areas. Almost 70% of all drivers stopped in these areas were not residents of Westerly. On the other hand, less than 50% of all drivers stopped were not residents in the Inside and North patrol areas. Approximately 54% of drivers stopped in the South patrol area were residents of Westerly. The greater impact of out-of-town drivers stopped in the Bradford and Beach patrol areas is unsurprising given that traffic volume increases considerably during the summer months because of local beaches and other summer attractions.

Figure 13.5 shows the percentage of minority resident drivers stopped by patrol area compared to minority non-resident drivers stopped. The values shown in Figure 13.5 for each zone show the proportion of residents stopped in the zone who were minority drivers and the proportion of non-residents stopped who were minority drivers.

Figure 13. 5: Percent of Minority Resident Drivers compared to Minority Non-Resident Drivers



XIII.D: Special Enforcement Campaigns

Westerly participated in special enforcement campaigns that were sponsored by the Rhode Island Department of Transportation through funds made available by the National Highway Traffic Safety Administration (NHTSA). Westerly reported a total of 643 stops as part of the NHTSA-funded campaigns. The Special Enforcement campaigns in which Westerly participated focused on (1) seatbelt safety ("Click-It or Ticket"), (2) driving while intoxicated (DWI), (3) Speed enforcement, (4) distracted driving, and (5) Pedestrian Safety. The Westerly Police Department was able to identify only the dates, number of stops and outcome of the stop for special enforcement campaigns. The case numbers for each stop were not available to match to the traffic stop database.

Of the 643 stops made as part of the special enforcement campaigns, 212 (33%) were reported as part of the driving while intoxicated campaigns, 242 (38%) were part of "Click-It or Ticket" campaigns, 116 (18%) were part of the speeding enforcement campaign, 36 (6%) were part of a distracted driving campaign, and 37 (6%) were part of the pedestrian safety campaigns. Total stops made during special enforcement campaigns accounted for only 13% of all stops made in Westerly during the study period. Westerly appeared to participate in NHTSA funded campaigns during September and December. Westerly conducted stops as part of a NHTSA funded campaign during 15 days in September, 10 days in December, 8 days in May, 7 days in April, 6 days in March, July, and November and less than 5 days during each of the remaining months. The most campaign funded stops occurred in September with 168 stops, followed by December with 88 stops.

When a town has participated in these enforcement campaigns and made a significant portion of its total traffic stops as part of them, it can add an additional dimension to analysis of the town's stop data because they can affect the overall data for the town in several ways. For example, stop outcomes for stops made during selective enforcement campaigns can, and usually do, result in a high proportion of penalty outcomes rather than warnings compared to stops made during regular routine patrol activities where officers may have more discretion in deciding whether or not to ticket the violator. Imposition of penalty-

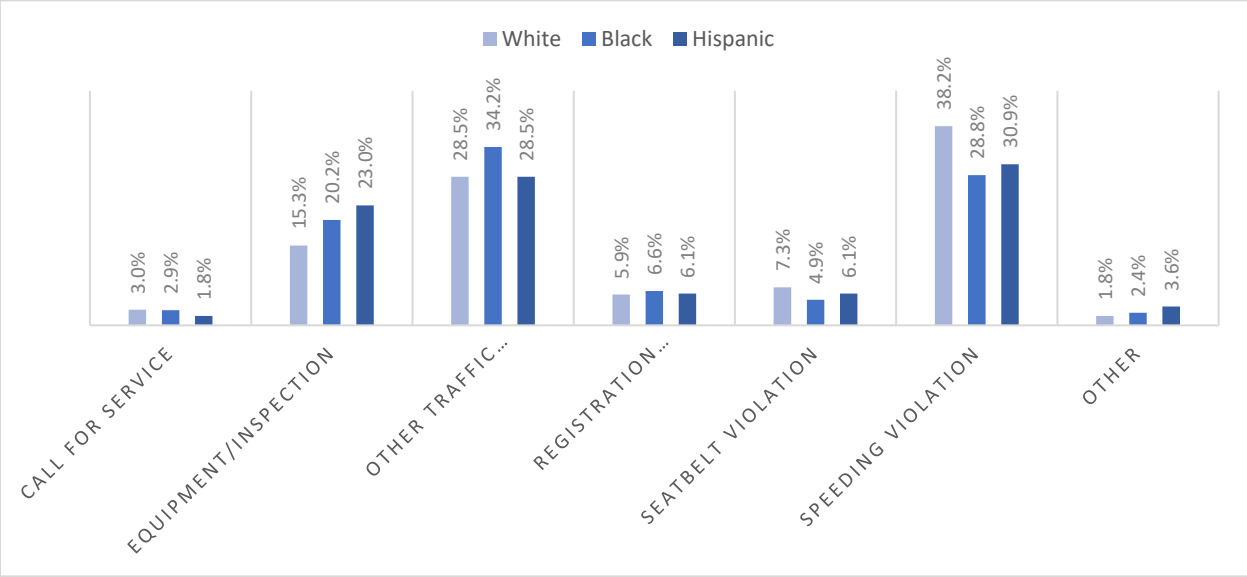
based outcomes is one of the tenets for participation in these federally funded programs. Stop demographics can also differ, particularly with respect to distracted driving campaigns which focus primarily, though not exclusively, on cell phone use. In general, cell phone stop demographics statistically tend to show higher proportions of female violators and lower proportions of minority drivers than is typical for other types of motor vehicle violations. Finally, the criteria for selection of locations to conduct selective enforcement could differ in some ways from the way stops are generally conducted. For example, effective distracted driving enforcement requires officers to be able to observe drivers in their vehicles without being observed themselves, which can make some locations for this type of enforcement more suitable than others even though the less suitable locations might have as many drivers potentially violating the targeted laws than the more suitable enforcement locations.

XIII.E: Post-Stop Outcome Review

Basis for Stops

The reasons police use to stop a motor vehicle can vary significantly from department to department. We reviewed the basis for each stop that Westerly officers reported as the reason for stopping motor vehicles. The three most common reasons for stopping a motorist in Westerly made up 82% of the total stops. The three largest stop categories were for speeding violations (37%), Other Traffic Violations[23] (29%), and equipment or inspection violations (16%). 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- and inspection-related violations than white drivers as a percentage of their total stops. Figure 13.6 illustrates by race and ethnicity the reason officers cited to stop a motor vehicle.

Figure 13. 6: Basis for Traffic Stops



[23] If a stop was made for a reason other than one of the 11 categories listed as the basis for the stop, it is recorded as "other traffic violation." Some examples of stops that might be recorded as "other traffic violation" include a traffic light violation or stop sign violation.

Unfortunately, the way in which data is collected in Rhode Island does not allow a differentiation between equipment and inspection related stops, so these stops can't be separated from each other for analysis. There are a number of different violations that could be categorized as equipment violations, but the most common example is likely a stop made for defective lighting. On the other hand, an inspection violation would only occur if the vehicle was not in compliance with the Rhode Island safety inspection law. All vehicles registered in Rhode Island must have a valid Rhode Island inspection sticker. A vehicle safety and emissions test must be performed at least once every two years. That having been said, 16% (770 stops) of Westerly's stops were made for equipment- or inspection-related violations. This was below the state average of 20% during the study year. Of all the Hispanic drivers stopped in Westerly, 23% (38 stops) of them were stopped for equipment- or inspection-related violations. In addition, 20% (49 stops) of all the black drivers stopped in the town were pulled over for equipment- or inspection-related reasons. This compared to 15% (662 stops) of all white drivers. Conversely, 67% (2,895 stops) of all the white drivers stopped in town were stopped for hazardous driving behaviors (such as speeding and other traffic violations) compared to 63% (153 stops) of black drivers and 59% (98 stops) of Hispanic drivers.

Almost 60% (456 stops) of all equipment or inspection related stops were made in two patrol zones (North and Inside) compared to only 46% of all traffic stops that were made in these same areas. The Inside patrol district is the smallest geographic patrol area, but accounts for the downtown district and harbor area. The North patrol district covers the northern border between Westerly and North Stonington, Connecticut. The southern section of the North patrol area is a high commercial activity area adjacent to the downtown district. The Inside patrol area accounts for 31% (242 stops) of all equipment and inspection related stops and the North patrol area accounts for 28% (214) of these stops. Although the majority of these stops were made in the high enforcement area of town, there were equipment and inspection-related stops made throughout the town. These stops represented a significant percentage of the traffic stops made in many patrol areas, except the Beach area. The frequency and location of these stops in the high enforcement zones in the center of town appears to have had an impact on the size of the disparity affecting both black and Hispanic drivers in Westerly These areas are the busiest corridors in town due to the commercial activity in the area. Black and Hispanic drivers are also stopped in these areas for all violations at a higher rate.

In addition to disparities identified in stops made for equipment/inspection violations, researchers also identified disparities, particularly for black drivers, in stops made for "Other Traffic Violations." If a stop was made for a reason other than one of the 11 categories listed as the basis for the stop, it is recorded as "other traffic violation." Two of the most common reasons a stop might be recorded as "other traffic violation" include a traffic light violation or stop sign violation. Approximately 29% (1,412 stops) of traffic stops were reported as "other traffic violation". Of all the black drivers stopped in Westerly, 34% (83 stops) were stopped for an "other traffic violation". In addition, 28.5% of both Hispanic and white drivers stopped in the town were pulled over for this reason (47 stops and 1,237 stops, respectively). The largest percentage of these stops occurred in the Inside patrol area with 42% of all "other traffic violation" stops. This type of enforcement in the Inside patrol area is unsurprising given the nature of the roadways in this patrol district and the higher concentration of traffic volume, traffic control signals, and stop signs.

Speed enforcement was the largest reason for stopping a motorist in Westerly. There were 1,818 stops made for speeding or 37% of all stops. This was a higher percentage of speed related stops when compared to the statewide average of 30% during the study year. Officers frequently rely on modern technology-based enforcement techniques, like using radar or a laser device, to make speeding stops.

Depending on the types of locations and vehicle travel speeds involved, using technology-based enforcement techniques is sometimes considered to be "blind", that is, the officer may have a reduced opportunity to specifically identify driver characteristics before making a decision to act than with other types of violations where a more direct and frequently prolonged observation of the vehicle is made. At least theoretically, if all speeding stops could be considered blind with respect to predetermination of the drivers' racial characteristics, they could possibly provide a useful if clearly imperfect window into the general racial make-up of drivers driving in an enforcement area.

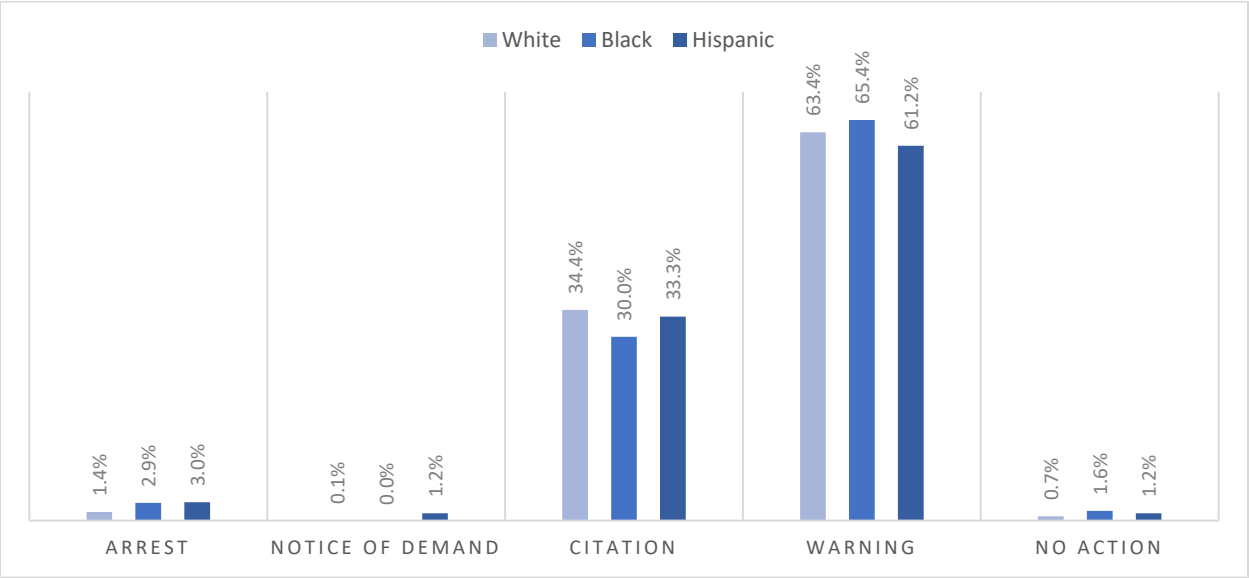
Unfortunately, the data available from Rhode Island does not capture information on technology-based speeding stops. That having been said, we believe it is reasonable to assume that a significant portion of Westerly's speeding stops were probably technology based and provide the following analysis based on that assumption. The demographics for all speed-related stops in Westerly were 3% Hispanic drivers (51 stops), 4% black drivers (70 stops), 2% Asian and other drivers (39 stops), and 91% white drivers (1,658 stops). There was a higher percentage of white drivers stopped for speed-related violations compared to their overall proportion of all other stops made (91% compared to 88%). However, black and Hispanic drivers were stopped at a lower rate for speed-related violations than their overall proportion of all other stops (Black drivers – 4% compared to 6% and Hispanic drivers – 3% compared to 4%.)

The largest number of speed-related stops occurred in the Bradford patrol area. This one patrol area accounted for 33% of all speed-related stops. The demographics for these stops were 1% Hispanic drivers, 4% black drivers, 2% other drivers, and 93% white drivers. There was again a higher proportion of white drivers stopped for speed-related violations in the Bradford patrol area than their proportion of all other stops in the same area (93% compared to 87%). A slightly smaller proportion of black and Hispanic drivers were stopped for speed-related violations in the Bradford area than their proportion of all other stops in that area (Black drivers – 4% compared to 6% and Hispanic drivers – 1% compared to 4%.) If, arguably, speeding stops might represent a better proxy of the actual driving population at any given time than all stops considered together, speeding stops may actually help to mitigate what could be a larger disparity in all stops not related to speed. When the racial demographics of all speed-related stops in a town closely mirror the racial demographics for all stops in town, it could be an indication that police are stopping a representative sample of the actual driving population in town. The racial demographics of speed-related stops in Westerly do not mirror the racial demographics of all stops in town, but the disparity is much smaller.

Outcome of Stops

The majority of motor vehicle stops in Westerly resulted in the driver receiving a warning (63%). When compared to white drivers, black drivers were slightly more likely to receive a warning as a percentage of their total stops. However, Hispanic drivers were less likely to receive a warning than both white and black drivers. Figure 13.7 shows the outcome of motor vehicle stops by race and ethnicity.

Figure 13. 7: Outcome of Traffic Stop



Drivers were significantly more likely to receive a warning as a result of an equipment or inspection violation compared to all other violations. Of the drivers stopped for equipment- and inspection-related violations, 83% resulted in a warning whereas only 60% of stops for all other types of violations resulted in a warning. There were only 7 notice and demands that resulted from a traffic stop. A notice and demand are typically given for non-moving violations when a vehicle has a defect that needs to be addressed. The notice provides the driver with five working days to fix the issue and have the vehicle inspected. Failure to correct the problem results in a review by the traffic court.

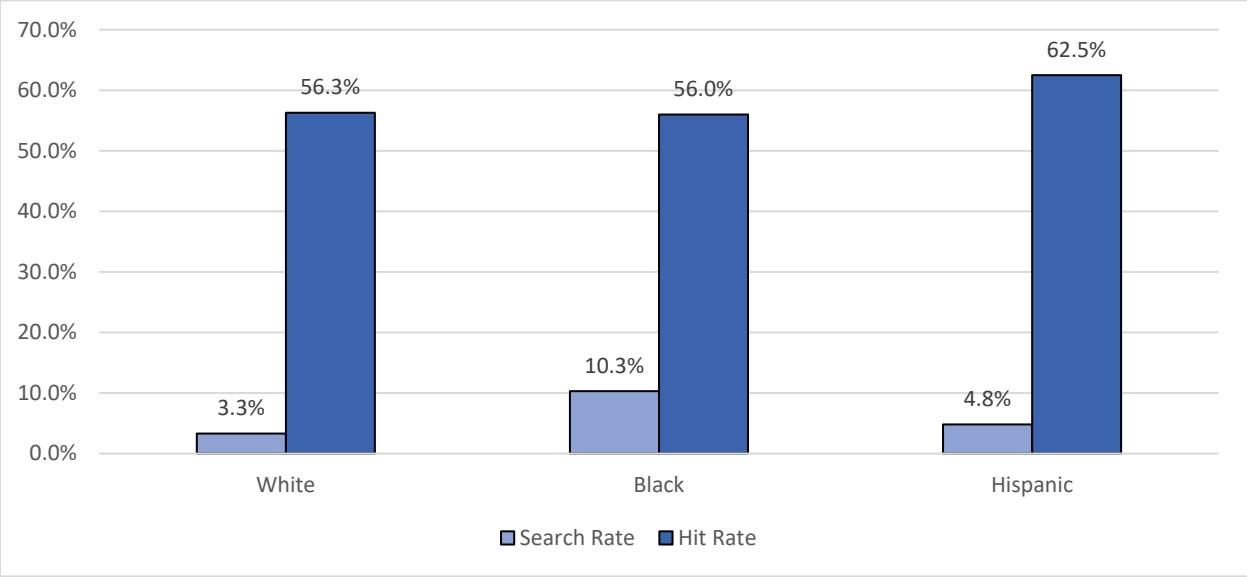
In Westerly, 75 of the stops made resulted in the arrest of either the driver or a passenger (1.3%). This was below the statewide average of 3% for stops resulting in an arrest. Of the 75 arrests, the driver of the vehicle was arrested in 63 cases and the passenger was arrested in 12 cases. The racial demographics of individuals arrested as a result of a traffic stop were 79% white, 9% black, and 7% Hispanic. When considered as a proportion of their total stops, black and Hispanic drivers were almost twice as likely to be arrested compared to white drivers (3% of all black drivers stopped and 3% of all Hispanic drivers stopped compared to 1% of all white drivers stopped). The Inside patrol area had the largest number of arrests following a traffic stop with 23. The North, South, and Bradford area all had a similar number of arrests with 15 or 16 per patrol area.

Unfortunately, we are unable to determine the reason for the arrest but can identify why the vehicle was stopped. Of the 75 arrests, the basis for stopping a vehicle was an “other traffic violation” (17 stops), call for service (16 stops), equipment or inspection violation (11 stops), APB (8 stops), outstanding warrant (8 stops), a registration violation (7 stops), with the remaining arrests for some other reason (8 stops). Stops that were made for what would seem to be more minor traffic-related violations such as equipment or inspection violations, registration violations, speeding and other traffic violations resulted in a higher proportion of minority drivers arrested. It is not possible to determine the reason for the arrest, but it is assumed that a more significant violation was identified that lead to an arrest.

Search Information

A review of department search information shows that 3.8% (184) of the drivers stopped in Westerly were subjected to a motor vehicle search. This rate of motor vehicle searches was equivalent to the state's average. Stops of black drivers resulted in a search at more than three times the rate of white drivers (10.3% black drivers searched compared to 3.3% white drivers). Stops of Hispanic drivers resulted in a search at almost a 30% higher rate than white drivers (4.8% of Hispanic drivers searched compared to 3.3% of white drivers). A search of a motor vehicle is common when a motorist is arrested. Of the 184 motor vehicle searches conducted, only 29 resulted in the arrest of a driver or passenger. Contraband was found at an equivalent rate for searches involving black and white drivers, but a higher rate for Hispanic drivers. However, the overall rate at which contraband was found is higher than the statewide average (56% compared to 41%). Figure 13.8 illustrates the searches and the rate at which contraband was found (the "hit rate").

Figure 13. 8: Search and Hit Rate



XIII.F: 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, areas with high accident rates and 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 some of these factors. Basic information on crime, accidents, and other factors associated with Westerly provide a context to potentially explain the rational for police deployments that are important considerations.

Westerly reported 894 index crimes in 2018, which are eight crimes the FBI combines to produce its annual crime index. The offenses include homicide, forcible rape, robbery, burglary, aggravated assault, larceny over $50, motor vehicle theft, and arson. Of the 894 offenses, 27% (239 offenses) were for larceny, 23% (210 offenses) were for destruction of property or vandalism, 18% (163 offenses) were for assault, 10% (88 offenses) were for drug violations, and the remaining 22% (194 offenses) were for some other

offense. The most offenses occurred in the North patrol area with 35% (315 offenses) of all reported crimes. Of the remaining four patrol areas, the Inside patrol area accounted for 26% (238 offenses), the South patrol area accounted for 20% (176 offenses), the Bradford patrol area accounted 10% (93 offenses), and the Beach patrol area accounted for 9% (78 offenses) of all reported crime in town. Crime data and pattern activity is an integral component of a department's crime control and reduction strategy. Taking into consideration the location of Westerly's overall index crimes in more detail helps to provide a better understanding of what may be leading Westerly officers to be more active in some areas of the town than in others.

The Westerly police department also provided researchers with a summary of dispatch logs or calls for service, which included calls for service and officer-initiated actions that were called in to police dispatch. The logs report approximately 11,000 entries from January 1, 2018 through December 31, 2018. Three roadways accounted for 20% of all records in the dispatch log. Those roadways were Airport Road with 7% of call records (772 records), Post Road with 7% of call records (739 records), and Bradford Road with 6% of call records (626 records). The most call activity also occurred in the Inside patrol area with 25% (2,711 records) of the call records. This was followed by 23% of calls in the South patrol area, 20% in the Bradford area, 17% in the North area, and 15% in the Beach area.

During our study period, there were approximately 819 motor vehicle accidents on roads patrolled by the Westerly Police Department. Accidents were reported as occurring on 106 roads. The roadways with the highest number of accidents were Post Road (107 accidents), Granite Street (73 accidents), Franklin Street (72 accidents), and High Street (53 accidents). There were only 21 roads with 10 or more accidents and those roads account for 77% of all accidents in Westerly. The three roadways with the highest number of accidents are all part of Route 1 (Post Road, Granite Street, and Franklin Street). Route 1 accounted for 31% of all accidents in the town.

XIII.G: Summary of Findings

Researchers identified factors that we believe contributed to the disparity identified in the initial analysis of traffic stops. Areas with the highest call for service volume, the highest crime rates and the highest levels of traffic appear to be some of the same areas with the highest levels of motor vehicle enforcement. Westerly is also a popular tourist destination during the summer months, where it is predicted that the population nearly doubles. There are five well-known beaches in town including, Weekapaug Beach, Westerly Town Beach, Misquamicut State Beach, East Beach and Watch Hill Beach. Our analysis of traffic stops by patrol area confirms that departmental resources are more highly concentrated in the center of the town and in the patrol areas that cover major roadways in including routes 1, 1A, 2, 91, and 78.

Westerly is divided into five patrol areas and for reporting purposes they are referred to as North, Bradford, Inside, South, and Beach. Although the Inside patrol area is the smallest geographic are it accounts for the highest number of traffic stops (26%). This patrol area primarily covers the downtown historic district between the Pawcatuck River and Route 1 from west to east and Pleasant Street to Well Street from north to south. In this patrol area the stop demographics included 11% minority drivers and 89% white drivers. The largest number of minority drivers were stopped in this patrol area. The North patrol area had the largest disparity for black drivers stopped, which is directly adjacent to the Inside patrol area. These two patrol zones accounted for almost 60% of where all black drivers were stopped. On the other hand, the Beach patrol area had the largest disparity for Hispanic drivers stopped. The Beach area is located along the entire southern coastline of Westerly, includes most of the public and private

beaches in town, and has the highest percentage of non-resident drivers stopped compared to all other areas in town. There were also smaller disparities for Hispanic drivers identified in the North and South patrol areas. These three patrol areas account for 53% of where all Hispanic drivers were stopped.

Westerly's traffic stop data also reflects (1) a very low non-white driving age resident population and (2) a relatively large proportion of non-residents who make up the majority of people who were stopped in town. Since 55% of all drivers stopped in Westerly were non-residents, the overall impact out-of-town drivers had on the stop data is fairly clear. Non-resident black and Hispanic drivers were more likely to be stopped than non-resident white drivers. Approximately 60% of black drivers stopped and 62% of Hispanic drivers stopped were not residents, compared to 54% of white drivers who were non-residents. The influence non-resident drivers had on stop demographics affected patrol areas to varying degrees. Non-resident drivers stopped had a greater impact in the Beach and Bradford patrol areas. Almost 70% of all drivers stopped in these areas were not residents of Westerly. On the other hand, less than 50% of all drivers stopped were not residents in the Inside and North patrol areas. Approximately 54% of drivers stopped in the South patrol area were residents of Westerly. The greater impact of out-of-town drivers stopped in the Bradford and Beach patrol areas is unsurprising given that traffic volume increases considerably during the summer months because of local beaches and other summer attractions.

Traffic Stop Outcomes

In Westerly, the three most common reasons used for stopping a motorist make up 82% of the total stops. The three largest stop categories were for speeding violations (37%), Other Traffic Violations[24] (29%), and equipment or inspection violations (16%). 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- and inspection-related violations than white drivers as a percentage of their total stops.

Racial and ethnic disparities were most pronounced in equipment/inspection violations, other traffic violations and speeding violations. Over 20% of black drivers and 23% of Hispanic drivers were stopped for equipment/ inspection violations compared to 15% of white drivers. Conversely, 67% of all the white drivers stopped in town were stopped for hazardous driving behaviors (such as speeding and other traffic violations) compared to 63% of black drivers and 59% of Hispanic drivers. The data shows that, with respect to the racial and ethnic demographics of those stopped for equipment- or inspection-related stops are closely related to the frequency and location of where the stops are made. A majority of these stops were made in two of the high enforcement patrol zones (Inside and North). The frequency and location of these stops in the high enforcement zones in the center of town appears to have had an impact on the size of the disparity affecting both black and Hispanic drivers in Westerly These areas are the busiest corridors in town due to the commercial activity in the area. Black and Hispanic drivers are also stopped in these areas for all violations at a higher rate.

Disparities were also identified, particularly for black drivers, in stops made for "Other Traffic Violations." Two of the most common reasons a stop might be recorded as "other traffic violation" include a traffic

[24] If a stop was made for a reason other than one of the 11 categories listed as the basis for the stop, it is recorded as "other traffic violation." Some examples of stops that might be recorded as "other traffic violation" include a traffic light violation or stop sign violation.

light violation or stop sign violation. Approximately 29% of traffic stops were reported as “other traffic violation”. The largest percentage of these stops occurred in the Inside patrol area with 42% of all “other traffic violation” stops. This type of enforcement in the Inside patrol area is unsurprising given the nature of the roadways in this patrol district and the higher concentration of traffic volume, traffic control signals, and stop signs. Black drivers were also significantly more likely to be stopped in the Inside patrol areas. The frequency and location of these stops in the Inside patrol area appears to have had an impact on the disparity for black drivers.

Speed enforcement was also a significant basis for traffic stops and accounted for 37% of all stops. Officers frequently rely on modern technology-based enforcement techniques, like using radar or a laser device, to make speeding stops. Using technology-based enforcement techniques is sometimes considered to be “blind”, that is, the officer may have a reduced opportunity to specifically identify driver characteristics before deciding to stop a vehicle. The largest number of speed-related stops occurred in the Bradford patrol area. This one patrol area accounted for 33% of all speed-related stops. The demographics for these stops were 1% Hispanic drivers, 4% black drivers, 2% other drivers, and 93% white drivers. A higher proportion of white drivers stopped for speed-related violations in the Bradford patrol area than their proportion of all other stops in the same area. At least theoretically, if all speeding stops could be considered blind with respect to predetermination of the drivers’ racial characteristics, they could possibly provide a useful if clearly imperfect window into the general racial make-up of drivers driving in an enforcement area. The racial demographics of all speed-related stops in Westerly more closely mirrored the racial demographics for all stops in town. Of the drivers stopped for speeding, 91% were white, 4% were black and 3% were Hispanic. When the racial demographics of all speed-related stops in a town closely mirror the racial demographics for all stops in town, it could be an indication that police are stopping a representative sample of the actual driving population in town. Although the racial demographics of speed-related stops in Westerly do not mirror the racial demographics of all stops in town, but the disparity is much smaller.

Regarding stop outcomes, the majority of vehicle stops in Westerly resulted in the driver receiving a warning. Black drivers were slightly more likely to receive a warning as a result of a stop. Hispanic drivers were more likely to be arrested and receive a notice of demand than white or black drivers. Drivers were significantly more likely to receive a warning as a result of an equipment or inspection violation. Since black and Hispanic drivers were more likely to be stopped for equipment or inspection violations it is unsurprising that there would also be a disparity in the stop dispositions (i.e. black drivers receiving warnings and Hispanic drivers receiving notice of demand at a higher rate than white drivers).

Westerly police searched 3.8% of the drivers they stopped, which was equivalent to the state average. Black drivers were searched at three times the rate of white drivers, and Hispanic drivers were searched at almost a 30% higher rate than white drivers. The overall rate at which contraband was found is higher than the statewide average. Contraband was also found at an equivalent rate for searches involving black and white drivers, but a higher rate for Hispanic drivers. When Westerly’s search data was analyzed using a more sophisticated statistical test, no racial and ethnic disparities were identified. Given the results from the statistical test that was conducted, no meaningful conclusions should be drawn from the descriptive statistics provided in this report.

Conclusion

Taken as a whole, the Westerly traffic stop data reflects the influence of the Inside and North patrol areas that appear to be somewhat more diverse than the predominantly white resident driving age population. These patrol areas appear to have a relatively high level of enforcement and a relatively higher proportion of both resident and non-resident minority drivers traveling them. Both patrol areas are major traffic generators for the town with areas that have large commercial activity. The Beach patrol area also appears to impact the overall disparities for the town. Seasonal attractions such as public beaches change the racial and ethnic make-up of this area, particularly in the summer months. These high enforcement patrol areas also mirror where the highest call for service volume, the highest crime rates and the highest levels of traffic occur.

After a full review, the disparities do not appear excessive in nature. However, in the future if the department should see racial and ethnic disparities increase from the level established in this report, it is recommended that the department:

(1) review its traffic enforcement policies in the Inside and North patrol area in order to evaluate the extent to which they may have a disproportionate effect on black and Hispanic drivers and
(2) evaluate both the location and frequency of stops that involve equipment- or inspection-related motor vehicle violations and other traffic violations, to better understand the impact they may be having on minority drivers.

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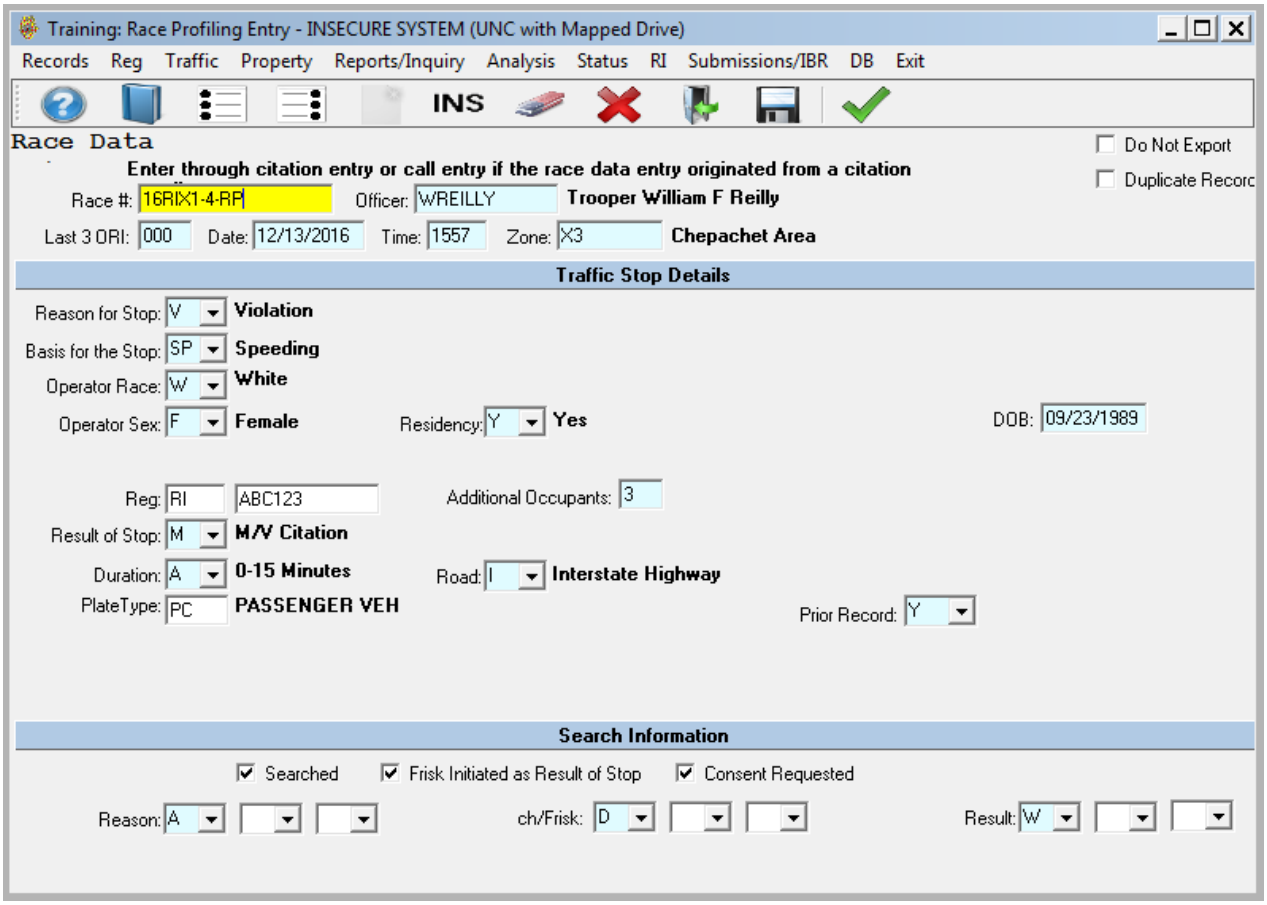
APPENDIX A

A.1: DEPARTMENT DATA COLLECTION MODULE

Figure A.1 is a screenshot of the module used by Rhode Island police departments for collecting traffic stop records.

Figure A.1: Data Collection Module Screenshot



A.2: METHODOLOGY FOR THE SOLAR VISIBILITY TEST

Following Grogger and Ridgeway (2006), let the parameter K_{ideal} capture the true level of disparate treatment for minority group *m* relative to majority group *w:*

$$K_{ideal} = \frac{P(S|V', m)P(S|V, m)}{P(S|V', w)P(S|V, w)} \quad (1)$$

The parameter captures the odds that a minority motorist is stopped during perfect visibility (V') relative to those in complete darkness (V). The parameter $K_{ideal} = 1$ in the absence of discrimination and $K_{ideal} > 1$ when minority motorists face adverse treatment.

Applying Baye's rule to Equation 1 such that:

$$K_{ideal} = \frac{P(m|V', S)P(w|V, S)}{P(w|V', S)P(m|V, S)} * \frac{P(m|V)P(w|V')}{P(w|V)P(m|V')} \quad (2)$$

The first term in K_{ideal} is the ratio of the odds that a stopped motorist is a minority during daylight relative to the same odds in darkness. Unlike Equation 1 which would detailed data on roadway demography, the odds ratio in Equation 2 can be estimated using data on stop outcomes. The second term in K_{ideal} is a measure of the relative risk-set of motorists on the roadway which captures any differences in the demographic composition of motorists associated with visibility. The second term will be equal unity if the composition of motorists is uncorrelated with visibility.

Assuming that the risk-set of motorists is uncorrelated with variation in visibility, a test statistic for K_{ideal} is then simply:

$$K_{vod} = \frac{P(m|S, \delta = 1)P(w|S, \delta = 0)}{P(w|S, \delta = 1)P(m|S, \delta = 0)} \quad (3)$$

Since we do not have continuous data on visibility, the variable δ is a binary indicator representing daylight.

The test statistic K_{vod} will be greater than or equal to the parameter K_{ideal} and exceed unity if the following conditions hold:

1) $K_{ideal} > 1$; The true parameter shows that there is a racial or ethnic disparity in the rate of minority police stops.
2) $P(V|\delta = 0) < P(V|\delta = 1)$; Darkness reduces the ability of officers to discern the race and ethnicity of motorists.
3) $\frac{P(m|V)P(w|V')}{P(w|V)P(m|V')} = 1$; The relative risk-set is constant across the analysis window.

Estimating the test statistic K_{vod} does not provide a quantitative measure for evaluating disparate treatment in policing data but does qualitatively identify the presence of disparate treatment. More

concretely, the test identifies the presence of a racial or ethnic disparity if the test statistic K_{vod} is greater than one. Given the restrictive nature of the test statistic, it is reasonable (but not conclusive) to attribute the existence of this disparity to racially biased policing practices.

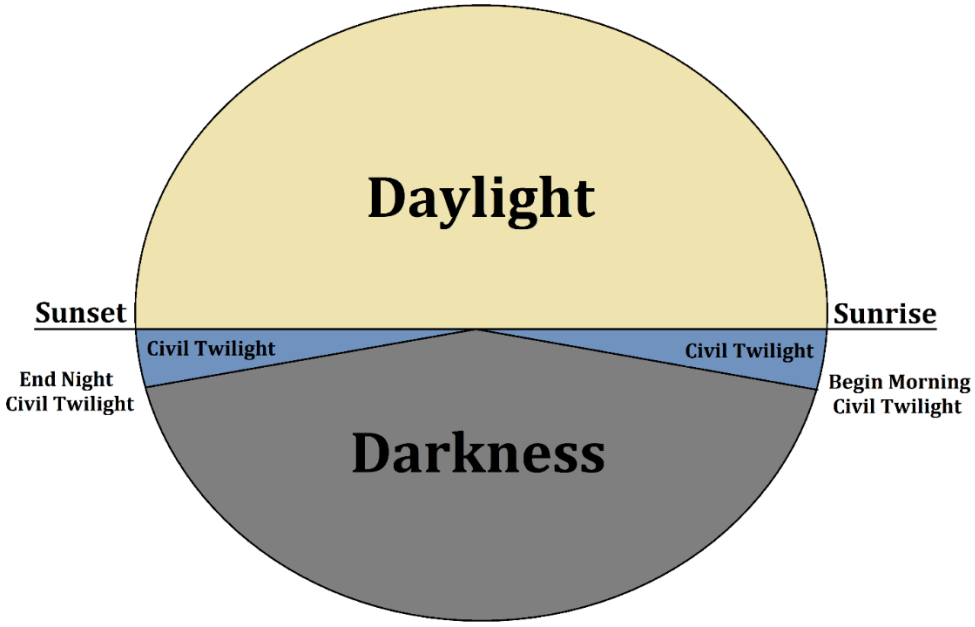
Assuming that the assumptions outlined above hold, Equation 4 can be estimated using a logistic regression in the following form:

$$ln\left(\frac{P(m|\delta)}{1-P(m|\delta)}\right) = \beta_0 + \delta + \mu \quad (4)$$

In practice, it is unlikely that the third assumption (a constant relative risk-set) will hold without including additional controls in Equation 4. Thus, we amend Equation 4 by including controls for time of day (indicators capturing 15 minute intervals), day of week, and statewide daily traffic stop volume. In estimates using data from all departments across the state, we also include department fixed-effects. The aggregate three-year sample also allows for the inclusion of officer fixed-effects.

The analysis requires that periods of darkness and daylight be properly identified. Following Grogger and Ridgeway (2006), the analysis is restricted to stops made within the inter-twilight window- that is, the time between the earliest sunset and latest end to civil twilight. As is shown in Figure A.2 (1), civil twilight is defined as the period when the sun is between zero and six degrees below the horizon and where its luminosity is transitioning from daylight to darkness. The motivation for limiting the analysis to the inter-twilight window is to help control for possible differences in the driving population.

Figure A.2 (1): Diagram of Civil Twilight and Solar Variation

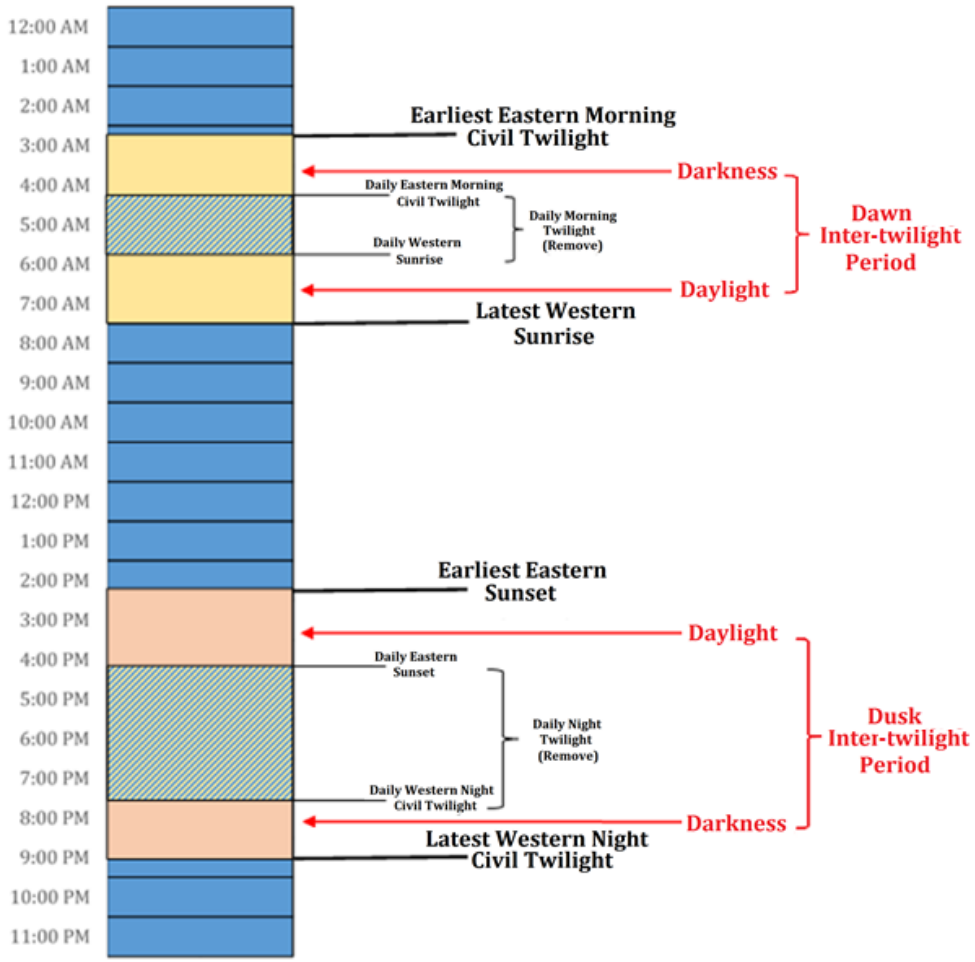


In this analysis, we rely primarily on a combined inter-twilight window that includes traffic stops made at both dawn and dusk. The dawn inter-twilight window is constructed from astronomical data and occurs in the morning hours. The dusk inter-twilight window, on the other hand, is constructed from the same astronomical data but occurs in the evening hours. The combined inter-twilight window relies on a sample

that is created by pooling these timeframes and including an additional control variable that identifies the period. The inter-twilight window was identified by attaching astronomical data from the United States Naval Observatory (USNO) to the traffic stop data. As discussed previously, past applications of this method have focused on single large urban geographies and have had no need to consider the possibilities of differential astronomical impacts. The definition for both the dawn and dusk inter-twilight windows was amended to accommodate cross-municipal variation by utilizing data from the easternmost (Newport, RI) and westernmost (Westerly, RI) points available in the USNO data.

The USNO data was merged with the policing data and used to identify the presence of darkness. Again, the presence of darkness was the primary explanatory variable used to identify the presence of racial disparities in the Rhode Island policing data. As a result, any observation in the data that occurred during twilight on any given day were dropped. The twilight period varied on a daily basis throughout the year and was identified using the USNO data. Twilight was defined in the dawn inter-twilight window as the time between the daily eastern start of civil twilight and western sunrise. Similarly, twilight was defined in the dusk inter-twilight window as the time between the daily eastern sunset and western end to civil twilight. The full delineation of the policing data is displayed graphically in Figure A.2 (2).

Figure A.2 (2): Delineation of Inter-twilight windows



A.3: METHODOLOGY FOR THE SYNTHETIC CONTROL TEST

Rosenbaum and Rubin (1983) characterize the propensity score as the probability of assignment to treatment conditional on pretreatment variables. The key insight is that conditional on this scalar function, assignment to treatment will be independent of the outcome variable. Simply put, given some *observed* pretreatment variables, it is possible to identify the conditional probability of treatment. Correctly adjusting for this conditional probability allows for the bias associated with *observed* covariates to be statistically controlled. If these observed covariates are correlated with unobserved variables, these confounding factors will also be controlled for statistically. This methodology allows for a causal interpretation of the difference between outcomes associated with treatment and control.

Hirano et al. (2003) note that a useful adjustment is to weight observations according to their propensity scores. This adjustment effectively creates a balanced sample among treatment and control observations. Conveniently, when the estimate of interest is the treatment effect on the treated, only potential control observations need to be weighted. In this context, the weight that balances the sample and removes bias associated with pretreatment confounding factors is exactly the inverse of the propensity score. Ridgeway and MacDonald (2009) apply this technique in the context of policing data by matching the joint distribution of a particular officer's stop features to those by other officers. The analysis proceeds by extending this technique for the purposes of developing synthetic controls of municipal police departments using microdata on police stops in combination with U.S. Census Bureau data on demographic and employment characteristics.

We begin using the dataset of *k* demographic and employment characteristics for county subdivision *j* in Rhode Island. This set of variables also contains characteristics including: the racial and ethnic composition of the town, age and gender demographics, population size, land area, population density, housing characteristics, commuter patterns, employment in retail and entertainment sectors, and the aggregate racial and ethnic composition of all contiguous towns. A detailed list of the stop-specific and town-level characteristics can be found in Appendix C, Table 28a. We then applied principal components analysis to reduce dimensionality and assure orthogonality. Components were selected using Guttman-Kaiser's stopping rule, which suggests only keeping those with an Eigen value of 1.2 or larger.

Formally, the *i'th* loading factor is simply:

$$w_{(i)} = \underset{\|w\| = 1}{\arg max} \left\{ \sum_k \left[w \cdot x_j \right]^2 \right\}. \quad (5)$$

Indices were then constructed for each component satisfying Guttman-Kaiser's stopping rule where:

$$y_{j,(i)} = \sum_k w_{(i)} x_j \quad (6)$$

Next, we attach the components capturing residential demographic and economic characteristics to the traffic stop data. We then conduct a second principal components analysis using variables from the traffic stop data itself, again to reduce dimensionality and ensure orthogonality. Traffic stop characteristics

include time of the day, day of the week, month, department traffic stop volume, officer traffic stop volume, and type of traffic stop.

We then estimate propensity scores for each *j* department using a logistic regression of the form:

$$ln\left(\frac{F(j)}{1-F(j)}\right) = \beta_0 + \sum_i y_{j,(i)} \quad (7)$$

Propensity score p_j are used to construct weights $w_i = 1$for the department of interest (i.e. the treatment group) and equal to $w_i = p_j/(1-p_j)$ for stops made in all other departments. Applying a propensity score weight to stops made by other departments in the state creates a synthetic control group with a comparable distribution of stop-specific and town-level characteristics. The propensity score and resulting weight for those stops with characteristics that are drastically different than stops made by the department of interest will approach zero. As a result, the synthetic control will consist of the stops that are similar, in terms of stop-specific and town-level characteristics, to those made by the department of interest. The construction of a synthetic control group using propensity scores allows the comparison to reflect the average treatment effect on the treated and abstract from potential bias in so far as the observable covariates control for selection into treatment.

Hirano and Imbens (2001) extend the weighting framework to what Robins and Ritov (1997) refer to as doubly robust estimation. That is, including additional covariates to a semi-parametric least-squares regression model enables capture of a more precise estimate of the treatment effect. It is shown in both of these discussions that such an estimator is consistent if either of the models is specified correctly. Ridgeway and MacDonald (2009) further extend the doubly robust propensity score framework to policing data. Specifically, the authors look at whether the department of interest deviates from the synthetic control along the outcome dimension. Here, we provide estimates with and without so called doubly-robust estimation of treatment effects.

Treatment effects are estimated using a logistic regression of the form:

$$ln\left(\frac{F(m)}{1-F(m)}\right) = w_i\left(\beta_0 + t(j) + \sum_i y_{j,(i)}\right) \quad (8)$$

Where $t(j)$ is an indicator of treatment and $\sum_i y_{j,(i)}$ is a series of covariates included in the propensity score where the dimensionality has been reduced using principle components. If a particular department is designated as a treatment to a group of stops, it follows that the outcome of interest would be motorist race. The question is then simply, does the intervention by a particular department result in a relatively higher stop rate of minority motorists, controlling for all observable factors? Combining inverse propensity score weighting with regression analysis allows for a more precise answer to this question. In the circumstance where the synthetic control and individual department do not perfectly match along all dimensions of stop features, there is potential for bias in any comparison, especially if those features by which they differentiate relate to a motorist's race. Doubly robust estimation helps to remove this source of potential bias by controlling for these features, resulting in a much more accurate department effect.

The share of minority motorists stopped within a department was evaluated through a direct comparison with a unique synthetic control.

Table A.3: Variables Included in Synthetic Control Methodology

Variable	Primary Town		Border Town	
	Percent	Count	Percent	Count
Male 18 to 24	X			
Male 25 to 34	X			
Male 35 to 54	X			
Male 55 to 64	X			
Male > 65	X			
Female 18 to 24	X			
Female 25 to 34	X			
Female 35 to 54	X			
Female 55 to 64	X			
Female 65+	X			
Total Population		X		X
White Population		X		X
Hispanic Population		X		X
Black Population		X		X
Asian + P.I. + N.A. Population		X		X
Other Population		X		X
Labor Force Participation	X			
Employment Rate	X			
Commute Alone	X			
Commute Carpool	X			
Commute Public Transit	X			
Commute Walk	X			
Income < 25k	X			
Income 26k to 50k	X			
Income 51k to 75k	X			
Income 76k to 100k	X			
Income 101k to 150k	X			
Income > 150k	X			
Employment Retail		X		
Employment Entertainment		X		
Vacant Housing		X		
Land Area		X		
Population Density		X		

Note 1: The source of all variables is the Census Bureau's 2016 American Community Survey 5 year estimates.
Note 2: Composite variables for border towns are constructed as weighted means where the weights are the length of each border segment.

A.4: DESCRIPTIVE STATISTICS METHODOLOGY

This section presents the methodology used to compare department-level data and three population based benchmarks commonly used across the country: (1) statewide average, (2) estimated commuter driving population, and (3) resident population. Although any one of these benchmarks cannot provide by itself a rigorous enough analysis to draw conclusions regarding racial profiling, if taken together with the more rigorous statistical methods, they do help to highlight those jurisdictions where disparities are significant and may justify further analysis. Any benchmark approach contains implicit assumptions that must be recognized and understood. The implicit assumptions are outlined in an effort to provide transparency to this research process.

A.4 (1): Problems with Approaches Using Traditional Benchmarks

A traditional approach to evaluating racial and ethnic disparities in policing data has been to apply population-based benchmarks. Although these benchmarks vary in their construction, the general methodology is consistent. Typically, the approach amounts to using residential data from the U.S Census Bureau to compare with the rate of minority traffic stops in a given geographic jurisdiction. In recent years, researchers have refined this approach by adjusting the residential census data to account for things like commuter sheds, access to vehicles, and differences over time. The population-based benchmark is an appealing approach for researchers and policymakers both because of its ease of implementation and intuitive interpretation. There are, however, numerous implicit assumptions that underlie the application of these benchmarks and are seldom presented in a transparent manner.

The goal of this analysis is to evaluate racial and ethnic disparities in the Rhode Island policing data using (1) intuitive measures that compare the data against uniformly applied benchmarks and (2) sophisticated econometric techniques that compare the data against itself without relying on benchmarks. The goal of this section is to clearly outline the assumptions that often accompany traditional benchmarks. We do, however, present two nontraditional benchmarks in this chapter that develop a more convincing approximation and can be used to descriptively assess the data. By presenting these benchmarks alongside our more econometric methods, we provide the context for our findings. In addition, the descriptive data presents jurisdictional information in cases where samples may be too small to provide statistically meaningful results from the more stringent tests.

Although there are a number of examples, the most prominent application of a population-based benchmark is a study by the San Jose Police Department (2002) that received a great deal of criticism. A more recent example is a report by researchers from Northeastern University (McDevitt et al. 2014) using Rhode Island policing data. Although adjusted and unadjusted population-based benchmarks can be intuitively appealing, they have drawn serious criticism from academics and policymakers alike because of the extent to which they are unable to account for all of the possible unobserved variables that may affect the driving population in a geography at any given time (Walker 2001; Fridell 2004; Persico and Todd 2004; Grogger and Ridgeway 2006; Mosher and Pickerill 2012). In an effort to clarify the implicit assumptions that underlie these approaches, an informal discussion of each is presented.

The implicit assumption that must be made when comparing the rate of minority stops in policing data to a population-based (or otherwise constructed) benchmark include the following.

Destination Commuter Traffic

The application of population-based benchmarks does not account for motorists who work but do not live in a given geography. Again, the application of population-based benchmarks implicitly assumes that the demographic distribution of destination commuter traffic, on average, matches the population-based benchmark. This assumption is trivial for geographies with low levels of industrial or commercial development where destination commuter traffic is small. On the other hand, areas with a high level of industrial or commercial development attract workers from neighboring geographies and this assumption becomes more tenuous. This differential impact creates a non-random distribution of error across geographies. While this shortcoming is impossible to avoid using population-based analysis, McDevitt et al. (2004) made a notable effort to adjust static residential population demographics by creating an "estimated driving populations" for jurisdictions in Rhode Island.

Pass-through Commuter Traffic

A small but not insubstantial amount of traffic also comes from pass-through commuters. Although most commuter traffic likely occurs via major highways that form the link between origin and destination geographies, the commuter traffic in some towns likely contains a component of motorists who do not live or work in a given geography but must travel through the area on their way to work. As in the previous case, the application of a population-based benchmark must implicitly assume that the demographic distribution of these motorists matches the population-based benchmark. The distribution of error associated with this assumption is, again, very likely non-random. Specifically, it seems likely that a town's proximity to a major highway may impact the level of pass-through commuter traffic from geographies further away from the major highway and, as a result, affect the magnitude of the potential error. Unfortunately, little useful data exists to quantify the extent to which this affects any particular jurisdiction. Alternatives that survey actual traffic streams are prohibitively expensive and time-consuming to conduct on a statewide basis and, unfortunately, are subject to their own set of implicit assumptions that can affect distribution of error.

Recreational Traffic

Surges in recreational traffic are not accounted for in evaluation methods that utilize population-based benchmarks. In order to apply population-based benchmarks as a test statistic, it must be implicitly assumed that the demographic distribution of recreational traffic, on average, matches the population-based benchmark. Although these assumptions are not disaggregated as with commuter traffic above, this assumption must apply to both destination and pass-through commuter traffic. Although the assumption is troublesome on its face, it becomes more concerning when considering the distribution of the associated error during specific seasons of the year. Specifically, recreational traffic likely has a differential effect across both geographic locations and over time.

Differential Exposure Rates

The exposure rate can be defined as the cumulative driving time of an individual on the road. The application of a population-based benchmark must implicitly assume that exposure rates are, on average, equivalent across demographic groups. Although exposure rates may differ based on cultural factors like driving behavior, there are also many more factors that play an important role. An example might be the differences in age distribution across racial demographics. If a specific minority population is, on average,

younger, and younger motorists have a greater exposure rate than older motorists; then one might falsely attribute a racial or ethnic disparity across these groups when there is simply a different exposure to law enforcement. Although census-based estimation methods exist to apply these demographically based exposure differences to a given population, they are best suited to situations where a single or very limited number of jurisdictions must be analyzed.

Temporal Controls

The lack of temporal controls in population-based benchmarks does not account for differences in the rate of stops across different times and days in the week. Assuming, that the above four assumptions hold and the population-based benchmark is representative of the demographic distribution of the driving population, then temporal controls are not an issue. However, if any of these assumptions do not hold, the lack of temporal controls may further magnify potential bias. Imagine that we believe the only assumption pertaining to exposure rates is invalid. It seems plausible that younger motorists are more likely to drive on weekend evenings than older motorists. If more stops were being made on weekend evenings than during the week and, as described above, minority groups were more prevalent in younger segments of the population, we might observe a racial or ethnic disparity simply because population-based benchmarks do not control for these temporal differences in policing patterns.

When one or more of the implicit assumptions associated with a population-based benchmark is violated, it can become a biased test statistic of racial disparities in policing data. Furthermore, since the source and direction of any such bias are unknown, it is impossible to determine if the bias is positive or negative, thus creating the potential for both type one (false positive) and two error (false negative). Further, the bias also is likely to be non-random across different geographies within the state. It might be that the bias disproportionately impacts urban areas compared to rural areas, tourist destinations compared to non-tourist destinations, geographies closer to highways, or based on similar policing patterns.

The question then becomes: If the assumptions inherent in population-based benchmarks make them less than ideal as indicators of possible bias, why include them in a statewide analysis of policing data? One answer is that excluding them as part of a multi-level analysis guarantees only that when others inevitably use these measures as a way to interpret the data, it is highly likely to be done inappropriately. Comparing a town's stop percentages to its residential population may not be a good way to draw conclusions about its performance but, in the absence of better alternatives, it inevitably becomes the default method for making comparisons. Providing an enhanced way to estimate the impact commuters have on the driving population and primarily analyzing the stops made during the periods of the day when those commuters are the most likely to be a significant component of the driving population improves that comparison.

Another answer to the question is that the population-based and other benchmarks are not used as indicators of bias, but rather as descriptive indicators for understanding each town's data. Since the purpose of this study is to uniformly apply a set of descriptive measures and statistical tests to all towns in order to identify possible candidates for more targeted analysis, having a broad array of possible applicable measures enhances the robustness of the screening process. Relying solely on benchmarking to accomplish this would not be effective, but using these non-statistical methods to complement and enhance the more technical evaluation results in a report that examines the data from many possible angles.

The third answer to the question is that the benchmarks and intuitive measures developed for this study can be useful in cases where an insufficient sample size make it difficult to draw meaningful conclusions from the formal statistical tests. The descriptive measures can serve a supportive role in this regard.

A.4 (2): Statewide Average Comparison

Although it is relatively easy to compare individual town stop data to the statewide average, this can be misleading if done without regard to differences in town characteristics. If, for example, the statewide average for a particular racial category of motorists stopped was 10 percent and the individual data for two towns was 18 percent and 38 percent respectively, a superficial comparison of both towns to the statewide average might suggest that the latter town, at 38 percent, could be performing less satisfactorily. However, that might not actually be the case if the town with the higher stop percentage also had a significantly higher resident population of driving age people than the statewide average. It is important to establish a context within which to make the comparisons when using the statewide average as a descriptive benchmark.

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. Although these comparisons are inevitable and have a significant intuitive appeal, the reader is cautioned against basing any conclusions about the data exclusively upon this measure.

The method chosen to make the statewide average comparison is as follows:

- The towns that exceeded the statewide average for the three racial categories being compared to the state average were selected.
- The amount that each town's stop percentage exceeded the state average stop percentage was determined.
- The amount that each town's resident driving age population exceeded the state average for the racial group being measured was determined.
- The net differences in these two measures were determined and used to assess orders of magnitude differences in these factors.

While it is clear that a town's relative proportion of driving age residents in a racial group is not, in and of itself, capable of explaining differences in stop percentages between towns, it 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. To provide additional context, two additional factors were identified: (1) if the town shares a border with one or more towns whose age 16 and over resident population for that racial group exceeds the state average and (2) the percentage of nonresident motorists stopped for that racial group, in that town.

A.4 (3): Estimated Commuter Driving Population Comparison

Adjusting "static" residential census data to approximate the estimated driving demographics in a particular jurisdiction provides a more accurate benchmark method than previous census-based approaches. At any given time, nonresidents may use any road to commute to work or travel to and from entertainment venues, retail centers, tourist destinations, etc. in a particular town. It is impossible to account for all driving in a community at any given time, particularly for the random, itinerant driving trips sometimes made for entertainment or recreational purposes. However, 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 methodology is an estimate of the composition of the driving population during typical commuting hours.

Previously, the most significant effort to modify census data was conducted by Northeastern University's Institute on Race and Justice. The institute created the estimated driving population (EDP) model for traffic stop analyses in Rhode Island and Massachusetts. A summary of the steps used in the analysis is shown below in Table A.3 (1).

Table A.4 (1): Northeastern University Institute on Race and Justice Methodology for EDP Models in Rhode Island and Massachusetts

Step 1	Identify all the communities falling within a 30 mile distance of a given target community. Determine the racial and ethnic breakdown of the resident population of each of the communities in the contributing pool.
Step 2	Modify the potentially eligible contributing population of each contributing community by factoring in (a) vehicle ownership within the demographic, (b) numbers of persons within the demographic commuting more than 10 miles to work, and (c) commuting time in minutes. The modified number becomes the working estimate of those in each contributing community who may possibly be traveling to the target community for employment.
Step 3	Using four factors, (a) percentage of state employment, (b) percentage of state retail trade, (c) percentage of state food and accommodation sales, and (d) percentage of average daily road volume, rank order all communities in the state. Based on the average of all four ranking factors, place all communities in one of four groups thus approximating their ability to draw persons from the eligible nonresident pool of contributing communities.
Step 4	Determine driving population estimate for each community by combining resident and nonresident populations in proportions determined by which group the community falls into as determined in Step 3. (Range: 60% resident/40% nonresident for highest category communities to 90% resident/10% nonresident for lowest ranking communities)

Although the EDP model created by Northeastern University is a significant improvement in creating an effective benchmark, limitations of the census data at the time required certain assumptions to be made about the estimated driving population. They used information culled from certain transportation planning studies to set a limit to the towns they would include in their potential pool of nonresident commuters. Only those towns located within a 30 minute driving time of a target town were included in the nonresident portion of the EDP model. This approach assumed only those who potentially could be drawn to a community for employment, and did not account for how many people actually commute. Retail, entertainment, and other economic indicators were used to rank order communities into groups to determine the percentage of nonresident motorists to be included in the EDP. A higher rank would lead to a higher percentage of nonresidents being included in the EDP.

Since development of the Northeastern University model, significant enhancements were made to the U.S. Census Bureau data. It is now possible to get more nuanced estimates of those who identify their employment location as somewhere other than where they live. Since the 2004 effort by Northeastern University to benchmark Rhode Island and Massachusetts' data, the Census Bureau has developed new tools that can provide more targeted information that can be used to create a more useful estimated driving population for analyzing weekday daytime traffic stops.

The source of this improved data is a database known as the LEHD Origin-Destination Employer Statistics (LODES). LEHD is an acronym for "Local Employer Household Dynamics" and is a partnership between the U.S. Census Bureau and its partner states. LODES data is available through an online application called *OnTheMap* operated by the Census Bureau. The data estimates where people work and where workers live. The partnership's main purpose is to merge data from workers with data from employers to produce a collection of synthetic and partially synthetic labor market statistics including LODES and the Quarterly Workforce Indicators.

Under the LEHD Partnership, states agree to share Unemployment Insurance earnings data and the Quarterly Census of Employment and Wages data with the Census Bureau. The LEHD program combines the administrative data, additional administrative data, and data from censuses and surveys. From these data, the program creates statistics on employment, earnings, and job flows at detailed levels of geography and industry. In addition, the LEHD program uses this data to create workers' residential patterns. The LEHD program is part of the Center for Economic Studies at the U.S. Census Bureau.

It was determined that the data available through LODES, used in conjunction with data available in the 2010 census, could provide the tools necessary to create an advanced EDP model. The result was the creation of an individualized EDP for each of the 39 towns in Rhode Island that reflects, to a certain extent, the estimated racial and ethnic demographic makeup of all persons identified in the data as working in the community but residing elsewhere. Table A.3 (2) shows the steps in this procedure.

Table A.4 (2): Central Connecticut State University Institute for Municipal and Regional Policy Methodology for EDP Model in Rhode Island

Step 1	For each town, LODES data was used to identify all those employed in the town but residing in some other location regardless of how far away they lived from the target community.
Step 2	ACS* five-year average estimated data was used to adjust for individuals commuting by some means other than driving, such as those using public transportation.
Step 3	For all Rhode Island towns contributing commuters, racial and ethnic characteristics of the commuting population were determined by using the jurisdictions' 2010 census demographics.
Step 4	For communities contributing more than 10 commuters who live outside of Rhode Island, racial and ethnic characteristics of the commuting population were determined using the jurisdictions' 2010 census demographics.
Step 5	For communities contributing fewer than 10 commuters who live outside of Rhode Island, racial and ethnic characteristics of the commuting population were determined using the demographic data for the county in which they live.
Step 6	The numbers for all commuters from the contributing towns were totaled and represent the nonresident portion of the given town's EDP. This was combined with the town's resident driving age population. The combined nonresident and resident numbers form the town's complete EDP.
Step 7	To avoid double counting, those both living and working in the target town were counted as part of the town's resident population and not its commuting population.

*American Community Survey, U.S. Census Bureau

Structured in this way, each town's EDP should reflect an improved estimate of the racial and ethnic makeup of the driving population who might be on a municipality's streets at some time during a typical weekday/daytime period. The more sophisticated methodology central to the LODES data should make

this EDP, even with its inherent limitations, superior to previous uses of an EDP model. To an extent, it mirrors the process used by the Census Bureau to develop from ACS estimates the commuter-adjusted daytime populations (estimates of changes to daytime populations based on travel for employment) for minor civil divisions in several states, including Rhode Island. This type of data is subject to a margin of error based on differing sample sizes and other factors.

It is important to understand that the EDPs used in this report are a first attempt to use this tool in assessing traffic stop data. Much of the data used to create the EDPs comes from the same sources the Census Bureau used to create its commuter-adjusted daytime population estimates so it is reasonable to expect a similar range in the margins of error in the EDP. While the limitations of the model must be recognized, its value as a new tool to help understand some of the traffic stop data should not be dismissed. It represents a significant improvement over the use of resident census demographics as an elementary analytical tool and can hopefully be improved as the process of analyzing stop data progresses.

It was determined that a limited application of the EDP can be used to assess stops that occur during typical morning and evening commuting periods, when the nonresident workers have the highest probability of actually being on the road. Traffic volume and populations can change significantly during peak commuting hours. For example, Providence has a predominately Minority resident population (57 percent). According to *OnTheMap*, 88,949 people work in Providence, but live somewhere else and we are estimating that about 86 percent of those people are likely to be white. Based on the total working population it is reasonable to assume that the daytime driver population would change significantly due to workers in Providence. According to the ACS Journey to Work survey, over 70 percent of Rhode Island residents travel to work between 6:00am and 10:00am. The census currently does not have complete state level data on residents' travel from work to home. In the areas where evening commute information is available, it is consistently between the hours of 3:00pm and 7:00pm. In addition to looking at census information to understand peak commuting hours, the volume of nonresident traffic stops in several Rhode Island communities was also reviewed, based on our theory that the proportion of nonresidents stopped should increase during peak commuting hours.

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). 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. 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.

A.4 (4): Resident Only Stop Comparison

Some questioned the accuracy of the estimated driving population. As a result, we have limited the next part of the analysis to stops involving only residents of the community and compared them to the community demographics based on the 2010 decennial census for residents age 16 and over.

While comparing resident-only stops to resident driving age population eliminates the influence out-of-town motorists on the roads at any given time may be having on a town's stop data, the mere existence

of a disparity is not in and of itself significant unless it does so by a significant amount. Such disparities may exist for several reasons including high police presence on high crime areas.

Therefore, we established a reasonable set of thresholds for determining if a department shows a significant enough disparity in its resident stops compared to its resident population to be identified. 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. 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.

A.5: METHODOLOGY FOR THE EQUALITY OF DISPOSITION TEST

We propose a simple test of equality in the distribution of outcomes for motorists of different races conditional on the reason that they were stopped. Specifically, we test whether traffic stops made of minority motorists result in different outcomes relative to their White Non-Hispanic peers. Since ex-ante it is unclear whether discrimination would create more or less severe traffic stop outcomes in the data, we simply tests for equality in the distribution of outcomes across demography conditional on the motivating reason for the stop. To illustrate this point, imagine a simplified case where there are only two outcomes for a traffic stop- one resulting in a violation and the other resulting in a warning. On the one hand, discriminatory police officers might treat minority motorists more harshly conditional on the reason they were stopped. However, discriminatory police might also make more pretextual traffic stops for lower level offenses motivated by the fact that they may observe evidence of a more severe crime once the vehicle is stopped. In this case, we would expect that discriminatory police officers issue more warnings to minority motorists as a result of pretextual traffic stops and racial profiling. Rather than making unreasonable assumptions about the net-effect of such countervailing forces, we simply assume that the overall distribution of outcomes will not be equal across race in the presence of discrimination. The intuition is similar to hit-rate style tests but where we are unable to ex-ante sign the direction that we expect bias to take.

Here, we aggregate all search and arrest data (driver, passenger, and vehicle) into a singular aggregate statistic for whether a traffic stop resulted in these outcomes. In cases where a traffic stop resulted in a combination of outcomes, say an arrest and a ticket or where one individual in the car was searcher but others were not, we aggregate to the more severe outcome i.e. arrest in the first case and search in the latter. Since we have combined data on driver and passenger outcomes, we also amend the race variable to represent whether there was any minority person in the vehicle at the time of the stop. For example, unlike in other sections where the Hispanic category represents the demography of the driver, here it represents whether any individual in the vehicle was observed to be Hispanic.

We also aggregate the detailed outcome data into six categories, which include: (1) no search, ticket or misdemeanor, (2) no search, warning or no action, (3) no search, arrest, (4) search, ticker or misdemeanor, (5) search, warning or no action, and (6) search, arrest. Thus, we estimate the full set of *J-1* outcomes relative to a baseline outcome using multinomial logit. We assume that the log odds $\eta_{j,i}$ that a traffic stop *i* has an outcome *j* relative to the omitted baseline category (no search, ticket or misdemeanor) follows a linear model of the form

$$\eta_{j,i} = \beta_{j,0} + \beta_{\mathrm{j},1}^{T} reason_i + \beta_{\mathrm{j},2} m_i + \beta_{\mathrm{j},3}^{T} [reason_i * m_i] \qquad (9)$$

where m_i is an indicator equal to one if anyone in the vehicle is a minority and zero if the vehicle contains only White Non-Hispanic motorists. The variable $reason_i$ is a vector of indicators constructed by aggregating the detailed reason for stop data into six categories which include: (1) speed or moving, (2) equipment, (3) seatbelt or cellphone, (4) registration or license, (5) warrant or criminal activity, and (6) all other. Although omitted from Equation 10 for parsimony, we also control for potential compositional

differences across demographic groups by including gender and age. Similarly, we include a series of controls for day of week, time of day, week of year, and depending on the specification either department or officer fixed-effects.

The key variable of interest in Equation 9 is the interaction term between minority status and the motivating reason for the traffic stop. As noted, we assume only that these coefficient estimates will be statistically different than zero in the presence of discrimination and do not put any emphasis on a particular sign. To identify discrimination in context of our empirical framework, we test whether the interaction between the reason a stop was made and minority status is statistically different from zero across all six of the outcomes modeled. Thus, we operationalize our test by performing a joint chi-squared hypothesis test on the 25 interaction terms across all non-omitted outcomes and possible reasons for the stop.

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. Imagining that minority motorists were more likely to be stopped based on police observing multiple violations, the data might show that they receive worse outcomes conditional on the primary motivating reason for the stop. However, this might be a function of the unobserved variable (i.e. number and type of secondary violation) rather than a disparity. Intuitively, it seems reasonable that motorists with multiple violations are treated differently by police relative to those with a single violation and that there might be differences across race in the probability of having multiple violations conditional on being stopped. 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.

A.6: METHODOLOGY FOR THE HIT-RATE TEST

The logic of the hit-rate test follows from a simplified game theoretic exposition. In the absence of disparate treatment, the costs of searching different groups of motorists are equal. Police officers make decisions to search in an effort to maximize their expectations of finding contraband. The implication being that police will be more likely to search a group that has a higher probability of carrying contraband, i.e. participate in statistical discrimination. In turn, motorists from the targeted demography understand this aspect of police behavior and respond by lowering their rate of carrying contraband. This iterative process continues within demographic groups until, in equilibrium, it is expected that an equalization of hit-rates across groups is found.

Knowles et al. introduce disparate treatment via search costs incurred by officers that differ across demographic groups. An officer with a lower search cost for a specific demographic group will be more likely to search motorists from that group. The result of this action will be an observable increase in the number of targeted searches for that group. As above, the targeted group will respond rationally and reduce their exposure by carrying less contraband. Eventually, the added benefit associated with a higher probability of finding contraband in the non-targeted group will offset the lower cost of search for that group. As a result, one would expect the hit-rates to differ across demographic groups in the presence of disparate treatment.

Knowles et al. (2001) developed a theoretical model with testable implications that can be used to evaluate statistical disparities in the rate of searches across demographic groups. Following Knowles et al. an empirical test of the null hypothesis (that no racial or ethnic disparity exists) in Equation 10 is presented.

$$P(H = 1 \mid m, S) = P(H = 1|S\,) \;\forall\, r, c \tag{10}$$

Equation 10 computes the probability of a search resulting in a hit across different demographic groups. If the null hypothesis was true and there was no racial or ethnic disparity across these groups, one would expect the hit-rates across minority and non-minority groups to reach equilibrium. As discussed previously, this expectation stems from a game-theoretic model where officers and motorists optimize their behaviors based on knowledge of the other party's actions. In more concrete terms, one would expect motorists to lower their propensity to carry contraband as searches increase while officers would raise their propensity to search vehicles that are more likely to have contraband. Essentially, the model allows for statistical discrimination but finds if there is bias-based discrimination.

An important cautionary note about hit-rate tests related to an implicit infra-marginality assumption. Specifically, several papers have explored generalizations and extensions of the framework and found that, in certain circumstances, empirical testing using hit-rate tests can suffer from the infra-marginality problem as well as differences in the direction of bias across officers (see Antonovics and Knight 2004; Anwar and Fang 2006; Dharmapala and Ross 2003). Knowles and his colleagues responded to these critiques with further refinements of their model that provide additional evidence of its validity (Persico and Todd 2004). Although the results from a hit-rate analysis help contextualize post-stop activity within departments, the results should only be considered as supplementary evidence.

APPENDIX B: CHARACTERISTICS OF TRAFFIC STOPS DATA TABLES

Table B.1: Rate of Traffic Stops per 1,000 Residents (Sorted Alphabetically)

Town Name	2010 16 and Over Census Pop.	2018 Traffic Stops	Stops per Resident	Stops per 1,000 Residents
State of Rhode Island	857,232	249,352	0.29	291
Barrington	12,367	3,573	0.29	289
Bristol	19,780	4,761	0.24	241
Burrillville	12,861	4,515	0.35	351
Central Falls	14,379	4,907	0.34	341
Charlestown	6,524	4,519	0.69	693
Coventry	28,302	7,087	0.25	250
Cranston	66,140	28,734	0.43	434
Cumberland	26,946	4,873	0.18	181
East Greenwich	10,202	961	0.09	94
East Providence	39,050	12,832	0.33	329
Foster	3,790	854	0.23	225
Glocester	7,963	2,342	0.29	294
Hopkinton	6,586	2,246	0.34	341
Jamestown	4,533	1,657	0.37	366
Johnston	23,975	5,261	0.22	219
Lincoln	16,995	1,802	0.11	106
Little Compton	2,925	1,303	0.45	445
Middletown	12,911	4,294	0.33	333
Narragansett	13,937	4,949	0.36	355
Newport	21,076	6,431	0.31	305
North Kingstown	21,033	4,271	0.20	203
North Providence	27,300	5,323	0.19	195
North Smithfield	9,857	3,253	0.33	330
Pawtucket	56,572	10,671	0.19	189
Portsmouth	13,947	6,849	0.49	491
Providence	141,451	13,146	0.09	93
Richmond	6,080	1,741	0.29	286
Scituate	8,415	2,126	0.25	253
Smithfield	18,325	4,983	0.27	272
South Kingstown	25,974	5,974	0.23	230
Tiverton	13,168	2,531	0.19	192
Warren	8,910	3,516	0.39	395
Warwick	68,889	14,807	0.21	215
West Greenwich	4,854	933	0.19	192
West Warwick	24,051	5,646	0.23	235
Westerly	18,571	4,871	0.26	262
Woonsocket	32,349	6,037	0.19	187

Table B.2: Basis for Stop (Sorted by % Other Traffic Violation)

Department Name	Total	Other Traffic Violation	APB	Call for Service	Equipment/ Inspection Violation	Motorist Assist	Registration Violation	Seatbelt	Special Detail	Speeding	Suspicious Person	Violation of ordinance	Warrant
East Greenwich	961	46.4%	0.0%	7.8%	8.7%	1.9%	0.9%	0.8%	0.0%	31.6%	1.2%	0.5%	0.0%
Newport	6,431	46.3%	0.1%	2.8%	31.0%	0.2%	2.4%	0.7%	0.2%	15.7%	0.3%	0.1%	0.1%
Pawtucket	10,671	45.5%	0.2%	8.4%	14.7%	0.6%	3.1%	5.5%	0.1%	17.2%	2.3%	1.8%	0.5%
Bristol	4,761	44.3%	0.1%	2.4%	15.5%	0.0%	6.6%	5.9%	0.1%	24.5%	0.2%	0.3%	0.0%
Cranston	28,734	39.8%	0.0%	1.5%	26.2%	0.7%	8.9%	2.1%	1.9%	17.2%	1.2%	0.2%	0.1%
Central Falls	4,907	38.6%	0.0%	1.8%	10.2%	0.1%	7.0%	12.2%	3.6%	24.0%	0.4%	1.9%	0.1%
Providence	13,146	37.4%	0.4%	5.6%	21.2%	1.5%	8.6%	1.5%	0.8%	11.4%	9.3%	2.3%	0.0%
Smithfield	4,983	36.5%	0.1%	11.4%	8.0%	0.6%	19.6%	3.0%	0.3%	19.3%	0.8%	0.1%	0.3%
North Providence	5,323	35.7%	0.0%	2.3%	27.4%	0.2%	4.9%	12.2%	0.0%	17.1%	0.1%	0.1%	0.1%
Warwick	14,807	34.7%	0.0%	6.7%	22.4%	0.8%	6.5%	5.6%	0.4%	21.3%	0.7%	0.7%	0.1%
Univ Of Rhode Island	1,963	33.2%	0.1%	1.0%	11.6%	0.4%	15.4%	9.1%	0.2%	26.3%	2.2%	0.2%	0.3%
Woonsocket	6,035	32.4%	0.7%	12.5%	18.6%	0.4%	9.6%	4.1%	0.0%	14.5%	4.4%	1.7%	1.0%
Tiverton	2,531	31.9%	0.1%	2.2%	29.0%	0.8%	4.0%	12.8%	0.0%	17.9%	0.8%	0.0%	0.4%
Johnston	5,261	31.6%	0.1%	8.5%	15.9%	0.2%	7.0%	6.0%	0.2%	28.8%	0.6%	1.1%	0.1%
RISP - HQ	2,284	31.6%	0.1%	4.8%	23.8%	1.9%	4.1%	4.2%	12.4%	16.3%	0.1%	0.6%	0.1%
West Warwick	5,646	31.3%	0.0%	4.0%	15.2%	0.2%	11.7%	3.0%	0.0%	33.7%	0.7%	0.1%	0.0%
DEM	243	30.5%	0.0%	2.1%	1.6%	0.4%	5.8%	5.3%	0.8%	44.4%	1.2%	7.8%	0.0%
Coventry	7,087	30.3%	0.0%	3.4%	27.7%	0.1%	5.2%	1.4%	0.0%	31.3%	0.4%	0.2%	0.1%
Middletown	4,294	29.6%	0.2%	1.5%	10.0%	0.0%	16.2%	6.0%	0.1%	35.6%	0.1%	0.5%	0.1%
Westerly	4,871	29.0%	0.5%	2.9%	15.8%	0.2%	5.9%	7.1%	0.6%	37.3%	0.4%	0.1%	0.2%
Cumberland	4,873	28.9%	0.1%	3.1%	18.2%	0.5%	3.7%	7.1%	0.3%	37.3%	0.4%	0.1%	0.3%
Narragansett	4,949	28.4%	0.2%	2.1%	13.7%	0.4%	3.9%	2.1%	0.1%	48.2%	0.6%	0.2%	0.1%
Lincoln	1,802	28.3%	0.0%	9.9%	6.0%	0.2%	2.3%	4.3%	0.1%	47.6%	1.1%	0.2%	0.1%
Warren	3,516	27.4%	0.2%	4.0%	9.2%	0.1%	23.0%	6.4%	1.3%	27.8%	0.3%	0.3%	0.0%
South Kingstown	5,974	26.2%	0.5%	3.5%	7.6%	1.3%	8.0%	2.8%	0.0%	48.9%	0.7%	0.3%	0.2%
North Smithfield	3,253	25.9%	0.1%	1.5%	54.4%	0.3%	4.4%	2.2%	0.0%	9.3%	1.0%	0.8%	0.2%
East Providence	12,832	24.9%	0.2%	2.2%	37.9%	0.3%	11.4%	4.7%	0.0%	16.0%	1.7%	0.6%	0.2%
North Kingstown	4,269	23.9%	0.6%	4.5%	11.5%	2.8%	3.0%	0.0%	0.0%	52.4%	1.0%	0.0%	0.1%
RISP - Wickford	10,953	22.6%	0.2%	5.7%	16.3%	0.8%	8.7%	8.6%	0.4%	36.6%	0.0%	0.1%	0.1%
RISP - Hope Valley	8,618	22.2%	0.3%	3.5%	16.0%	0.7%	13.4%	5.5%	0.5%	37.5%	0.1%	0.1%	0.1%
Barrington	3,573	21.4%	0.1%	0.8%	13.4%	0.1%	13.3%	5.4%	0.0%	45.0%	0.2%	0.3%	0.0%
Portsmouth	6,849	20.0%	0.1%	1.1%	27.3%	0.8%	0.2%	4.0%	0.0%	46.2%	0.1%	0.1%	0.0%
RISP - Lincoln	12,558	19.9%	0.1%	9.6%	17.0%	0.8%	9.2%	16.8%	0.5%	25.7%	0.0%	0.1%	0.1%
Scituate	2,126	19.6%	0.0%	1.4%	7.1%	0.0%	2.3%	0.8%	0.0%	68.4%	0.3%	0.0%	0.0%
Charlestown	4,519	19.1%	0.4%	1.4%	9.1%	0.1%	9.6%	0.7%	0.0%	59.0%	0.4%	0.0%	0.1%
Jamestown	1,657	19.1%	0.5%	1.4%	11.5%	0.7%	1.1%	4.0%	0.0%	61.0%	0.5%	0.1%	0.1%
Richmond	1,741	18.1%	0.2%	1.1%	5.8%	0.3%	16.1%	0.4%	0.3%	56.3%	1.1%	0.1%	0.1%
RISP - Scituate	6,751	16.2%	0.0%	5.1%	16.1%	0.8%	17.4%	12.2%	0.4%	31.4%	0.1%	0.3%	0.0%

Table B.2: Basis for Stop (Sorted by % Other Traffic Violation)

Department Name	Total	Other Traffic Violation	APB	Call for Service	Equipment/ Inspection Violation	Motorist Assist	Registration Violation	Seatbelt	Special Detail	Speeding	Suspicious Person	Violation of ordinance	Warrant
Little Compton	1,303	15.5%	0.1%	0.6%	24.3%	0.2%	6.5%	7.3%	0.0%	45.3%	0.2%	0.0%	0.0%
RISP - Portsmouth	1,402	15.4%	0.1%	1.1%	17.5%	0.4%	5.3%	12.2%	1.1%	46.8%	0.0%	0.0%	0.1%
West Greenwich	933	14.0%	0.1%	1.0%	21.9%	0.3%	9.6%	0.8%	0.2%	50.2%	1.7%	0.1%	0.1%
Hopkinton	2,246	11.9%	0.1%	2.0%	17.3%	0.9%	3.2%	4.8%	0.0%	58.9%	0.7%	0.0%	0.0%
Glocester	2,342	11.7%	0.1%	1.8%	3.7%	0.0%	0.1%	3.2%	0.0%	79.2%	0.0%	0.1%	0.0%
Burrillville	4,515	11.3%	0.0%	1.8%	23.7%	0.1%	3.9%	1.6%	0.1%	56.7%	0.6%	0.0%	0.0%
Foster	854	8.9%	0.0%	3.5%	4.1%	1.4%	0.2%	0.6%	0.0%	81.1%	0.1%	0.0%	0.0%

Table B.3: Basis for Stop (Sorted by % Speeding)

Department Name	Total	Speeding	APB	Call for Service	Equipment/ Inspection Violation	Motorist Assist	Other Traffic Violation	Registration Violation	Seatbelt	Special Detail	Suspicious Person	Violation of ordinance	Warrant
Foster	854	81.1%	0.0%	3.5%	4.1%	1.4%	8.9%	0.2%	0.6%	0.0%	0.1%	0.0%	0.0%
Glocester	2,342	79.2%	0.1%	1.8%	3.7%	0.0%	11.7%	0.1%	3.2%	0.0%	0.0%	0.1%	0.0%
Scituate	2,126	68.4%	0.0%	1.4%	7.1%	0.0%	19.6%	2.3%	0.8%	0.0%	0.3%	0.0%	0.0%
Jamestown	1,657	61.0%	0.5%	1.4%	11.5%	0.7%	19.1%	1.1%	4.0%	0.0%	0.5%	0.1%	0.1%
Charlestown	4,519	59.0%	0.4%	1.4%	9.1%	0.1%	19.1%	9.6%	0.7%	0.0%	0.4%	0.0%	0.1%
Hopkinton	2,246	58.9%	0.1%	2.0%	17.3%	0.9%	11.9%	3.2%	4.8%	0.0%	0.7%	0.0%	0.0%
Burrillville	4,515	56.7%	0.0%	1.8%	23.7%	0.1%	11.3%	3.9%	1.6%	0.1%	0.6%	0.0%	0.0%
Richmond	1,741	56.3%	0.2%	1.1%	5.8%	0.3%	18.1%	16.1%	0.4%	0.3%	1.1%	0.1%	0.1%
North Kingstown	4,269	52.4%	0.6%	4.5%	11.5%	2.8%	23.9%	3.0%	0.0%	0.0%	1.0%	0.0%	0.1%
West Greenwich	933	50.2%	0.1%	1.0%	21.9%	0.3%	14.0%	9.6%	0.8%	0.2%	1.7%	0.1%	0.1%
South Kingstown	5,974	48.9%	0.5%	3.5%	7.6%	1.3%	26.2%	8.0%	2.8%	0.0%	0.7%	0.3%	0.2%
Narragansett	4,949	48.2%	0.2%	2.1%	13.7%	0.4%	28.4%	3.9%	2.1%	0.1%	0.6%	0.2%	0.1%
Lincoln	1,802	47.6%	0.0%	9.9%	6.0%	0.2%	28.3%	2.3%	4.3%	0.1%	1.1%	0.2%	0.1%
RISP - Portsmouth	1,402	46.8%	0.1%	1.1%	17.5%	0.4%	15.4%	5.3%	12.2%	1.1%	0.0%	0.0%	0.1%
Portsmouth	6,849	46.2%	0.1%	1.1%	27.3%	0.8%	20.0%	0.2%	4.0%	0.0%	0.1%	0.1%	0.0%
Little Compton	1,303	45.3%	0.1%	0.6%	24.3%	0.2%	15.5%	6.5%	7.3%	0.0%	0.2%	0.0%	0.0%
Barrington	3,573	45.0%	0.1%	0.8%	13.4%	0.1%	21.4%	13.3%	5.4%	0.0%	0.2%	0.3%	0.0%
DEM	243	44.4%	0.0%	2.1%	1.6%	0.4%	30.5%	5.8%	5.3%	0.8%	1.2%	7.8%	0.0%
RISP - Hope Valley	8,618	37.5%	0.3%	3.5%	16.0%	0.7%	22.2%	13.4%	5.5%	0.5%	0.1%	0.1%	0.1%
Westerly	4,871	37.3%	0.5%	2.9%	15.8%	0.2%	29.0%	5.9%	7.1%	0.6%	0.4%	0.1%	0.2%
Cumberland	4,873	37.3%	0.1%	3.1%	18.2%	0.5%	28.9%	3.7%	7.1%	0.3%	0.4%	0.1%	0.3%
RISP - Wickford	10,953	36.6%	0.2%	5.7%	16.3%	0.8%	22.6%	8.7%	8.6%	0.4%	0.0%	0.1%	0.1%
Middletown	4,294	35.6%	0.2%	1.5%	10.0%	0.0%	29.6%	16.2%	6.0%	0.1%	0.1%	0.5%	0.1%
West Warwick	5,646	33.7%	0.0%	4.0%	15.2%	0.2%	31.3%	11.7%	3.0%	0.0%	0.7%	0.1%	0.0%
East Greenwich	961	31.6%	0.0%	7.8%	8.7%	1.9%	46.4%	0.9%	0.8%	0.0%	1.2%	0.5%	0.0%
RISP - Scituate	6,751	31.4%	0.0%	5.1%	16.1%	0.8%	16.2%	17.4%	12.2%	0.4%	0.1%	0.3%	0.0%
Coventry	7,087	31.3%	0.0%	3.4%	27.7%	0.1%	30.3%	5.2%	1.4%	0.0%	0.4%	0.2%	0.1%
Johnston	5,261	28.8%	0.1%	8.5%	15.9%	0.2%	31.6%	7.0%	6.0%	0.2%	0.6%	1.1%	0.1%
Warren	3,516	27.8%	0.2%	4.0%	9.2%	0.1%	27.4%	23.0%	6.4%	1.3%	0.3%	0.3%	0.0%
Univ Of Rhode Island	1,963	26.3%	0.1%	1.0%	11.6%	0.4%	33.2%	15.4%	9.1%	0.2%	2.2%	0.2%	0.3%
RISP - Lincoln	12,558	25.7%	0.1%	9.6%	17.0%	0.8%	19.9%	9.2%	16.8%	0.5%	0.0%	0.1%	0.1%
Bristol	4,761	24.5%	0.1%	2.4%	15.5%	0.0%	44.3%	6.6%	5.9%	0.1%	0.2%	0.3%	0.0%
Central Falls	4,907	24.0%	0.0%	1.8%	10.2%	0.1%	38.6%	7.0%	12.2%	3.6%	0.4%	1.9%	0.1%
Warwick	14,807	21.3%	0.0%	6.7%	22.4%	0.8%	34.7%	6.5%	5.6%	0.4%	0.7%	0.7%	0.1%
Smithfield	4,983	19.3%	0.1%	11.4%	8.0%	0.6%	36.5%	19.6%	3.0%	0.3%	0.8%	0.1%	0.3%
Tiverton	2,531	17.9%	0.1%	2.2%	29.0%	0.8%	31.9%	4.0%	12.8%	0.0%	0.8%	0.0%	0.4%
Cranston	28,734	17.2%	0.0%	1.5%	26.2%	0.7%	39.8%	8.9%	2.1%	1.9%	1.2%	0.2%	0.1%
Pawtucket	10,671	17.2%	0.2%	8.4%	14.7%	0.6%	45.5%	3.1%	5.5%	0.1%	2.3%	1.8%	0.5%

Table B.3: Basis for Stop (Sorted by % Speeding)

Department Name	Total	Speeding	APB	Call for Service	Equipment/ Inspection Violation	Motorist Assist	Other Traffic Violation	Registration Violation	Seatbelt	Special Detail	Suspicious Person	Violation of ordinance	Warrant
North Providence	5,323	17.1%	0.0%	2.3%	27.4%	0.2%	35.7%	4.9%	12.2%	0.0%	0.1%	0.1%	0.1%
RISP - HQ	2,284	16.3%	0.1%	4.8%	23.8%	1.9%	31.6%	4.1%	4.2%	12.4%	0.1%	0.6%	0.1%
East Providence	12,832	16.0%	0.2%	2.2%	37.9%	0.3%	24.9%	11.4%	4.7%	0.0%	1.7%	0.6%	0.2%
Newport	6,431	15.7%	0.1%	2.8%	31.0%	0.2%	46.3%	2.4%	0.7%	0.2%	0.3%	0.1%	0.1%
Woonsocket	6,035	14.5%	0.7%	12.5%	18.6%	0.4%	32.4%	9.6%	4.1%	0.0%	4.4%	1.7%	1.0%
Providence	13,146	11.4%	0.4%	5.6%	21.2%	1.5%	37.4%	8.6%	1.5%	0.8%	9.3%	2.3%	0.0%
North Smithfield	3,253	9.3%	0.1%	1.5%	54.4%	0.3%	25.9%	4.4%	2.2%	0.0%	1.0%	0.8%	0.2%

Table B.4: Basis for Stop (Sorted by % Equipment/Inspection Violation)

Department Name	Total	Equipment/ Inspection Violation	APB	Call for Service	Motorist Assist	Other Traffic Violation	Registration Violation	Seatbelt	Special Detail	Speeding	Suspicious Person	Violation of ordinance	Warrant
North Smithfield	3,253	54.4%	0.1%	1.5%	0.3%	25.9%	4.4%	2.2%	0.0%	9.3%	1.0%	0.8%	0.2%
East Providence	12,832	37.9%	0.2%	2.2%	0.3%	24.9%	11.4%	4.7%	0.0%	16.0%	1.7%	0.6%	0.2%
Newport	6,431	31.0%	0.1%	2.8%	0.2%	46.3%	2.4%	0.7%	0.2%	15.7%	0.3%	0.1%	0.1%
Tiverton	2,531	29.0%	0.1%	2.2%	0.8%	31.9%	4.0%	12.8%	0.0%	17.9%	0.8%	0.0%	0.4%
Coventry	7,087	27.7%	0.0%	3.4%	0.1%	30.3%	5.2%	1.4%	0.0%	31.3%	0.4%	0.2%	0.1%
North Providence	5,323	27.4%	0.0%	2.3%	0.2%	35.7%	4.9%	12.2%	0.0%	17.1%	0.1%	0.1%	0.1%
Portsmouth	6,849	27.3%	0.1%	1.1%	0.8%	20.0%	0.2%	4.0%	0.0%	46.2%	0.1%	0.1%	0.0%
Cranston	28,734	26.2%	0.0%	1.5%	0.7%	39.8%	8.9%	2.1%	1.9%	17.2%	1.2%	0.2%	0.1%
Little Compton	1,303	24.3%	0.1%	0.6%	0.2%	15.5%	6.5%	7.3%	0.0%	45.3%	0.2%	0.0%	0.0%
RISP - HQ	2,284	23.8%	0.1%	4.8%	1.9%	31.6%	4.1%	4.2%	12.4%	16.3%	0.1%	0.6%	0.1%
Burrillville	4,515	23.7%	0.0%	1.8%	0.1%	11.3%	3.9%	1.6%	0.1%	56.7%	0.6%	0.0%	0.0%
Warwick	14,807	22.4%	0.0%	6.7%	0.8%	34.7%	6.5%	5.6%	0.4%	21.3%	0.7%	0.7%	0.1%
West Greenwich	933	21.9%	0.1%	1.0%	0.3%	14.0%	9.6%	0.8%	0.2%	50.2%	1.7%	0.1%	0.1%
Providence	13,146	21.2%	0.4%	5.6%	1.5%	37.4%	8.6%	1.5%	0.8%	11.4%	9.3%	2.3%	0.0%
Woonsocket	6,035	18.6%	0.7%	12.5%	0.4%	32.4%	9.6%	4.1%	0.0%	14.5%	4.4%	1.7%	1.0%
Cumberland	4,873	18.2%	0.1%	3.1%	0.5%	28.9%	3.7%	7.1%	0.3%	37.3%	0.4%	0.1%	0.3%
RISP - Portsmouth	1,402	17.5%	0.1%	1.1%	0.4%	15.4%	5.3%	12.2%	1.1%	46.8%	0.0%	0.0%	0.1%
Hopkinton	2,246	17.3%	0.1%	2.0%	0.9%	11.9%	3.2%	4.8%	0.0%	58.9%	0.7%	0.0%	0.0%
RISP - Lincoln	12,558	17.0%	0.1%	9.6%	0.8%	19.9%	9.2%	16.8%	0.5%	25.7%	0.0%	0.1%	0.1%
RISP - Wickford	10,953	16.3%	0.2%	5.7%	0.8%	22.6%	8.7%	8.6%	0.4%	36.6%	0.0%	0.1%	0.1%
RISP - Scituate	6,751	16.1%	0.0%	5.1%	0.8%	16.2%	17.4%	12.2%	0.4%	31.4%	0.1%	0.3%	0.0%
RISP - Hope Valley	8,618	16.0%	0.3%	3.5%	0.7%	22.2%	13.4%	5.5%	0.5%	37.5%	0.1%	0.1%	0.1%
Johnston	5,261	15.9%	0.1%	8.5%	0.2%	31.6%	7.0%	6.0%	0.2%	28.8%	0.6%	1.1%	0.1%
Westerly	4,871	15.8%	0.5%	2.9%	0.2%	29.0%	5.9%	7.1%	0.6%	37.3%	0.4%	0.1%	0.2%
Bristol	4,761	15.5%	0.1%	2.4%	0.0%	44.3%	6.6%	5.9%	0.1%	24.5%	0.2%	0.3%	0.0%
West Warwick	5,646	15.2%	0.0%	4.0%	0.2%	31.3%	11.7%	3.0%	0.0%	33.7%	0.7%	0.1%	0.0%
Pawtucket	10,671	14.7%	0.2%	8.4%	0.6%	45.5%	3.1%	5.5%	0.1%	17.2%	2.3%	1.8%	0.5%
Narragansett	4,949	13.7%	0.2%	2.1%	0.4%	28.4%	3.9%	2.1%	0.1%	48.2%	0.6%	0.2%	0.1%
Barrington	3,573	13.4%	0.1%	0.8%	0.1%	21.4%	13.3%	5.4%	0.0%	45.0%	0.2%	0.3%	0.0%
Univ Of Rhode Island	1,963	11.6%	0.1%	1.0%	0.4%	33.2%	15.4%	9.1%	0.2%	26.3%	2.2%	0.2%	0.3%
North Kingstown	4,269	11.5%	0.6%	4.5%	2.8%	23.9%	3.0%	0.0%	0.0%	52.4%	1.0%	0.0%	0.1%
Jamestown	1,657	11.5%	0.5%	1.4%	0.7%	19.1%	1.1%	4.0%	0.0%	61.0%	0.5%	0.1%	0.1%
Central Falls	4,907	10.2%	0.0%	1.8%	0.1%	38.6%	7.0%	12.2%	3.6%	24.0%	0.4%	1.9%	0.1%
Middletown	4,294	10.0%	0.2%	1.5%	0.0%	29.6%	16.2%	6.0%	0.1%	35.6%	0.1%	0.5%	0.1%
Warren	3,516	9.2%	0.2%	4.0%	0.1%	27.4%	23.0%	6.4%	1.3%	27.8%	0.3%	0.3%	0.0%
Charlestown	4,519	9.1%	0.4%	1.4%	0.1%	19.1%	9.6%	0.7%	0.0%	59.0%	0.4%	0.0%	0.1%
East Greenwich	961	8.7%	0.0%	7.8%	1.9%	46.4%	0.9%	0.8%	0.0%	31.6%	1.2%	0.5%	0.0%
Smithfield	4,983	8.0%	0.1%	11.4%	0.6%	36.5%	19.6%	3.0%	0.3%	19.3%	0.8%	0.1%	0.3%

Table B.4: Basis for Stop (Sorted by % Equipment/Inspection Violation)

Department Name	Total	Equipment/ Inspection Violation	APB	Call for Service	Motorist Assist	Other Traffic Violation	Registration Violation	Seatbelt	Special Detail	Speeding	Suspicious Person	Violation of ordinance	Warrant
South Kingstown	5,974	7.6%	0.5%	3.5%	1.3%	26.2%	8.0%	2.8%	0.0%	48.9%	0.7%	0.3%	0.2%
Scituate	2,126	7.1%	0.0%	1.4%	0.0%	19.6%	2.3%	0.8%	0.0%	68.4%	0.3%	0.0%	0.0%
Lincoln	1,802	6.0%	0.0%	9.9%	0.2%	28.3%	2.3%	4.3%	0.1%	47.6%	1.1%	0.2%	0.1%
Richmond	1,741	5.8%	0.2%	1.1%	0.3%	18.1%	16.1%	0.4%	0.3%	56.3%	1.1%	0.1%	0.1%
Foster	854	4.1%	0.0%	3.5%	1.4%	8.9%	0.2%	0.6%	0.0%	81.1%	0.1%	0.0%	0.0%
Glocester	2,342	3.7%	0.1%	1.8%	0.0%	11.7%	0.1%	3.2%	0.0%	79.2%	0.0%	0.1%	0.0%
DEM	243	1.6%	0.0%	2.1%	0.4%	30.5%	5.8%	5.3%	0.8%	44.4%	1.2%	7.8%	0.0%

Table B.5: Outcome of Stop (Sorted by % Citation)

Department Name	N	Citation	Warning	Notice and Demand	Arrest Driver	Arrest Passenger	No Action
Johnston	5,261	74.9%	20.4%	0.0%	1.6%	0.2%	2.9%
Scituate	2,126	72.3%	24.3%	0.1%	2.5%	0.0%	0.7%
North Providence	5,323	70.5%	27.5%	0.1%	1.5%	0.1%	0.3%
Pawtucket	10,671	62.4%	28.4%	0.5%	2.5%	0.2%	6.0%
Central Falls	4,907	60.7%	33.5%	0.0%	4.7%	0.1%	0.9%
Smithfield	4,983	58.6%	29.0%	1.1%	1.7%	0.1%	9.6%
RISP - Portsmouth	1,402	58.2%	38.7%	0.1%	0.3%	0.0%	2.7%
RISP - Hope Valley	8,618	56.3%	38.6%	0.3%	1.5%	0.1%	3.3%
Glocester	2,342	55.8%	43.6%	0.0%	0.5%	0.0%	0.1%
Warren	3,516	54.5%	34.4%	2.2%	2.9%	0.1%	5.9%
RISP - Lincoln	12,558	54.5%	35.0%	1.0%	3.3%	0.8%	5.5%
Richmond	1,741	50.1%	48.5%	0.1%	1.2%	0.0%	0.1%
RISP - Scituate	6,751	49.1%	44.4%	0.3%	1.7%	0.2%	4.2%
RISP - Wickford	10,953	46.6%	45.2%	0.5%	2.4%	0.3%	5.0%
East Greenwich	961	45.0%	46.3%	0.6%	2.5%	0.1%	5.5%
RISP - HQ	2,284	44.1%	16.0%	9.3%	5.2%	0.2%	25.2%
Cumberland	4,873	43.9%	46.6%	1.8%	5.1%	0.5%	2.1%
Lincoln	1,802	42.8%	52.4%	0.0%	2.1%	0.2%	2.5%
Hopkinton	2,246	42.1%	47.6%	5.2%	1.9%	0.0%	3.2%
Middletown	4,294	40.3%	58.6%	0.0%	0.5%	0.0%	0.5%
East Providence	12,832	37.8%	53.6%	3.7%	2.3%	0.3%	2.2%
North Kingstown	4,269	36.1%	53.2%	1.7%	3.2%	0.2%	5.6%
Woonsocket	6,035	35.6%	50.2%	1.7%	5.9%	0.7%	5.9%
Warwick	14,807	34.6%	56.0%	0.8%	4.6%	0.2%	3.8%
West Warwick	5,646	34.4%	55.0%	0.3%	6.6%	0.0%	3.6%
Westerly	4,871	34.1%	63.4%	0.1%	1.3%	0.2%	0.8%
Foster	854	32.3%	65.2%	0.0%	0.9%	0.1%	1.4%
Bristol	4,761	30.1%	69.1%	0.6%	0.2%	0.0%	0.0%
Univ Of Rhode Island	1,963	30.1%	62.6%	1.0%	1.8%	0.0%	4.6%
DEM	243	29.6%	60.9%	0.0%	2.9%	0.0%	6.6%
Narragansett	4,949	29.5%	62.9%	0.3%	4.4%	0.2%	2.8%
South Kingstown	5,974	28.9%	62.3%	1.1%	3.5%	0.1%	4.0%
Tiverton	2,531	28.2%	64.2%	1.4%	2.5%	0.1%	3.6%
Barrington	3,573	27.6%	69.6%	0.1%	1.9%	0.1%	0.6%
Burrillville	4,515	26.7%	70.5%	0.2%	2.2%	0.0%	0.3%
Coventry	7,087	26.3%	72.0%	0.3%	1.0%	0.0%	0.4%
West Greenwich	933	24.9%	68.2%	2.9%	1.1%	0.0%	3.0%
Providence	13,146	24.3%	58.0%	0.5%	6.4%	0.9%	10.0%
Cranston	28,734	24.2%	65.9%	0.9%	1.7%	0.2%	7.0%
Jamestown	1,657	22.7%	72.3%	0.2%	2.6%	0.1%	2.2%
Portsmouth	6,849	19.2%	75.8%	1.4%	2.1%	0.1%	1.4%
North Smithfield	3,253	18.8%	64.7%	4.2%	8.8%	0.9%	2.6%
Charlestown	4,519	18.5%	74.4%	1.4%	3.2%	0.1%	2.5%
Little Compton	1,303	13.4%	84.6%	0.1%	1.6%	0.1%	0.3%
Newport	6,431	6.7%	92.4%	0.0%	0.5%	0.0%	0.3%

Table B.6: Outcome of Stop (Sorted by % Warning)

Department Name	N	Warning	Citation	Notice and Demand	Arrest Driver	Arrest Passenger	No Action
Newport	6,431	92.4%	6.7%	0.0%	0.5%	0.0%	0.3%
Little Compton	1,303	84.6%	13.4%	0.1%	1.6%	0.1%	0.3%
Portsmouth	6,849	75.8%	19.2%	1.4%	2.1%	0.1%	1.4%
Charlestown	4,519	74.4%	18.5%	1.4%	3.2%	0.1%	2.5%
Jamestown	1,657	72.3%	22.7%	0.2%	2.6%	0.1%	2.2%
Coventry	7,087	72.0%	26.3%	0.3%	1.0%	0.0%	0.4%
Burrillville	4,515	70.5%	26.7%	0.2%	2.2%	0.0%	0.3%
Barrington	3,573	69.6%	27.6%	0.1%	1.9%	0.1%	0.6%
Bristol	4,761	69.1%	30.1%	0.6%	0.2%	0.0%	0.0%
West Greenwich	933	68.2%	24.9%	2.9%	1.1%	0.0%	3.0%
Cranston	28,734	65.9%	24.2%	0.9%	1.7%	0.2%	7.0%
Foster	854	65.2%	32.3%	0.0%	0.9%	0.1%	1.4%
North Smithfield	3,253	64.7%	18.8%	4.2%	8.8%	0.9%	2.6%
Tiverton	2,531	64.2%	28.2%	1.4%	2.5%	0.1%	3.6%
Westerly	4,871	63.4%	34.1%	0.1%	1.3%	0.2%	0.8%
Narragansett	4,949	62.9%	29.5%	0.3%	4.4%	0.2%	2.8%
Univ Of Rhode Island	1,963	62.6%	30.1%	1.0%	1.8%	0.0%	4.6%
South Kingstown	5,974	62.3%	28.9%	1.1%	3.5%	0.1%	4.0%
DEM	243	60.9%	29.6%	0.0%	2.9%	0.0%	6.6%
Middletown	4,294	58.6%	40.3%	0.0%	0.5%	0.0%	0.5%
Providence	13,146	58.0%	24.3%	0.5%	6.4%	0.9%	10.0%
Warwick	14,807	56.0%	34.6%	0.8%	4.6%	0.2%	3.8%
West Warwick	5,646	55.0%	34.4%	0.3%	6.6%	0.0%	3.6%
East Providence	12,832	53.6%	37.8%	3.7%	2.3%	0.3%	2.2%
North Kingstown	4,269	53.2%	36.1%	1.7%	3.2%	0.2%	5.6%
Lincoln	1,802	52.4%	42.8%	0.0%	2.1%	0.2%	2.5%
Woonsocket	6,035	50.2%	35.6%	1.7%	5.9%	0.7%	5.9%
Richmond	1,741	48.5%	50.1%	0.1%	1.2%	0.0%	0.1%
Hopkinton	2,246	47.6%	42.1%	5.2%	1.9%	0.0%	3.2%
Cumberland	4,873	46.6%	43.9%	1.8%	5.1%	0.5%	2.1%
East Greenwich	961	46.3%	45.0%	0.6%	2.5%	0.1%	5.5%
RISP - Wickford	10,953	45.2%	46.6%	0.5%	2.4%	0.3%	5.0%
RISP - Scituate	6,751	44.4%	49.1%	0.3%	1.7%	0.2%	4.2%
Glocester	2,342	43.6%	55.8%	0.0%	0.5%	0.0%	0.1%
RISP - Portsmouth	1,402	38.7%	58.2%	0.1%	0.3%	0.0%	2.7%
RISP - Hope Valley	8,618	38.6%	56.3%	0.3%	1.5%	0.1%	3.3%
RISP - Lincoln	12,558	35.0%	54.5%	1.0%	3.3%	0.8%	5.5%
Warren	3,516	34.4%	54.5%	2.2%	2.9%	0.1%	5.9%
Central Falls	4,907	33.5%	60.7%	0.0%	4.7%	0.1%	0.9%
Smithfield	4,983	29.0%	58.6%	1.1%	1.7%	0.1%	9.6%
Pawtucket	10,671	28.4%	62.4%	0.5%	2.5%	0.2%	6.0%
North Providence	5,323	27.5%	70.5%	0.1%	1.5%	0.1%	0.3%
Scituate	2,126	24.3%	72.3%	0.1%	2.5%	0.0%	0.7%
Johnston	5,261	20.4%	74.9%	0.0%	1.6%	0.2%	2.9%
RISP - HQ	2,284	16.0%	44.1%	9.3%	5.2%	0.2%	25.2%

Table B.7: Outcome of Stop (Sorted by % Arrest)

Department Name	N	Arrest	Warning	Citation	Notice and Demand	No Action
North Smithfield	3,253	9.7%	64.7%	18.8%	4.2%	2.6%
Providence	13,146	7.2%	58.0%	24.3%	0.5%	10.0%
West Warwick	5,646	6.7%	55.0%	34.4%	0.3%	3.6%
Woonsocket	6,035	6.6%	50.2%	35.6%	1.7%	5.9%
Cumberland	4,873	5.6%	46.6%	43.9%	1.8%	2.1%
RISP - HQ	2,284	5.4%	16.0%	44.1%	9.3%	25.2%
Central Falls	4,907	4.9%	33.5%	60.7%	0.0%	0.9%
Warwick	14,807	4.8%	56.0%	34.6%	0.8%	3.8%
Narragansett	4,949	4.6%	62.9%	29.5%	0.3%	2.8%
RISP - Lincoln	12,558	4.1%	35.0%	54.5%	1.0%	5.5%
South Kingstown	5,974	3.6%	62.3%	28.9%	1.1%	4.0%
North Kingstown	4,269	3.3%	53.2%	36.1%	1.7%	5.6%
Charlestown	4,519	3.3%	74.4%	18.5%	1.4%	2.5%
Warren	3,516	2.9%	34.4%	54.5%	2.2%	5.9%
DEM	243	2.9%	60.9%	29.6%	0.0%	6.6%
Pawtucket	10,671	2.8%	28.4%	62.4%	0.5%	6.0%
RISP - Wickford	10,953	2.7%	45.2%	46.6%	0.5%	5.0%
Jamestown	1,657	2.7%	72.3%	22.7%	0.2%	2.2%
East Providence	12,832	2.6%	53.6%	37.8%	3.7%	2.2%
Tiverton	2,531	2.6%	64.2%	28.2%	1.4%	3.6%
East Greenwich	961	2.6%	46.3%	45.0%	0.6%	5.5%
Scituate	2,126	2.6%	24.3%	72.3%	0.1%	0.7%
Lincoln	1,802	2.3%	52.4%	42.8%	0.0%	2.5%
Burrillville	4,515	2.3%	70.5%	26.7%	0.2%	0.3%
Portsmouth	6,849	2.1%	75.8%	19.2%	1.4%	1.4%
Barrington	3,573	2.0%	69.6%	27.6%	0.1%	0.6%
Cranston	28,734	2.0%	65.9%	24.2%	0.9%	7.0%
RISP - Scituate	6,751	1.9%	44.4%	49.1%	0.3%	4.2%
Hopkinton	2,246	1.9%	47.6%	42.1%	5.2%	3.2%
Univ Of Rhode Island	1,963	1.8%	62.6%	30.1%	1.0%	4.6%
Johnston	5,261	1.8%	20.4%	74.9%	0.0%	2.9%
Smithfield	4,983	1.7%	29.0%	58.6%	1.1%	9.6%
Little Compton	1,303	1.7%	84.6%	13.4%	0.1%	0.3%
North Providence	5,323	1.6%	27.5%	70.5%	0.1%	0.3%
Westerly	4,871	1.5%	63.4%	34.1%	0.1%	0.8%
RISP - Hope Valley	8,618	1.5%	38.6%	56.3%	0.3%	3.3%
Richmond	1,741	1.2%	48.5%	50.1%	0.1%	0.1%
West Greenwich	933	1.1%	68.2%	24.9%	2.9%	3.0%
Foster	854	1.1%	65.2%	32.3%	0.0%	1.4%
Coventry	7,087	1.0%	72.0%	26.3%	0.3%	0.4%
Middletown	4,294	0.6%	58.6%	40.3%	0.0%	0.5%
Newport	6,431	0.6%	92.4%	6.7%	0.0%	0.3%
Glocester	2,342	0.5%	43.6%	55.8%	0.0%	0.1%
RISP - Portsmouth	1,402	0.3%	38.7%	58.2%	0.1%	2.7%
Bristol	4,761	0.2%	69.1%	30.1%	0.6%	0.0%

Table B.8: Number of Searches (Sorted Alphabetically)

Department Name	Stops	Searches		Contraband	
		N	%	N	%
Barrington	3,573	6	0.2%	5	83.3%
Bristol	4,761	22	0.5%	10	45.5%
Burrillville	4,515	95	2.1%	49	51.6%
Central Falls	4,907	83	1.7%	33	39.8%
Charlestown	4,519	74	1.6%	23	31.1%
Coventry	7,087	198	2.8%	78	39.4%
Cranston	28,734	448	1.6%	214	47.8%
Cumberland	4,873	126	2.6%	29	23.0%
DEM	243	7	2.9%	4	57.1%
East Greenwich	961	5	0.5%	0	0.0%
East Providence	12,832	799	6.2%	348	43.6%
Foster	854	9	1.1%	4	44.4%
Glocester	2,342	28	1.2%	15	53.6%
Hopkinton	2,246	79	3.5%	36	45.6%
Jamestown	1,657	65	3.9%	38	58.5%
Johnston	5,261	156	3.0%	24	15.4%
Lincoln	1,802	17	0.9%	4	23.5%
Little Compton	1,303	59	4.5%	51	86.4%
Middletown	4,294	125	2.9%	45	36.0%
Narragansett	4,949	99	2.0%	42	42.4%
Newport	6,431	178	2.8%	69	38.8%
North Kingstown	4,269	120	2.8%	36	30.0%
North Providence	5,323	103	1.9%	28	27.2%
North Smithfield	3,253	237	7.3%	24	10.1%
Pawtucket	10,671	483	4.5%	174	36.0%
Portsmouth	6,849	26	0.4%	5	19.2%
Providence*	13,146	3,706	28.2%	1581	42.7%
Richmond	1,741	55	3.2%	40	72.7%
RISP - Hope Valley	8,618	204	2.4%	92	45.1%
RISP - HQ	2,284	21	0.9%	15	71.4%
RISP - Lincoln	12,558	135	1.1%	63	46.7%
RISP - Portsmouth	1,402	4	0.3%	2	50.0%
RISP - Scituate	6,751	78	1.2%	18	23.1%
RISP - Wickford	10,953	74	0.7%	30	40.5%
Scituate	2,126	26	1.2%	12	46.2%
Smithfield	4,983	39	0.8%	24	61.5%
South Kingstown	5,974	98	1.6%	58	59.2%
Tiverton	2,531	135	5.3%	82	60.7%
Univ Of Rhode Island	1,963	56	2.9%	33	58.9%
Warren	3,516	46	1.3%	11	23.9%
Warwick	14,807	224	1.5%	82	36.6%
West Greenwich	933	26	2.8%	10	38.5%
West Warwick	5,646	57	1.0%	41	71.9%
Westerly	4,871	184	3.8%	103	56.0%
Woonsocket	6,035	536	8.9%	156	29.1%

APPENDIX C: SOLAR VISBILITY ANALYSIS DATA TABLES

Table C.1: Logistic Regression of Minority Status on Daylight with Officer Fixed Effects, All Traffic Stops 2018

LHS: Minority Status		Non-Caucasian	Black	Hispanic	Black or Hispanic
Daylight	Coefficient	0.291***	0.168***	0.148***	0.146***
	Standard Error	(0.028)	(0.025)	(0.026)	(0.021)
Sample Size		49,412	46,378	46,193	53,384
Pseudo R^2		0.061	0.071	0.085	0.079

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 2018.

Table C.2: Logistic Regression of Minority Status on Daylight with Officer Fixed Effects, All Municipal Traffic Stops 2018

LHS: Minority Status		Non-Caucasian	Black	Hispanic	Black or Hispanic
Daylight	Coefficient	0.250***	0.172***	0.151***	0.149***
	Standard Error	(0.039)	(0.028)	(0.028)	(0.023)
Sample Size		44,039	41,530	41,395	47,780
Pseudo R^2		0.065	0.076	0.092	0.086

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 2018.

Table C.3: Logistic Regression of Minority Status on Daylight with Officer Fixed Effects, All State Police Traffic Stops 2018

LHS: Minority Status		Non-Caucasian	Black	Hispanic	Black or Hispanic
Daylight	Coefficient	0.228*	0.187	0.193**	0.207**
	Standard Error	(0.127)	(0.14)	(0.096)	(0.098)
Sample Size		4,340	4,150	4,085	4,885
Pseudo R^2		0.046	0.048	0.046	0.041

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 2018.

Table C.4: Logistic Regression of Minority Status on Daylight with Officer Fixed Effects, All Moving Violations 2018

LHS: Minority Status		Non-Caucasian	Black	Hispanic	Black or Hispanic
Daylight	Coefficient	0.287***	0.108***	0.090***	0.087***
	Standard Error	(0.035)	(0.035)	(0.028)	(0.028)
Sample Size		35,225	32,445	32,370	37,109
Pseudo R^2		0.065	0.07	0.086	0.079

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 moving violations made during the inter-twilight window in 2018.

Table C.5: Logistic Regression of Minority Status on Daylight with Officer Fixed Effects, All Municipal Moving Violations 2018

LHS: Minority Status		Non-Caucasian	Black	Hispanic	Black or Hispanic
Daylight	Coefficient	0.224***	0.105**	0.079***	0.082**
	Standard Error	(0.065)	(0.048)	(0.029)	(0.034)
Sample Size		31,454	29,163	29,081	33,287
Pseudo R^2		0.07	0.072	0.093	0.085

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 moving violations made during the inter-twilight window in 2018.

Table C.6: Logistic Regression of Minority Status on Daylight with Officer Fixed Effects, All State Police Moving Violations 2018

LHS: Minority Status		Non-Caucasian	Black	Hispanic	Black or Hispanic
Daylight	Coefficient	0.212	0.166	0.238**	0.206*
	Standard Error	(0.156)	(0.172)	(0.108)	(0.112)
Sample Size		2,891	2,731	2,726	3,242
Pseudo R^2		0.05	0.052	0.041	0.037

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 moving violations made during the inter-twilight window in 2018.

Table C.7: Logistic Regression of Minority Status on Daylight by Department, All Traffic Stops 2018

Department	Variable	Non-Caucasian	Black	Hispanic	Black or Hispanic
Barrington	Coefficient	0.103	0.021	-0.472	-0.125
	Standard Error	(0.270)	(0.215)	(0.407)	(0.188)
	P-Value	0.703	0.920	0.245	0.509
	Q-Value	0.768	0.930	N/A	N/A
	Observations	646	623	611	648
	Pseudo R2	0.026	0.026	0.064	0.032
Bristol	Coefficient	1.968***	0.754+	1.422***	0.964***
	Standard Error	(0.439)	(0.446)	(0.388)	(0.321)
	P-Value	0.001	0.092	0	0.003
	Q-Value	0.001	0.218	0.001	0.012
	Observations	1469	1380	1377	1409
	Pseudo R2	0.122	0.024	0.056	0.025
Burrillville	Coefficient	0.241	0.437	0.075	0.277
	Standard Error	(0.497)	(0.560)	(0.523)	(0.472)
	P-Value	0.625	0.435	0.884	0.556
	Q-Value	0.702	0.615	0.907	0.643
	Observations	1331	1325	1334	1356
	Pseudo R2	0.019	0.037	0.043	0.032
Central Falls	Coefficient	0.093	0.081	-0.236+	-0.126
	Standard Error	(0.136)	(0.135)	(0.127)	(0.125)
	P-Value	0.497	0.547	0.061	0.314
	Q-Value	0.643	0.643	N/A	N/A
	Observations	823	818	1236	1494
	Pseudo R2	0.024	0.025	0.013	0.014
Charlestown	Coefficient	0.136	-0.096	-0.277	-0.100
	Standard Error	(0.279)	(0.414)	(0.363)	(0.307)
	P-Value	0.626	0.816	0.444	0.745
	Q-Value	0.702	N/A	N/A	N/A
	Observations	1184	1142	968	1154
	Pseudo R2	0.027	0.030	0.026	0.020
Coventry	Coefficient	-0.017	0.224	1.174++	0.574+
	Standard Error	(0.291)	(0.374)	(0.578)	(0.347)
	P-Value	0.952	0.549	0.041	0.097
	Q-Value	N/A	0.643	0.119	0.223
	Observations	1280	1265	1251	1283
	Pseudo R2	0.014	0.027	0.050	0.019
Cranston	Coefficient	0.140+	0.199**	0.057	0.079
	Standard Error	(0.082)	(0.085)	(0.094)	(0.076)
	P-Value	0.093	0.019	0.550	0.305
	Q-Value	0.218	0.071	0.643	0.463
	Observations	5358	5101	5409	6472
	Pseudo R2	0.004	0.004	0.003	0.003
Cumberland	Coefficient	0.365	0.544	-0.024	0.182
	Standard Error	(0.224)	(0.340)	(0.203)	(0.174)
	P-Value	0.104	0.111	0.904	0.293
	Q-Value	0.224	0.224	N/A	0.463
	Observations	926	904	962	1013
	Pseudo R2	0.034	0.025	0.014	0.014

Table C.7: Logistic Regression of Minority Status on Daylight by Department, All Traffic Stops 2018

Department	Variable	Non-Caucasian	Black	Hispanic	Black or Hispanic
DEM	Coefficient	N/A	N/A	N/A	N/A
	Standard Error	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A
	Observations	N/A	N/A	N/A	N/A
	Pseudo R2	N/A	N/A	N/A	N/A
East Greenwich	Coefficient	N/A	N/A	N/A	N/A
	Standard Error	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A
	Observations	N/A	N/A	N/A	N/A
	Pseudo R2	N/A	N/A	N/A	N/A
East Providence	Coefficient	-0.156	-0.203+	-0.402+++	-0.245+++
	Standard Error	(0.104)	(0.116)	(0.112)	(0.086)
	P-Value	0.135	0.079	0	0.004
	Q-Value	N/A	N/A	0.001	N/A
	Observations	3325	3199	2794	3503
	Pseudo R2	0.007	0.008	0.013	0.008
Foster	Coefficient	N/A	N/A	N/A	N/A
	Standard Error	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A
	Observations	N/A	N/A	N/A	N/A
	Pseudo R2	N/A	N/A	N/A	N/A
Glocester	Coefficient	N/A	N/A	N/A	-0.090
	Standard Error	N/A	N/A	N/A	(0.287)
	P-Value	N/A	N/A	N/A	0.751
	Q-Value	N/A	N/A	N/A	N/A
	Observations	N/A	N/A	N/A	538
	Pseudo R2	N/A	N/A	N/A	0.050
Hopkinton	Coefficient	N/A	N/A	N/A	N/A
	Standard Error	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A
	Observations	N/A	N/A	N/A	N/A
	Pseudo R2	N/A	N/A	N/A	N/A
Jamestown	Coefficient	N/A	N/A	N/A	N/A
	Standard Error	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A
	Observations	N/A	N/A	N/A	N/A
	Pseudo R2	N/A	N/A	N/A	N/A
Johnston	Coefficient	-0.025	-0.067	0.046	-0.027
	Standard Error	(0.148)	(0.168)	(0.068)	(0.116)
	P-Value	0.865	0.691	0.492	0.818
	Q-Value	N/A	N/A	0.643	N/A
	Observations	1186	1157	1184	1305
	Pseudo R2	0.023	0.028	0.024	0.023

Table C.7: Logistic Regression of Minority Status on Daylight by Department, All Traffic Stops 2018

Department	Variable	Non-Caucasian	Black	Hispanic	Black or Hispanic
Lincoln	Coefficient	N/A	N/A	N/A	N/A
	Standard Error	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A
	Observations	N/A	N/A	N/A	N/A
	Pseudo R2	N/A	N/A	N/A	N/A
Little Compton	Coefficient	N/A	N/A	N/A	N/A
	Standard Error	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A
	Observations	N/A	N/A	N/A	N/A
	Pseudo R2	N/A	N/A	N/A	N/A
Middletown	Coefficient	-0.773+	-0.573	-0.187	-0.321
	Standard Error	(0.395)	(0.389)	(0.423)	(0.356)
	P-Value	0.050	0.142	0.658	0.365
	Q-Value	N/A	N/A	N/A	N/A
	Observations	564	558	546	603
	Pseudo R2	0.039	0.050	0.023	0.029
Narragansett	Coefficient	0.108	0.202	0.028	0.160
	Standard Error	(0.143)	(0.194)	(0.356)	(0.263)
	P-Value	0.451	0.301	0.935	0.541
	Q-Value	0.626	0.463	0.935	0.643
	Observations	1301	1283	1276	1352
	Pseudo R2	0.007	0.017	0.046	0.019
Newport	Coefficient	0.083	-0.081	0.330	0.114
	Standard Error	(0.137)	(0.133)	(0.243)	(0.159)
	P-Value	0.545	0.541	0.174	0.477
	Q-Value	0.643	N/A	0.312	0.643
	Observations	1531	1491	1408	1622
	Pseudo R2	0.016	0.017	0.008	0.012
North Kingstown	Coefficient	0.573++	-0.584	-0.094	-0.234
	Standard Error	(0.273)	(0.790)	(0.458)	(0.537)
	P-Value	0.037	0.458	0.836	0.662
	Q-Value	0.108	N/A	N/A	N/A
	Observations	840	666	660	689
	Pseudo R2	0.097	0.043	0.072	0.037
North Providence	Coefficient	-0.024	0.041	0.321**	0.135
	Standard Error	(0.180)	(0.141)	(0.130)	(0.126)
	P-Value	0.893	0.765	0.014	0.284
	Q-Value	N/A	0.815	0.054	0.460
	Observations	1314	1292	1242	1524
	Pseudo R2	0.014	0.014	0.014	0.008
North Smithfield	Coefficient	0.462***	0.469***	0.552++	0.501***
	Standard Error	(0.101)	(0.086)	(0.277)	(0.138)
	P-Value	0.001	0.001	0.046	0
	Q-Value	0.001	0.001	0.123	0.001
	Observations	737	698	743	864
	Pseudo R2	0.018	0.018	0.013	0.013

Table C.7: Logistic Regression of Minority Status on Daylight by Department, All Traffic Stops 2018

Department	Variable	Non-Caucasian	Black	Hispanic	Black or Hispanic
Pawtucket	Coefficient	0.344++	0.326++	0.261	0.282
	Standard Error	(0.158)	(0.164)	(0.216)	(0.181)
	P-Value	0.028	0.046	0.224	0.119
	Q-Value	0.100	0.123	0.384	0.232
	Observations	1682	1631	1555	2074
	Pseudo R2	0.023	0.024	0.017	0.017
Portsmouth	Coefficient	0.485***	0.435++	0.615***	0.492***
	Standard Error	(0.150)	(0.204)	(0.172)	(0.120)
	P-Value	0.001	0.034	0	0.001
	Q-Value	0.006	0.105	0.001	0.001
	Observations	1388	1366	1305	1458
	Pseudo R2	0.014	0.013	0.028	0.013
Providence	Coefficient	0.323	0.326	0.308	0.319
	Standard Error	(0.001)	(0.001)	(0.001)	(0.001)
	P-Value	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A
	Observations	2058	1966	2031	2902
	Pseudo R2	0.014	0.014	0.014	0.013
Richmond	Coefficient	0.375	-0.035	N/A	-0.050
	Standard Error	(0.388)	(0.398)	N/A	(0.216)
	P-Value	0.331	0.927	N/A	0.813
	Q-Value	0.493	N/A	N/A	N/A
	Observations	624	521	N/A	526
	Pseudo R2	0.046	0.019	N/A	0.013
RISP - Hope Valley	Coefficient	0.222	0.372	0.469**	0.397+
	Standard Error	(0.231)	(0.263)	(0.194)	(0.224)
	P-Value	0.337	0.158	0.016	0.076
	Q-Value	0.493	0.289	0.059	0.189
	Observations	860	811	793	930
	Pseudo R2	0.013	0.020	0.020	0.016
RISP - HQ	Coefficient	N/A	N/A	N/A	N/A
	Standard Error	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A
	Observations	N/A	N/A	N/A	N/A
	Pseudo R2	N/A	N/A	N/A	N/A
RISP - Lincoln	Coefficient	0.029	-0.064	-0.043	0
	Standard Error	(0.142)	(0.177)	(0.215)	(0.166)
	P-Value	0.833	0.712	0.838	0.999
	Q-Value	0.875	N/A	N/A	N/A
	Observations	1248	1192	1219	1455
	Pseudo R2	0.017	0.018	0.014	0.014
RISP - Portsmouth	Coefficient	N/A	N/A	N/A	N/A
	Standard Error	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A
	Observations	N/A	N/A	N/A	N/A
	Pseudo R2	N/A	N/A	N/A	N/A

Table C.7: Logistic Regression of Minority Status on Daylight by Department, All Traffic Stops 2018

Department	Variable	Non-Caucasian	Black	Hispanic	Black or Hispanic
RISP - Scituate	Coefficient	0.398	0.623++	0.671***	0.675***
	Standard Error	(0.250)	(0.291)	(0.203)	(0.184)
	P-Value	0.112	0.032	0.001	0
	Q-Value	0.224	0.105	0.004	0.001
	Observations	576	561	599	671
	Pseudo R2	0.028	0.030	0.032	0.026
RISP - Wickford	Coefficient	0.289+	0.259	0.187	0.217
	Standard Error	(0.151)	(0.160)	(0.222)	(0.151)
	P-Value	0.057	0.108	0.395	0.150
	Q-Value	0.146	0.224	0.569	0.280
	Observations	1307	1270	1207	1434
	Pseudo R2	0.012	0.012	0.007	0.006
Scituate	Coefficient	N/A	N/A	N/A	N/A
	Standard Error	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A
	Observations	N/A	N/A	N/A	N/A
	Pseudo R2	N/A	N/A	N/A	N/A
Smithfield	Coefficient	0.666***	0.727***	0.345	0.531***
	Standard Error	(0.174)	(0.230)	(0.324)	(0.131)
	P-Value	0	0.002	0.286	0.001
	Q-Value	0.001	0.007	0.460	0.001
	Observations	1257	1240	1241	1304
	Pseudo R2	0.026	0.034	0.017	0.017
South Kingstown	Coefficient	0.202	0.138	0.532++	0.162
	Standard Error	(0.180)	(0.291)	(0.254)	(0.256)
	P-Value	0.264	0.633	0.037	0.527
	Q-Value	0.442	0.702	0.108	0.643
	Observations	1360	1279	1221	1307
	Pseudo R2	0.030	0.023	0.028	0.017
Tiverton	Coefficient	N/A	N/A	N/A	0.591
	Standard Error	N/A	N/A	N/A	(0.361)
	P-Value	N/A	N/A	N/A	0.101
	Q-Value	N/A	N/A	N/A	0.224
	Observations	N/A	N/A	N/A	504
	Pseudo R2	N/A	N/A	N/A	0.027
Univ Of Rhode Island	Coefficient	-0.201	-0.100	-0.634++	-0.272
	Standard Error	(0.193)	(0.122)	(0.291)	(0.216)
	P-Value	0.296	0.409	0.029	0.206
	Q-Value	N/A	N/A	N/A	N/A
	Observations	607	573	554	617
	Pseudo R2	0.012	0.006	0.041	0.012
Warren	Coefficient	-0.273	-0.065	0.797	0.114
	Standard Error	(0.186)	(0.409)	(0.536)	(0.314)
	P-Value	0.141	0.871	0.136	0.716
	Q-Value	N/A	N/A	0.259	0.773
	Observations	965	926	899	946
	Pseudo R2	0.070	0.037	0.093	0.045

Table C.7: Logistic Regression of Minority Status on Daylight by Department, All Traffic Stops 2018

Department	Variable	Non-Caucasian	Black	Hispanic	Black or Hispanic
Warwick	Coefficient	0.958***	0.640***	0.574***	0.575***
	Standard Error	(0.083)	(0.079)	(0.151)	(0.100)
	P-Value	0.001	0.001	0	0.001
	Q-Value	0.004	0.001	0.001	0.001
	Observations	3825	3425	3424	3819
	Pseudo R2	0.030	0.017	0.012	0.014
West Greenwich	Coefficient	N/A	N/A	N/A	N/A
	Standard Error	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A
	Observations	N/A	N/A	N/A	N/A
	Pseudo R2	N/A	N/A	N/A	N/A
West Warwick	Coefficient	0.222	-0.303	-0.321	-0.331
	Standard Error	(0.367)	(0.212)	(0.268)	(0.216)
	P-Value	0.546	0.152	0.231	0.125
	Q-Value	0.643	N/A	N/A	N/A
	Observations	1711	1429	1436	1510
	Pseudo R2	0.020	0.021	0.010	0.014
Westerly	Coefficient	-0.023	0.199	0.725***	0.367
	Standard Error	(0.225)	(0.286)	(0.277)	(0.294)
	P-Value	0.919	0.485	0.008	0.212
	Q-Value	N/A	0.643	0.039	0.372
	Observations	1079	1041	1018	1070
	Pseudo R2	0.034	0.043	0.032	0.024
Woonsocket	Coefficient	0.259**	0.032	-0.177	-0.146
	Standard Error	(0.104)	(0.172)	(0.197)	(0.163)
	P-Value	0.013	0.853	0.372	0.367
	Q-Value	0.052	0.885	N/A	N/A
	Observations	1594	1289	1382	1551
	Pseudo R2	0.012	0.008	0.014	0.010

Table C.8: Logistic Regression of Minority Status on Daylight by Department with Officer Fixed-Effects, All Traffic Stops 2018

Department	Variable	Non-Caucasian	Black	Hispanic	Black or Hispanic
Barrington	Coefficient	-0.079	-0.216	N/A	-0.351+
	Standard Error	(0.347)	(0.245)	N/A	(0.209)
	P-Value	0.819	0.375	N/A	0.093
	Q-Value	N/A	N/A	N/A	N/A
	Observations	644	621	N/A	646
	Pseudo R2	0.075	0.090	N/A	0.105
Bristol	Coefficient	2.005***	0.846	1.378***	0.999***
	Standard Error	(0.495)	(0.555)	(0.389)	(0.367)
	P-Value	0.001	0.128	0	0.007
	Q-Value	0.001	0.275	0.001	0.028
	Observations	1383	1291	1184	1320
	Pseudo R2	0.180	0.071	0.076	0.054
Burrillville	Coefficient	0.229	0.508	0.039	0.250
	Standard Error	(0.560)	(0.615)	(0.584)	(0.527)
	P-Value	0.681	0.409	0.947	0.634
	Q-Value	0.745	0.555	0.958	0.726
	Observations	1277	1241	1305	1347
	Pseudo R2	0.050	0.071	0.075	0.048
Central Falls	Coefficient	0.130	0.118	-0.236	-0.119
	Standard Error	(0.173)	(0.170)	(0.153)	(0.150)
	P-Value	0.451	0.488	0.125	0.425
	Q-Value	0.583	0.601	N/A	N/A
	Observations	820	815	1230	1486
	Pseudo R2	0.057	0.057	0.028	0.030
Charlestown	Coefficient	0.122	-0.116	-0.338	-0.098
	Standard Error	(0.279)	(0.404)	(0.356)	(0.289)
	P-Value	0.662	0.772	0.342	0.734
	Q-Value	0.745	N/A	N/A	N/A
	Observations	1184	1091	878	1103
	Pseudo R2	0.039	0.052	0.057	0.039
Coventry	Coefficient	0.028	0.294	1.116++	0.606++
	Standard Error	(0.310)	(0.351)	(0.551)	(0.310)
	P-Value	0.925	0.402	0.043	0.050
	Q-Value	0.949	0.555	0.127	0.136
	Observations	1141	1115	1115	1207
	Pseudo R2	0.059	0.078	0.101	0.048
Cranston	Coefficient	0.138	0.210**	0.079	0.094
	Standard Error	(0.086)	(0.092)	(0.101)	(0.082)
	P-Value	0.104	0.021	0.430	0.252
	Q-Value	0.252	0.075	0.565	0.448
	Observations	5324	5056	5377	6454
	Pseudo R2	0.041	0.050	0.046	0.043
Cumberland	Coefficient	0.361	0.535	0.041	0.201
	Standard Error	(0.234)	(0.365)	(0.226)	(0.185)
	P-Value	0.123	0.143	0.851	0.277
	Q-Value	0.273	0.286	0.885	0.456
	Observations	894	872	939	989
	Pseudo R2	0.052	0.056	0.032	0.029

Table C.8: Logistic Regression of Minority Status on Daylight by Department with Officer Fixed-Effects, All Traffic Stops 2018

Department	Variable	Non-Caucasian	Black	Hispanic	Black or Hispanic
DEM	Coefficient	N/A	N/A	N/A	N/A
	Standard Error	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A
	Observations	N/A	N/A	N/A	N/A
	Pseudo R2	N/A	N/A	N/A	N/A
East Greenwich	Coefficient	N/A	N/A	N/A	N/A
	Standard Error	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A
	Observations	N/A	N/A	N/A	N/A
	Pseudo R2	N/A	N/A	N/A	N/A
East Providence	Coefficient	-0.014	-0.046	-0.203	-0.082
	Standard Error	(0.108)	(0.111)	(0.140)	(0.094)
	P-Value	0.893	0.670	0.143	0.379
	Q-Value	N/A	N/A	N/A	N/A
	Observations	3320	3190	2764	3493
	Pseudo R2	0.037	0.041	0.057	0.046
Foster	Coefficient	N/A	N/A	N/A	N/A
	Standard Error	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A
	Observations	N/A	N/A	N/A	N/A
	Pseudo R2	N/A	N/A	N/A	N/A
Glocester	Coefficient	N/A	N/A	N/A	-0.008
	Standard Error	N/A	N/A	N/A	(0.305)
	P-Value	N/A	N/A	N/A	0.975
	Q-Value	N/A	N/A	N/A	N/A
	Observations	N/A	N/A	N/A	527
	Pseudo R2	N/A	N/A	N/A	0.057
Hopkinton	Coefficient	N/A	N/A	N/A	N/A
	Standard Error	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A
	Observations	N/A	N/A	N/A	N/A
	Pseudo R2	N/A	N/A	N/A	N/A
Jamestown	Coefficient	N/A	N/A	N/A	N/A
	Standard Error	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A
	Observations	N/A	N/A	N/A	N/A
	Pseudo R2	N/A	N/A	N/A	N/A
Johnston	Coefficient	-0.037	-0.097	0.023	-0.032
	Standard Error	(0.146)	(0.158)	(0.086)	(0.128)
	P-Value	0.801	0.537	0.788	0.794
	Q-Value	N/A	N/A	0.830	N/A
	Observations	1166	1137	1157	1288
	Pseudo R2	0.035	0.048	0.064	0.052

Table C.8: Logistic Regression of Minority Status on Daylight by Department with Officer Fixed-Effects, All Traffic Stops 2018

Department	Variable	Non-Caucasian	Black	Hispanic	Black or Hispanic
Lincoln	Coefficient	N/A	N/A	N/A	N/A
	Standard Error	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A
	Observations	N/A	N/A	N/A	N/A
	Pseudo R2	N/A	N/A	N/A	N/A
Little Compton	Coefficient	N/A	N/A	N/A	N/A
	Standard Error	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A
	Observations	N/A	N/A	N/A	N/A
	Pseudo R2	N/A	N/A	N/A	N/A
Middletown	Coefficient	-1.042++	N/A	-0.323	-0.528
	Standard Error	(0.453)	N/A	(0.435)	(0.349)
	P-Value	0.021	N/A	0.458	0.129
	Q-Value	N/A	N/A	N/A	N/A
	Observations	527	N/A	524	593
	Pseudo R2	0.079	N/A	0.071	0.071
Narragansett	Coefficient	0.145	0.225	0.159	0.226
	Standard Error	(0.136)	(0.196)	(0.402)	(0.284)
	P-Value	0.280	0.250	0.689	0.423
	Q-Value	0.456	0.448	0.745	0.564
	Observations	1194	1138	1199	1295
	Pseudo R2	0.024	0.039	0.086	0.052
Newport	Coefficient	0.054	-0.119	0.282	0.076
	Standard Error	(0.134)	(0.127)	(0.238)	(0.152)
	P-Value	0.688	0.347	0.234	0.614
	Q-Value	0.745	N/A	0.437	0.712
	Observations	1517	1470	1352	1617
	Pseudo R2	0.037	0.052	0.035	0.039
North Kingstown	Coefficient	0.606++	-0.703	N/A	-0.361
	Standard Error	(0.307)	(0.786)	N/A	(0.492)
	P-Value	0.048	0.370	N/A	0.462
	Q-Value	0.136	N/A	N/A	N/A
	Observations	800	525	N/A	603
	Pseudo R2	0.145	0.065	N/A	0.067
North Providence	Coefficient	-0.092	-0.027	0.246**	0.071
	Standard Error	(0.158)	(0.123)	(0.107)	(0.100)
	P-Value	0.561	0.824	0.020	0.470
	Q-Value	N/A	N/A	0.075	0.597
	Observations	1307	1285	1228	1515
	Pseudo R2	0.025	0.024	0.035	0.021
North Smithfield	Coefficient	0.398***	0.365**	0.526+	0.412***
	Standard Error	(0.142)	(0.142)	(0.273)	(0.143)
	P-Value	0.004	0.009	0.054	0.004
	Q-Value	0.023	0.041	0.145	0.019
	Observations	729	682	739	860
	Pseudo R2	0.035	0.041	0.041	0.035

Table C.8: Logistic Regression of Minority Status on Daylight by Department with Officer Fixed-Effects, All Traffic Stops 2018

Department	Variable	Non-Caucasian	Black	Hispanic	Black or Hispanic
Pawtucket	Coefficient	0.256***	0.252**	0.172	0.195
	Standard Error	(0.096)	(0.112)	(0.164)	(0.126)
	P-Value	0.007	0.024	0.296	0.119
	Q-Value	0.030	0.079	0.463	0.273
	Observations	1675	1626	1550	2068
	Pseudo R2	0.079	0.083	0.063	0.070
Portsmouth	Coefficient	0.537***	0.477++	0.628***	0.517***
	Standard Error	(0.178)	(0.231)	(0.192)	(0.144)
	P-Value	0.002	0.039	0.001	0
	Q-Value	0.014	0.119	0.007	0.001
	Observations	1338	1316	1222	1446
	Pseudo R2	0.037	0.032	0.052	0.039
Providence	Coefficient	0.323	0.326	0.308	0.319
	Standard Error	(0.001)	(0.001)	(0.001)	(0.001)
	P-Value	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A
	Observations	2058	1966	2031	2902
	Pseudo R2	0.014	0.014	0.014	0.013
Richmond	Coefficient	0.351	N/A	N/A	N/A
	Standard Error	(0.389)	N/A	N/A	N/A
	P-Value	0.368	N/A	N/A	N/A
	Q-Value	0.526	N/A	N/A	N/A
	Observations	598	N/A	N/A	N/A
	Pseudo R2	0.046	N/A	N/A	N/A
RISP - Hope Valley	Coefficient	0.246	0.411	0.375+	0.361
	Standard Error	(0.245)	(0.280)	(0.218)	(0.241)
	P-Value	0.312	0.143	0.086	0.135
	Q-Value	0.472	0.286	0.222	0.284
	Observations	860	786	756	920
	Pseudo R2	0.056	0.061	0.061	0.046
RISP - HQ	Coefficient	N/A	N/A	N/A	N/A
	Standard Error	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A
	Observations	N/A	N/A	N/A	N/A
	Pseudo R2	N/A	N/A	N/A	N/A
RISP - Lincoln	Coefficient	0.043	-0.071	-0.085	-0.034
	Standard Error	(0.119)	(0.164)	(0.217)	(0.159)
	P-Value	0.718	0.662	0.694	0.829
	Q-Value	0.767	N/A	N/A	N/A
	Observations	1239	1170	1200	1455
	Pseudo R2	0.050	0.054	0.048	0.048
RISP - Portsmouth	Coefficient	N/A	N/A	N/A	N/A
	Standard Error	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A
	Observations	N/A	N/A	N/A	N/A
	Pseudo R2	N/A	N/A	N/A	N/A

Table C.8: Logistic Regression of Minority Status on Daylight by Department with Officer Fixed-Effects, All Traffic Stops 2018

Department	Variable	Non-Caucasian	Black	Hispanic	Black or Hispanic
RISP - Scituate	Coefficient	0.248	0.405	0.587**	0.588***
	Standard Error	(0.300)	(0.379)	(0.266)	(0.209)
	P-Value	0.409	0.286	0.027	0.004
	Q-Value	0.555	0.456	0.086	0.023
	Observations	576	551	587	671
	Pseudo R2	0.082	0.097	0.068	0.068
RISP - Wickford	Coefficient	0.226	0.212	0.129	0.171
	Standard Error	(0.158)	(0.170)	(0.210)	(0.150)
	P-Value	0.152	0.209	0.537	0.259
	Q-Value	0.298	0.400	0.652	0.449
	Observations	1307	1258	1173	1434
	Pseudo R2	0.050	0.046	0.039	0.037
Scituate	Coefficient	N/A	N/A	N/A	N/A
	Standard Error	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A
	Observations	N/A	N/A	N/A	N/A
	Pseudo R2	N/A	N/A	N/A	N/A
Smithfield	Coefficient	0.708***	0.726***	0.328	0.533***
	Standard Error	(0.173)	(0.247)	(0.335)	(0.116)
	P-Value	0.001	0.003	0.326	0.001
	Q-Value	0.001	0.018	0.483	0.001
	Observations	1242	1206	1172	1289
	Pseudo R2	0.046	0.054	0.029	0.037
South Kingstown	Coefficient	0.323+	0.212	0.680***	0.272
	Standard Error	(0.195)	(0.307)	(0.185)	(0.264)
	P-Value	0.098	0.486	0	0.303
	Q-Value	0.247	0.601	0.001	0.467
	Observations	1333	1222	1124	1250
	Pseudo R2	0.061	0.045	0.074	0.037
Tiverton	Coefficient	N/A	N/A	N/A	N/A
	Standard Error	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A
	Observations	N/A	N/A	N/A	N/A
	Pseudo R2	N/A	N/A	N/A	N/A
Univ Of Rhode Island	Coefficient	-0.178	-0.056	-0.546++	-0.223
	Standard Error	(0.211)	(0.146)	(0.254)	(0.214)
	P-Value	0.400	0.703	0.032	0.296
	Q-Value	N/A	N/A	N/A	N/A
	Observations	607	573	554	617
	Pseudo R2	0.016	0.014	0.054	0.019
Warren	Coefficient	-0.397++	-0.209	0.978	0.007
	Standard Error	(0.156)	(0.444)	(0.609)	(0.307)
	P-Value	0.010	0.635	0.108	0.982
	Q-Value	N/A	N/A	0.254	0.982
	Observations	899	860	833	880
	Pseudo R2	0.143	0.082	0.170	0.075

Table C.8: Logistic Regression of Minority Status on Daylight by Department with Officer Fixed-Effects, All Traffic Stops 2018

Department	Variable	Non-Caucasian	Black	Hispanic	Black or Hispanic
Warwick	Coefficient	0.859***	0.523***	0.550***	0.518***
	Standard Error	(0.107)	(0.087)	(0.168)	(0.119)
	P-Value	0.001	0.001	0.001	0.001
	Q-Value	0.001	0.001	0.007	0.001
	Observations	3815	3395	3329	3809
	Pseudo R2	0.078	0.067	0.068	0.057
West Greenwich	Coefficient	N/A	N/A	N/A	N/A
	Standard Error	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A
	Observations	N/A	N/A	N/A	N/A
	Pseudo R2	N/A	N/A	N/A	N/A
West Warwick	Coefficient	0.398	-0.259	-0.308	-0.312+
	Standard Error	(0.365)	(0.188)	(0.219)	(0.162)
	P-Value	0.273	0.167	0.159	0.054
	Q-Value	0.456	N/A	N/A	N/A
	Observations	1711	1394	1419	1503
	Pseudo R2	0.138	0.056	0.043	0.037
Westerly	Coefficient	-0.067	0.172	0.679**	0.312
	Standard Error	(0.257)	(0.316)	(0.293)	(0.335)
	P-Value	0.796	0.586	0.020	0.351
	Q-Value	N/A	0.699	0.075	0.509
	Observations	1051	984	869	1032
	Pseudo R2	0.061	0.071	0.063	0.052
Woonsocket	Coefficient	0.312***	0.085	-0.054	-0.059
	Standard Error	(0.075)	(0.159)	(0.157)	(0.131)
	P-Value	0.001	0.597	0.731	0.654
	Q-Value	0.001	0.702	N/A	N/A
	Observations	1574	1277	1369	1545
	Pseudo R2	0.035	0.018	0.028	0.020

Table C.9: Logistic Regression of Minority Status on Daylight by Department, All Moving Violations 2018

Department	Variable	Non-Caucasian	Black	Hispanic	Black or Hispanic
Barrington	Coefficient	0.182	0.089	-0.500	-0.115
	Standard Error	(0.222)	(0.188)	(0.462)	(0.172)
	P-Value	0.409	0.637	0.280	0.507
	Q-Value	0.712	0.843	N/A	N/A
	Observations	541	521	507	541
	Pseudo R2	0.019	0.017	0.046	0.020
Bristol	Coefficient	2.201***	0.981++	1.491***	1.111***
	Standard Error	(0.474)	(0.497)	(0.500)	(0.375)
	P-Value	0.001	0.048	0.003	0.003
	Q-Value	0.001	0.192	0.025	0.025
	Observations	1117	1031	1032	1054
	Pseudo R2	0.157	0.057	0.061	0.039
Burrillville	Coefficient	0.067	0.174	-0.143	0.104
	Standard Error	(0.497)	(0.606)	(0.495)	(0.356)
	P-Value	0.893	0.773	0.772	0.768
	Q-Value	0.921	0.903	N/A	0.903
	Observations	955	950	956	972
	Pseudo R2	0.025	0.046	0.035	0.037
Central Falls	Coefficient	0.168	0.155	-0.212	-0.068
	Standard Error	(0.151)	(0.150)	(0.165)	(0.153)
	P-Value	0.266	0.300	0.194	0.656
	Q-Value	0.541	0.574	N/A	N/A
	Observations	663	658	972	1184
	Pseudo R2	0.018	0.018	0.010	0.010
Charlestown	Coefficient	0.202	0.156	0.217	0.180
	Standard Error	(0.310)	(0.386)	(0.143)	(0.221)
	P-Value	0.514	0.686	0.130	0.416
	Q-Value	0.739	0.875	0.340	0.712
	Observations	1051	1013	860	1022
	Pseudo R2	0.028	0.032	0.027	0.020
Coventry	Coefficient	-0.328	0.111	-0.180	0.160
	Standard Error	(0.377)	(0.442)	(0.555)	(0.395)
	P-Value	0.384	0.802	0.745	0.685
	Q-Value	N/A	0.903	N/A	0.875
	Observations	799	693	683	702
	Pseudo R2	0.032	0.016	0.061	0.012
Cranston	Coefficient	0.061	0.141	0.059	0.059
	Standard Error	(0.109)	(0.108)	(0.112)	(0.089)
	P-Value	0.574	0.194	0.592	0.497
	Q-Value	0.794	0.451	0.800	0.739
	Observations	3458	3268	3451	4054
	Pseudo R2	0.006	0.007	0.006	0.004
Cumberland	Coefficient	-0.142	-0.165	-0.152	-0.054
	Standard Error	(0.250)	(0.449)	(0.303)	(0.270)
	P-Value	0.569	0.712	0.614	0.841
	Q-Value	N/A	N/A	N/A	N/A
	Observations	758	739	788	821
	Pseudo R2	0.017	0.012	0.028	0.014

Table C.9: Logistic Regression of Minority Status on Daylight by Department, All Moving Violations 2018

Department	Variable	Non-Caucasian	Black	Hispanic	Black or Hispanic
DEM	Coefficient	N/A	N/A	N/A	N/A
	Standard Error	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A
	Observations	N/A	N/A	N/A	N/A
	Pseudo R2	N/A	N/A	N/A	N/A
East Greenwich	Coefficient	N/A	N/A	N/A	N/A
	Standard Error	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A
	Observations	N/A	N/A	N/A	N/A
	Pseudo R2	N/A	N/A	N/A	N/A
East Providence	Coefficient	-0.046	-0.104	-0.377+	-0.175
	Standard Error	(0.129)	(0.130)	(0.226)	(0.119)
	P-Value	0.726	0.428	0.096	0.142
	Q-Value	N/A	N/A	N/A	N/A
	Observations	1948	1847	1634	1978
	Pseudo R2	0.008	0.008	0.010	0.007
Foster	Coefficient	N/A	N/A	N/A	N/A
	Standard Error	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A
	Observations	N/A	N/A	N/A	N/A
	Pseudo R2	N/A	N/A	N/A	N/A
Glocester	Coefficient	N/A	N/A	N/A	N/A
	Standard Error	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A
	Observations	N/A	N/A	N/A	N/A
	Pseudo R2	N/A	N/A	N/A	N/A
Hopkinton	Coefficient	N/A	N/A	N/A	N/A
	Standard Error	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A
	Observations	N/A	N/A	N/A	N/A
	Pseudo R2	N/A	N/A	N/A	N/A
Jamestown	Coefficient	N/A	N/A	N/A	N/A
	Standard Error	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A
	Observations	N/A	N/A	N/A	N/A
	Pseudo R2	N/A	N/A	N/A	N/A
Johnston	Coefficient	-0.367+++	-0.405+++	-0.128	-0.248+
	Standard Error	(0.136)	(0.136)	(0.130)	(0.136)
	P-Value	0.007	0.003	0.326	0.068
	Q-Value	N/A	N/A	N/A	N/A
	Observations	958	931	945	1037
	Pseudo R2	0.028	0.039	0.028	0.034

Table C.9: Logistic Regression of Minority Status on Daylight by Department, All Moving Violations 2018

Department	Variable	Non-Caucasian	Black	Hispanic	Black or Hispanic
Lincoln	Coefficient	N/A	N/A	N/A	N/A
	Standard Error	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A
	Observations	N/A	N/A	N/A	N/A
	Pseudo R2	N/A	N/A	N/A	N/A
Little Compton	Coefficient	N/A	N/A	N/A	N/A
	Standard Error	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A
	Observations	N/A	N/A	N/A	N/A
	Pseudo R2	N/A	N/A	N/A	N/A
Middletown	Coefficient	N/A	N/A	N/A	-0.388
	Standard Error	N/A	N/A	N/A	(0.352)
	P-Value	N/A	N/A	N/A	0.272
	Q-Value	N/A	N/A	N/A	N/A
	Observations	N/A	N/A	N/A	505
	Pseudo R2	N/A	N/A	N/A	0.039
Narragansett	Coefficient	-0.093	-0.078	0.081	0.072
	Standard Error	(0.112)	(0.145)	(0.397)	(0.275)
	P-Value	0.405	0.593	0.837	0.792
	Q-Value	N/A	N/A	0.907	0.903
	Observations	1074	1058	1056	1111
	Pseudo R2	0.019	0.024	0.057	0.028
Newport	Coefficient	0.143	-0.007	0.393	0.194
	Standard Error	(0.192)	(0.177)	(0.244)	(0.168)
	P-Value	0.455	0.968	0.107	0.250
	Q-Value	0.739	N/A	0.340	0.527
	Observations	1010	979	934	1050
	Pseudo R2	0.030	0.032	0.016	0.017
North Kingstown	Coefficient	0.536++	N/A	N/A	0.089
	Standard Error	(0.246)	N/A	N/A	(0.402)
	P-Value	0.028	N/A	N/A	0.824
	Q-Value	0.135	N/A	N/A	0.907
	Observations	725	N/A	N/A	567
	Pseudo R2	0.115	N/A	N/A	0.048
North Providence	Coefficient	-0.130	0.001	0.028	-0.008
	Standard Error	(0.209)	(0.151)	(0.180)	(0.146)
	P-Value	0.528	0.994	0.873	0.949
	Q-Value	N/A	0.994	0.921	N/A
	Observations	874	857	833	980
	Pseudo R2	0.014	0.013	0.016	0.008
North Smithfield	Coefficient	N/A	N/A	N/A	N/A
	Standard Error	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A
	Observations	N/A	N/A	N/A	N/A
	Pseudo R2	N/A	N/A	N/A	N/A

Table C.9: Logistic Regression of Minority Status on Daylight by Department, All Moving Violations 2018

Department	Variable	Non-Caucasian	Black	Hispanic	Black or Hispanic
Pawtucket	Coefficient	0.386+	0.296	0.149	0.187
	Standard Error	(0.200)	(0.214)	(0.232)	(0.225)
	P-Value	0.052	0.165	0.523	0.404
	Q-Value	0.192	0.414	0.739	0.712
	Observations	1031	986	948	1239
	Pseudo R2	0.030	0.035	0.023	0.027
Portsmouth	Coefficient	0.289	0.252	-0.075	0.134
	Standard Error	(0.189)	(0.231)	(0.349)	(0.206)
	P-Value	0.128	0.275	0.828	0.517
	Q-Value	0.340	0.541	N/A	0.739
	Observations	838	823	784	871
	Pseudo R2	0.016	0.014	0.016	0.010
Providence	Coefficient	0.237	0.250	0.335	0.310
	Standard Error	(0.001)	(0.001)	(0.001)	(0.001)
	P-Value	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A
	Observations	1465	1392	1495	2074
	Pseudo R2	0.012	0.013	0.010	0.009
Richmond	Coefficient	0.501	N/A	N/A	N/A
	Standard Error	(0.324)	N/A	N/A	N/A
	P-Value	0.123	N/A	N/A	N/A
	Q-Value	0.340	N/A	N/A	N/A
	Observations	582	N/A	N/A	N/A
	Pseudo R2	0.054	N/A	N/A	N/A
RISP - Hope Valley	Coefficient	0.291	0.490+	0.521++	0.476++
	Standard Error	(0.222)	(0.250)	(0.229)	(0.216)
	P-Value	0.189	0.050	0.023	0.028
	Q-Value	0.451	0.192	0.123	0.135
	Observations	645	601	586	692
	Pseudo R2	0.017	0.028	0.027	0.018
RISP - HQ	Coefficient	N/A	N/A	N/A	N/A
	Standard Error	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A
	Observations	N/A	N/A	N/A	N/A
	Pseudo R2	N/A	N/A	N/A	N/A
RISP - Lincoln	Coefficient	-0.331++	-0.400++	-0.273	-0.317++
	Standard Error	(0.143)	(0.179)	(0.170)	(0.136)
	P-Value	0.020	0.025	0.108	0.019
	Q-Value	N/A	N/A	N/A	N/A
	Observations	749	710	718	860
	Pseudo R2	0.014	0.018	0.013	0.010
RISP - Portsmouth	Coefficient	N/A	N/A	N/A	N/A
	Standard Error	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A
	Observations	N/A	N/A	N/A	N/A
	Pseudo R2	N/A	N/A	N/A	N/A

Table C.9: Logistic Regression of Minority Status on Daylight by Department, All Moving Violations 2018

Department	Variable	Non-Caucasian	Black	Hispanic	Black or Hispanic
RISP - Scituate	Coefficient	N/A	N/A	N/A	N/A
	Standard Error	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A
	Observations	N/A	N/A	N/A	N/A
	Pseudo R2	N/A	N/A	N/A	N/A
RISP - Wickford	Coefficient	0.365	0.268	0.173	0.228
	Standard Error	(0.229)	(0.231)	(0.245)	(0.199)
	P-Value	0.109	0.246	0.479	0.252
	Q-Value	0.340	0.527	0.739	0.527
	Observations	835	809	769	914
	Pseudo R2	0.018	0.017	0.004	0.007
Scituate	Coefficient	N/A	N/A	N/A	N/A
	Standard Error	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A
	Observations	N/A	N/A	N/A	N/A
	Pseudo R2	N/A	N/A	N/A	N/A
Smithfield	Coefficient	0.765***	0.874**	0.263	0.500***
	Standard Error	(0.266)	(0.347)	(0.405)	(0.145)
	P-Value	0.004	0.012	0.514	0.001
	Q-Value	0.028	0.071	0.739	0.001
	Observations	1111	1094	1097	1149
	Pseudo R2	0.032	0.037	0.018	0.020
South Kingstown	Coefficient	0.064	-0.004	0.528	0.075
	Standard Error	(0.197)	(0.337)	(0.340)	(0.307)
	P-Value	0.742	0.991	0.120	0.806
	Q-Value	0.903	N/A	0.340	0.903
	Observations	1174	1095	1047	1119
	Pseudo R2	0.037	0.035	0.041	0.027
Tiverton	Coefficient	N/A	N/A	N/A	N/A
	Standard Error	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A
	Observations	N/A	N/A	N/A	N/A
	Pseudo R2	N/A	N/A	N/A	N/A
Univ Of Rhode Island	Coefficient	N/A	N/A	N/A	N/A
	Standard Error	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A
	Observations	N/A	N/A	N/A	N/A
	Pseudo R2	N/A	N/A	N/A	N/A
Warren	Coefficient	-0.240	-0.194	0.901+	0.050
	Standard Error	(0.168)	(0.493)	(0.523)	(0.361)
	P-Value	0.153	0.694	0.086	0.888
	Q-Value	N/A	N/A	0.293	0.921
	Observations	788	750	733	768
	Pseudo R2	0.087	0.035	0.094	0.046

Table C.9: Logistic Regression of Minority Status on Daylight by Department, All Moving Violations 2018

Department	Variable	Non-Caucasian	Black	Hispanic	Black or Hispanic
Warwick	Coefficient	1.138***	0.610***	0.458***	0.512***
	Standard Error	(0.115)	(0.128)	(0.151)	(0.090)
	P-Value	0.001	0.001	0.003	0.001
	Q-Value	0.013	0.001	0.025	0.001
	Observations	2625	2251	2263	2485
	Pseudo R2	0.039	0.016	0.010	0.012
West Greenwich	Coefficient	N/A	N/A	N/A	N/A
	Standard Error	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A
	Observations	N/A	N/A	N/A	N/A
	Pseudo R2	N/A	N/A	N/A	N/A
West Warwick	Coefficient	0.273	-0.184	-0.391	-0.354
	Standard Error	(0.377)	(0.192)	(0.338)	(0.270)
	P-Value	0.467	0.337	0.247	0.190
	Q-Value	0.739	N/A	N/A	N/A
	Observations	1394	1116	1127	1178
	Pseudo R2	0.025	0.019	0.023	0.017
Westerly	Coefficient	-0.165	0.012	0.976***	0.247
	Standard Error	(0.210)	(0.231)	(0.351)	(0.259)
	P-Value	0.432	0.957	0.004	0.340
	Q-Value	N/A	0.972	0.035	0.633
	Observations	795	665	747	786
	Pseudo R2	0.052	0.035	0.059	0.032
Woonsocket	Coefficient	0.284++	0.107	-0.266	-0.159
	Standard Error	(0.131)	(0.337)	(0.273)	(0.240)
	P-Value	0.032	0.751	0.331	0.508
	Q-Value	0.136	0.903	N/A	N/A
	Observations	1101	810	872	966
	Pseudo R2	0.023	0.024	0.021	0.020

Table C.10: Logistic Regression of Minority Status on Daylight by Department with Officer Fixed-Effects, All Moving Violations 2018

Department	Variable	Non-Caucasian	Black	Hispanic	Black or Hispanic
Barrington	Coefficient	-0.035	N/A	N/A	-0.263
	Standard Error	(0.333)	N/A	N/A	(0.181)
	P-Value	0.916	N/A	N/A	0.148
	Q-Value	N/A	N/A	N/A	N/A
	Observations	539	N/A	N/A	501
	Pseudo R2	0.082	N/A	N/A	0.107
Bristol	Coefficient	2.190***	1.146+	1.560***	1.228***
	Standard Error	(0.555)	(0.615)	(0.500)	(0.435)
	P-Value	0	0.061	0.002	0.004
	Q-Value	0.001	0.207	0.013	0.028
	Observations	1047	959	880	982
	Pseudo R2	0.240	0.093	0.101	0.075
Burrillville	Coefficient	-0.027	0.089	-0.238	-0.017
	Standard Error	(0.490)	(0.573)	(0.620)	(0.405)
	P-Value	0.955	0.875	0.700	0.966
	Q-Value	N/A	0.888	N/A	N/A
	Observations	901	819	844	918
	Pseudo R2	0.063	0.096	0.081	0.063
Central Falls	Coefficient	0.184	0.167	-0.214	-0.057
	Standard Error	(0.195)	(0.190)	(0.201)	(0.187)
	P-Value	0.349	0.379	0.287	0.754
	Q-Value	0.643	0.643	N/A	N/A
	Observations	660	655	967	1177
	Pseudo R2	0.061	0.061	0.037	0.037
Charlestown	Coefficient	0.165	0.116	0.181	0.162
	Standard Error	(0.331)	(0.398)	(0.197)	(0.210)
	P-Value	0.616	0.769	0.358	0.441
	Q-Value	0.711	0.810	0.643	0.662
	Observations	1051	967	779	976
	Pseudo R2	0.041	0.050	0.052	0.035
Coventry	Coefficient	-0.236	0.180	-0.232	0.264
	Standard Error	(0.397)	(0.470)	(0.625)	(0.414)
	P-Value	0.551	0.703	0.709	0.523
	Q-Value	N/A	0.767	N/A	0.711
	Observations	632	541	540	627
	Pseudo R2	0.089	0.052	0.119	0.041
Cranston	Coefficient	0.086	0.173+	0.076	0.072
	Standard Error	(0.103)	(0.104)	(0.112)	(0.086)
	P-Value	0.407	0.096	0.495	0.404
	Q-Value	0.643	0.275	0.708	0.643
	Observations	3425	3230	3410	4030
	Pseudo R2	0.057	0.065	0.059	0.056
Cumberland	Coefficient	-0.197	-0.294	-0.133	-0.107
	Standard Error	(0.240)	(0.414)	(0.293)	(0.243)
	P-Value	0.411	0.476	0.651	0.658
	Q-Value	N/A	N/A	N/A	N/A
	Observations	731	712	769	801
	Pseudo R2	0.035	0.063	0.039	0.029

Table C.10: Logistic Regression of Minority Status on Daylight by Department with Officer Fixed-Effects, All Moving Violations 2018

Department	Variable	Non-Caucasian	Black	Hispanic	Black or Hispanic
DEM	Coefficient	N/A	N/A	N/A	N/A
	Standard Error	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A
	Observations	N/A	N/A	N/A	N/A
	Pseudo R2	N/A	N/A	N/A	N/A
East Greenwich	Coefficient	N/A	N/A	N/A	N/A
	Standard Error	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A
	Observations	N/A	N/A	N/A	N/A
	Pseudo R2	N/A	N/A	N/A	N/A
East Providence	Coefficient	0.118	0.064	-0.144	-0.004
	Standard Error	(0.137)	(0.126)	(0.277)	(0.145)
	P-Value	0.389	0.606	0.601	0.971
	Q-Value	0.643	0.711	N/A	N/A
	Observations	1942	1838	1565	1971
	Pseudo R2	0.048	0.048	0.072	0.048
Foster	Coefficient	N/A	N/A	N/A	N/A
	Standard Error	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A
	Observations	N/A	N/A	N/A	N/A
	Pseudo R2	N/A	N/A	N/A	N/A
Glocester	Coefficient	N/A	N/A	N/A	N/A
	Standard Error	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A
	Observations	N/A	N/A	N/A	N/A
	Pseudo R2	N/A	N/A	N/A	N/A
Hopkinton	Coefficient	N/A	N/A	N/A	N/A
	Standard Error	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A
	Observations	N/A	N/A	N/A	N/A
	Pseudo R2	N/A	N/A	N/A	N/A
Jamestown	Coefficient	N/A	N/A	N/A	N/A
	Standard Error	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A
	Observations	N/A	N/A	N/A	N/A
	Pseudo R2	N/A	N/A	N/A	N/A
Johnston	Coefficient	-0.382+++	-0.432+++	-0.118	-0.226
	Standard Error	(0.136)	(0.131)	(0.181)	(0.165)
	P-Value	0.004	0.001	0.518	0.171
	Q-Value	N/A	N/A	N/A	N/A
	Observations	945	918	927	1024
	Pseudo R2	0.037	0.048	0.052	0.048

Table C.10: Logistic Regression of Minority Status on Daylight by Department with Officer Fixed-Effects, All Moving Violations 2018

Department	Variable	Non-Caucasian	Black	Hispanic	Black or Hispanic
Lincoln	Coefficient	N/A	N/A	N/A	N/A
	Standard Error	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A
	Observations	N/A	N/A	N/A	N/A
	Pseudo R2	N/A	N/A	N/A	N/A
Little Compton	Coefficient	N/A	N/A	N/A	N/A
	Standard Error	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A
	Observations	N/A	N/A	N/A	N/A
	Pseudo R2	N/A	N/A	N/A	N/A
Middletown	Coefficient	N/A	N/A	N/A	N/A
	Standard Error	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A
	Observations	N/A	N/A	N/A	N/A
	Pseudo R2	N/A	N/A	N/A	N/A
Narragansett	Coefficient	-0.034	-0.048	0.208	0.142
	Standard Error	(0.076)	(0.142)	(0.426)	(0.293)
	P-Value	0.653	0.731	0.625	0.628
	Q-Value	N/A	N/A	0.711	0.711
	Observations	966	916	990	1045
	Pseudo R2	0.037	0.041	0.090	0.054
Newport	Coefficient	0.104	-0.052	0.358	0.153
	Standard Error	(0.180)	(0.166)	(0.256)	(0.165)
	P-Value	0.563	0.753	0.160	0.351
	Q-Value	0.711	N/A	0.419	0.643
	Observations	977	928	881	1020
	Pseudo R2	0.056	0.074	0.043	0.050
North Kingstown	Coefficient	0.662++	N/A	N/A	N/A
	Standard Error	(0.305)	N/A	N/A	N/A
	P-Value	0.029	N/A	N/A	N/A
	Q-Value	0.136	N/A	N/A	N/A
	Observations	701	N/A	N/A	N/A
	Pseudo R2	0.162	N/A	N/A	N/A
North Providence	Coefficient	-0.228	-0.079	-0.009	-0.075
	Standard Error	(0.167)	(0.128)	(0.178)	(0.118)
	P-Value	0.174	0.537	0.953	0.523
	Q-Value	N/A	N/A	N/A	N/A
	Observations	862	842	820	968
	Pseudo R2	0.030	0.028	0.039	0.023
North Smithfield	Coefficient	N/A	N/A	N/A	N/A
	Standard Error	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A
	Observations	N/A	N/A	N/A	N/A
	Pseudo R2	N/A	N/A	N/A	N/A

Table C.10: Logistic Regression of Minority Status on Daylight by Department with Officer Fixed-Effects, All Moving Violations 2018

Department	Variable	Non-Caucasian	Black	Hispanic	Black or Hispanic
Pawtucket	Coefficient	0.330+	0.254	0.148	0.151
	Standard Error	(0.170)	(0.194)	(0.254)	(0.216)
	P-Value	0.052	0.190	0.561	0.481
	Q-Value	0.186	0.439	0.711	0.705
	Observations	1023	980	943	1233
	Pseudo R2	0.093	0.101	0.072	0.082
Portsmouth	Coefficient	0.354+	0.316	-0.035	0.185
	Standard Error	(0.196)	(0.248)	(0.344)	(0.210)
	P-Value	0.071	0.203	0.920	0.379
	Q-Value	0.216	0.439	N/A	0.643
	Observations	795	780	729	860
	Pseudo R2	0.039	0.035	0.043	0.043
Providence	Coefficient	0.237	0.250	0.335	0.310
	Standard Error	(0.001)	(0.001)	(0.001)	(0.001)
	P-Value	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A
	Observations	1465	1392	1495	2074
	Pseudo R2	0.012	0.013	0.010	0.009
Richmond	Coefficient	0.425	N/A	N/A	N/A
	Standard Error	(0.331)	N/A	N/A	N/A
	P-Value	0.200	N/A	N/A	N/A
	Q-Value	0.439	N/A	N/A	N/A
	Observations	557	N/A	N/A	N/A
	Pseudo R2	0.064	N/A	N/A	N/A
RISP - Hope Valley	Coefficient	0.361	0.583++	0.400	0.476++
	Standard Error	(0.263)	(0.289)	(0.246)	(0.238)
	P-Value	0.172	0.043	0.103	0.045
	Q-Value	0.430	0.175	0.280	0.175
	Observations	645	583	558	684
	Pseudo R2	0.079	0.085	0.067	0.059
RISP - HQ	Coefficient	N/A	N/A	N/A	N/A
	Standard Error	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A
	Observations	N/A	N/A	N/A	N/A
	Pseudo R2	N/A	N/A	N/A	N/A
RISP - Lincoln	Coefficient	-0.224	-0.310	-0.277	-0.259
	Standard Error	(0.152)	(0.207)	(0.206)	(0.165)
	P-Value	0.140	0.134	0.179	0.119
	Q-Value	N/A	N/A	N/A	N/A
	Observations	733	690	706	858
	Pseudo R2	0.050	0.059	0.034	0.037
RISP - Portsmouth	Coefficient	N/A	N/A	N/A	N/A
	Standard Error	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A
	Observations	N/A	N/A	N/A	N/A
	Pseudo R2	N/A	N/A	N/A	N/A

Table C.10: Logistic Regression of Minority Status on Daylight by Department with Officer Fixed-Effects, All Moving Violations 2018

Department	Variable	Non-Caucasian	Black	Hispanic	Black or Hispanic
RISP - Scituate	Coefficient	N/A	N/A	N/A	N/A
	Standard Error	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A
	Observations	N/A	N/A	N/A	N/A
	Pseudo R2	N/A	N/A	N/A	N/A
RISP - Wickford	Coefficient	0.202	0.143	0.064	0.125
	Standard Error	(0.256)	(0.266)	(0.241)	(0.214)
	P-Value	0.428	0.587	0.791	0.558
	Q-Value	0.661	0.711	0.818	0.711
	Observations	826	800	763	910
	Pseudo R2	0.052	0.052	0.045	0.035
Scituate	Coefficient	N/A	N/A	N/A	N/A
	Standard Error	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A
	Observations	N/A	N/A	N/A	N/A
	Pseudo R2	N/A	N/A	N/A	N/A
Smithfield	Coefficient	0.796***	0.837++	0.164	0.453***
	Standard Error	(0.272)	(0.382)	(0.411)	(0.133)
	P-Value	0.003	0.028	0.689	0.001
	Q-Value	0.023	0.136	0.765	0.001
	Observations	1096	1062	952	1117
	Pseudo R2	0.050	0.059	0.028	0.039
South Kingstown	Coefficient	0.208	0.045	0.558++	0.150
	Standard Error	(0.181)	(0.323)	(0.280)	(0.293)
	P-Value	0.252	0.888	0.046	0.609
	Q-Value	0.523	0.888	0.175	0.711
	Observations	1143	1035	880	1059
	Pseudo R2	0.075	0.068	0.083	0.054
Tiverton	Coefficient	N/A	N/A	N/A	N/A
	Standard Error	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A
	Observations	N/A	N/A	N/A	N/A
	Pseudo R2	N/A	N/A	N/A	N/A
Univ Of Rhode Island	Coefficient	N/A	N/A	N/A	N/A
	Standard Error	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A
	Observations	N/A	N/A	N/A	N/A
	Pseudo R2	N/A	N/A	N/A	N/A
Warren	Coefficient	-0.358++	-0.326	1.026+	-0.050
	Standard Error	(0.166)	(0.547)	(0.565)	(0.370)
	P-Value	0.032	0.550	0.070	0.893
	Q-Value	N/A	N/A	0.216	N/A
	Observations	738	700	683	718
	Pseudo R2	0.172	0.094	0.172	0.082

Table C.10: Logistic Regression of Minority Status on Daylight by Department with Officer Fixed-Effects, All Moving Violations 2018

Department	Variable	Non-Caucasian	Black	Hispanic	Black or Hispanic
Warwick	Coefficient	1.047***	0.551***	0.533***	0.527***
	Standard Error	(0.120)	(0.119)	(0.155)	(0.101)
	P-Value	0.001	0.001	0.001	0.001
	Q-Value	0.008	0.001	0.001	0.001
	Observations	2620	2227	2144	2476
	Pseudo R2	0.103	0.064	0.067	0.061
West Greenwich	Coefficient	N/A	N/A	N/A	N/A
	Standard Error	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A
	Observations	N/A	N/A	N/A	N/A
	Pseudo R2	N/A	N/A	N/A	N/A
West Warwick	Coefficient	0.462	-0.104	-0.358	-0.305
	Standard Error	(0.365)	(0.162)	(0.321)	(0.234)
	P-Value	0.204	0.522	0.263	0.194
	Q-Value	0.439	N/A	N/A	N/A
	Observations	1385	1082	1092	1153
	Pseudo R2	0.172	0.048	0.064	0.039
Westerly	Coefficient	-0.116	0.093	0.922++	0.270
	Standard Error	(0.167)	(0.263)	(0.398)	(0.289)
	P-Value	0.486	0.722	0.019	0.351
	Q-Value	N/A	0.774	0.111	0.643
	Observations	749	631	566	743
	Pseudo R2	0.098	0.085	0.089	0.072
Woonsocket	Coefficient	0.368***	0.190	-0.119	-0.061
	Standard Error	(0.071)	(0.333)	(0.210)	(0.201)
	P-Value	0.001	0.565	0.570	0.757
	Q-Value	0.001	0.711	N/A	N/A
	Observations	1076	794	857	961
	Pseudo R2	0.054	0.035	0.041	0.032

APPENDIX D: SYNTHETIC CONTROL ANALYSIS DATA TABLES

Table D.1: Inverse Propensity Score Weighted Logistic Regression of Minority Status on Department, All Traffic Stops 2018

Department	Variable	Non-Caucasian	Black	Hispanic	Black or Hispanic
Barrington	Coefficient	0.001	0.001	0.001	0.001
	Standard Error	(0.001)	(0.001)	(0.001)	(0.001)
	P-Value	1	1	1	1
	Q-Value	1	1	1	1
	Observations	3573	3573	3573	3573
	Pseudo R2	N/A	N/A	N/A	N/A
Bristol	Coefficient	-0.017	-0.046	-0.039+++	-0.079
	Standard Error	(0.001)	(0.030)	(0.008)	(0.001)
	P-Value	N/A	0.142	0	N/A
	Q-Value	N/A	N/A	0.001	N/A
	Observations	36417	36417	36417	36417
	Pseudo R2	N/A	N/A	N/A	N/A
Burrillville	Coefficient	-0.041	-0.025	-0.006	-0.029
	Standard Error	(0.001)	(0.021)	(0.007)	(0.035)
	P-Value	N/A	0.254	0.439	0.409
	Q-Value	N/A	N/A	N/A	N/A
	Observations	101950	101950	101950	101950
	Pseudo R2	N/A	N/A	N/A	N/A
Central Falls	Coefficient	0.001	0.001	0.001	0.001
	Standard Error	(0.001)	(0.001)	(0.001)	(0.001)
	P-Value	1	1	1	1
	Q-Value	1	1	1	1
	Observations	4911	4911	4911	4911
	Pseudo R2	N/A	N/A	N/A	N/A
Charlestown	Coefficient	-0.112+++	-0.068	-0.070	-0.128
	Standard Error	(0.029)	(0.001)	(0.001)	(0.001)
	P-Value	0	N/A	N/A	N/A
	Q-Value	0.001	N/A	N/A	N/A
	Observations	176044	176044	176044	176044
	Pseudo R2	N/A	N/A	N/A	N/A
Coventry	Coefficient	-0.165+++	-0.142	-0.065	-0.192
	Standard Error	(0.063)	(0.001)	(0.001)	(0.001)
	P-Value	0.008	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A
	Observations	97572	97572	97572	97572
	Pseudo R2	N/A	N/A	N/A	N/A
Cranston	Coefficient	-0.024	-0.028	0.050	0.012
	Standard Error	(0.001)	(0.001)	(0.001)	(0.001)
	P-Value	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A
	Observations	113474	113474	113474	113474
	Pseudo R2	N/A	N/A	N/A	N/A
Cumberland	Coefficient	-0.008	0.017***	0.070***	0.082***
	Standard Error	(0.004)	(0.004)	(0.004)	(0.006)
	P-Value	0.104	0.001	0.001	0.001
	Q-Value	N/A	0.001	0.004	0.004
	Observations	197413	197413	197413	197413
	Pseudo R2	N/A	N/A	N/A	N/A

Table D.1: Inverse Propensity Score Weighted Logistic Regression of Minority Status on Department, All Traffic Stops 2018

Department	Variable	Non-Caucasian	Black	Hispanic	Black or Hispanic
East Greenwich	Coefficient	-0.082+++	-0.074+++	-0.108+++	-0.175+++
	Standard Error	(0.012)	(0.004)	(0.004)	(0.006)
	P-Value	0	0.001	0.001	0.001
	Q-Value	0.001	N/A	N/A	N/A
	Observations	55143	55143	55143	55143
	Pseudo R2	N/A	N/A	N/A	N/A
East Providence	Coefficient	0.001	0.001	0.001	0.001
	Standard Error	(0.001)	(0.001)	(0.001)	(0.001)
	P-Value	1	1	1	1
	Q-Value	1	1	1	1
	Observations	13179	13179	13179	13179
	Pseudo R2	N/A	N/A	N/A	N/A
Foster	Coefficient	0.063***	0.029	0.035***	0.065***
	Standard Error	(0.008)	(0.001)	(0.007)	(0.013)
	P-Value	0.001	N/A	0.001	0.001
	Q-Value	0.001	N/A	0.001	0.001
	Observations	21974	21974	21974	21974
	Pseudo R2	N/A	N/A	N/A	N/A
Glocester	Coefficient	-0.082+	-0.028	-0.032+++	-0.057
	Standard Error	(0.046)	(0.001)	(0.009)	(0.001)
	P-Value	0.078	N/A	0.002	N/A
	Q-Value	N/A	N/A	N/A	N/A
	Observations	72375	72375	72375	72375
	Pseudo R2	N/A	N/A	N/A	N/A
Hopkinton	Coefficient	0.071***	0.041	0.026**	0.063***
	Standard Error	(0.019)	(0.001)	(0.010)	(0.016)
	P-Value	0	N/A	0.018	0.001
	Q-Value	0.001	N/A	0.070	0.001
	Observations	29900	29900	29900	29900
	Pseudo R2	N/A	N/A	N/A	N/A
Jamestown	Coefficient	0.001	0.001	0.001	0.001
	Standard Error	(0.001)	(0.001)	(0.001)	(0.001)
	P-Value	1	1	1	1
	Q-Value	1	1	1	1
	Observations	1657	1657	1657	1657
	Pseudo R2	N/A	N/A	N/A	N/A
Johnston	Coefficient	-0.052	-0.028	0.041	0.017
	Standard Error	(0.001)	(0.001)	(0.335)	(0.001)
	P-Value	N/A	N/A	0.902	N/A
	Q-Value	N/A	N/A	1	N/A
	Observations	90554	90554	90554	90554
	Pseudo R2	N/A	N/A	N/A	N/A
Lincoln	Coefficient	0.028***	0.027***	0.103***	0.116***
	Standard Error	(0.008)	(0.007)	(0.008)	(0.009)
	P-Value	0	0	0.001	0.001
	Q-Value	0.001	0.001	0.004	0.004
	Observations	197413	197413	197413	197413
	Pseudo R2	N/A	N/A	N/A	N/A

Table D.1: Inverse Propensity Score Weighted Logistic Regression of Minority Status on Department, All Traffic Stops 2018

Department	Variable	Non-Caucasian	Black	Hispanic	Black or Hispanic
Little Compton	Coefficient	0.001	0.001	0.001	0.001
	Standard Error	(0.001)	(0.001)	(0.001)	(0.001)
	P-Value	1	1	1	1
	Q-Value	1	1	1	1
	Observations	1303	1303	1303	1303
	Pseudo R2	N/A	N/A	N/A	N/A
Middletown	Coefficient	0.027***	0.043***	-0.037+++	0.009+
	Standard Error	(0.006)	(0.004)	(0.004)	(0.006)
	P-Value	0.001	0.001	0.001	0.098
	Q-Value	0.001	0.001	N/A	0.324
	Observations	197413	197413	197413	197413
	Pseudo R2	N/A	N/A	N/A	N/A
Narragansett	Coefficient	-0.008	0.014	0.004	0.019
	Standard Error	(0.001)	(0.001)	(0.001)	(0.351)
	P-Value	N/A	N/A	N/A	0.953
	Q-Value	N/A	N/A	N/A	1
	Observations	142206	142206	142206	142206
	Pseudo R2	N/A	N/A	N/A	N/A
Newport	Coefficient	0.001	0.001	0.001	0.001
	Standard Error	(0.001)	(0.001)	(0.001)	(0.001)
	P-Value	1	1	1	1
	Q-Value	1	1	1	1
	Observations	6492	6492	6492	6492
	Pseudo R2	N/A	N/A	N/A	N/A
North Kingstown	Coefficient	0.061	-0.086	-0.120	-0.174
	Standard Error	(0.001)	(0.001)	(0.133)	(0.146)
	P-Value	N/A	N/A	0.360	0.236
	Q-Value	N/A	N/A	N/A	N/A
	Observations	96383	96383	96383	96383
	Pseudo R2	N/A	N/A	N/A	N/A
North Providence	Coefficient	0.001	0.001	0.001	0.001
	Standard Error	(0.001)	(0.001)	(0.001)	(0.001)
	P-Value	1	1	1	1
	Q-Value	1	1	1	1
	Observations	5358	5358	5358	5358
	Pseudo R2	N/A	N/A	N/A	N/A
North Smithfield	Coefficient	0.215***	0.180***	0.148***	0.277***
	Standard Error	(0.009)	(0.008)	(0.043)	(0.041)
	P-Value	0.001	0.001	0.001	0.001
	Q-Value	0.004	0.004	0.001	0.001
	Observations	186666	186666	186666	186666
	Pseudo R2	N/A	N/A	N/A	N/A
Pawtucket	Coefficient	0.001	0.001	0.001	0.001
	Standard Error	(0.001)	(0.001)	(0.001)	(0.001)
	P-Value	1	1	1	1
	Q-Value	1	1	1	1
	Observations	10833	10833	10833	10833
	Pseudo R2	N/A	N/A	N/A	N/A

Table D.1: Inverse Propensity Score Weighted Logistic Regression of Minority Status on Department, All Traffic Stops 2018

Department	Variable	Non-Caucasian	Black	Hispanic	Black or Hispanic
Portsmouth	Coefficient	0.012	0.037+	-0.024	0.010
	Standard Error	(0.027)	(0.020)	(0.028)	(0.034)
	P-Value	0.660	0.072	0.405	0.751
	Q-Value	1	0.250	N/A	1
	Observations	192156	192156	192156	192156
	Pseudo R2	N/A	N/A	N/A	N/A
Providence	Coefficient	0.001	0.001	0.001	0.001
	Standard Error	(0.001)	(0.001)	(0.001)	(0.001)
	P-Value	1	1	1	1
	Q-Value	1	1	1	1
	Observations	13146	13146	13146	13146
	Pseudo R2	N/A	N/A	N/A	N/A
Richmond	Coefficient	0.001	0.001	0.001	0.001
	Standard Error	(0.001)	(0.001)	(0.001)	(0.001)
	P-Value	1	1	1	1
	Q-Value	1	1	1	1
	Observations	1741	1741	1741	1741
	Pseudo R2	N/A	N/A	N/A	N/A
Scituate	Coefficient	-0.086+++	-0.039	-0.026	-0.059
	Standard Error	(0.019)	(0.001)	(0.045)	(0.057)
	P-Value	0	N/A	0.555	0.291
	Q-Value	0.001	N/A	N/A	N/A
	Observations	106461	106461	106461	106461
	Pseudo R2	N/A	N/A	N/A	N/A
Smithfield	Coefficient	-0.027	-0.020	0.012	-0.008
	Standard Error	(0.032)	(0.001)	(0.001)	(0.006)
	P-Value	0.400	N/A	N/A	0.155
	Q-Value	N/A	N/A	N/A	N/A
	Observations	30895	30895	30895	30895
	Pseudo R2	N/A	N/A	N/A	N/A
South Kingstown	Coefficient	0.001	0.001	0.001	0.001
	Standard Error	(0.001)	(0.001)	(0.001)	(0.001)
	P-Value	1	1	1	1
	Q-Value	1	1	1	1
	Observations	6172	6172	6172	6172
	Pseudo R2	N/A	N/A	N/A	N/A
Tiverton	Coefficient	-0.128	-0.105	-0.056	-0.144
	Standard Error	(0.001)	(0.001)	(0.001)	(0.001)
	P-Value	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A
	Observations	80697	80697	80697	80697
	Pseudo R2	N/A	N/A	N/A	N/A
Warren	Coefficient	-0.046	-0.054	-0.173+++	-0.208++
	Standard Error	(0.112)	(0.001)	(0.059)	(0.082)
	P-Value	0.681	N/A	0.003	0.010
	Q-Value	N/A	N/A	N/A	N/A
	Observations	93633	93633	93633	93633
	Pseudo R2	N/A	N/A	N/A	N/A

Table D.1: Inverse Propensity Score Weighted Logistic Regression of Minority Status on Department, All Traffic Stops 2018

Department	Variable	Non-Caucasian	Black	Hispanic	Black or Hispanic
Warwick	Coefficient	0.016	-0.043	-0.070	-0.093+
	Standard Error	(0.001)	(0.037)	(0.001)	(0.048)
	P-Value	N/A	0.244	N/A	0.054
	Q-Value	N/A	N/A	N/A	N/A
	Observations	171824	171824	171824	171824
	Pseudo R2	N/A	N/A	N/A	N/A
West Greenwich	Coefficient	-0.032	-0.017	-0.007	-0.018
	Standard Error	(0.001)	(0.001)	(0.018)	(0.001)
	P-Value	N/A	N/A	0.717	N/A
	Q-Value	N/A	N/A	N/A	N/A
	Observations	57136	57136	57136	57136
	Pseudo R2	N/A	N/A	N/A	N/A
West Warwick	Coefficient	0	-0.112	-0.093	-0.187
	Standard Error	(0.136)	(0.001)	(0.001)	(0.001)
	P-Value	0.998	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A
	Observations	61813	61813	61813	61813
	Pseudo R2	N/A	N/A	N/A	N/A
Westerly	Coefficient	-0.128	-0.096	-0.100	-0.172
	Standard Error	(0.001)	(0.001)	(0.001)	(0.001)
	P-Value	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A
	Observations	120617	120617	120617	120617
	Pseudo R2	N/A	N/A	N/A	N/A
Woonsocket	Coefficient	0.180	-0.035	-0.050	-0.070
	Standard Error	(0.001)	(0.001)	(0.001)	(2.809)
	P-Value	N/A	N/A	N/A	0.980
	Q-Value	N/A	N/A	N/A	N/A
	Observations	52971	52971	52971	52971
	Pseudo R2	N/A	N/A	N/A	N/A

Table D.2: Doubly-Robust Inverse Propensity Score Weighted Logistic Regression of Minority Status on Department, All Traffic Stops 2018

Department	Variable	Non-Caucasian	Black	Hispanic	Black or Hispanic
Barrington	Coefficient	0.001	0.001	0.001	0.001
	Standard Error	(0.001)	(0.001)	(0.001)	(0.001)
	P-Value	1	1	1	1
	Q-Value	1	1	1	1
	Observations	3573	3573	3573	3573
	Pseudo R2	N/A	N/A	N/A	N/A
Bristol	Coefficient	-0.001	-0.037	-0.045	-0.078
	Standard Error	(0.001)	(0.001)	(0.001)	(0.001)
	P-Value	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A
	Observations	36417	36417	36417	36417
	Pseudo R2	N/A	N/A	N/A	N/A
Burrillville	Coefficient	0.446	0.224	0.287	0.519
	Standard Error	N/A	(0.001)	(0.001)	(0.001)
	P-Value	0.998	N/A	N/A	N/A
	Q-Value	1	N/A	N/A	N/A
	Observations	101950	101950	101950	101950
	Pseudo R2	N/A	N/A	N/A	N/A
Central Falls	Coefficient	0.001	0.001	0.001	0.001
	Standard Error	(0.001)	(0.001)	(0.001)	(0.001)
	P-Value	1	1	1	1
	Q-Value	1	1	1	1
	Observations	4911	4911	4911	4911
	Pseudo R2	N/A	N/A	N/A	N/A
Charlestown	Coefficient	0.171	0.023	0.046	0.067
	Standard Error	N/A	(0.001)	N/A	N/A
	P-Value	1	N/A	1	1
	Q-Value	1	N/A	1	1
	Observations	176044	176044	176044	176044
	Pseudo R2	N/A	N/A	N/A	N/A
Coventry	Coefficient	-0.043	-0.034	-0.018	-0.050
	Standard Error	(0.001)	(0.001)	(0.001)	(0.001)
	P-Value	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A
	Observations	97572	97572	97572	97572
	Pseudo R2	N/A	N/A	N/A	N/A
Cranston	Coefficient	-0.125	-0.131	-0.116	-0.252
	Standard Error	N/A	N/A	(0.001)	N/A
	P-Value	1	1	N/A	1
	Q-Value	N/A	N/A	N/A	N/A
	Observations	113474	113474	113474	113474
	Pseudo R2	N/A	N/A	N/A	N/A
Cumberland	Coefficient	-0.016+++	0.012***	0.063***	0.070***
	Standard Error	(0.004)	(0.004)	(0.004)	(0.006)
	P-Value	0.001	0.004	0.001	0.001
	Q-Value	0.001	0.020	0.006	0.006
	Observations	197413	197413	197413	197413
	Pseudo R2	N/A	N/A	N/A	N/A

Table D.2: Doubly-Robust Inverse Propensity Score Weighted Logistic Regression of Minority Status on Department, All Traffic Stops 2018

Department	Variable	Non-Caucasian	Black	Hispanic	Black or Hispanic
East Greenwich	Coefficient	0.086	0.020	0.052	0.046
	Standard Error	(0.001)	(0.001)	(0.001)	(0.001)
	P-Value	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A
	Observations	55143	55143	55143	55143
	Pseudo R2	N/A	N/A	N/A	N/A
East Providence	Coefficient	0.001	0.001	0.001	0.001
	Standard Error	(0.001)	(0.001)	(0.001)	(0.001)
	P-Value	1	1	1	1
	Q-Value	1	1	1	1
	Observations	13179	13179	13179	13179
	Pseudo R2	N/A	N/A	N/A	N/A
Foster	Coefficient	0.148	0.086	0.090	0.172
	Standard Error	(0.001)	(0.001)	(0.001)	(0.001)
	P-Value	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A
	Observations	21974	21974	21974	21974
	Pseudo R2	N/A	N/A	N/A	N/A
Glocester	Coefficient	-0.611	-0.296	-0.043	-0.333
	Standard Error	N/A	N/A	N/A	N/A
	P-Value	1	1	1	1
	Q-Value	N/A	N/A	N/A	N/A
	Observations	72375	72375	72375	72375
	Pseudo R2	N/A	N/A	N/A	N/A
Hopkinton	Coefficient	0.096	0.056**	0.032	0.082
	Standard Error	(0.001)	(0.023)	(0.057)	(0.103)
	P-Value	N/A	0.017	0.556	0.419
	Q-Value	N/A	0.086	1	1
	Observations	29900	29900	29900	29900
	Pseudo R2	N/A	N/A	N/A	N/A
Jamestown	Coefficient	0.001	0.001	0.001	0.001
	Standard Error	(0.001)	(0.001)	(0.001)	(0.001)
	P-Value	1	1	1	1
	Q-Value	1	1	1	1
	Observations	1657	1657	1657	1657
	Pseudo R2	N/A	N/A	N/A	N/A
Johnston	Coefficient	-0.127	0.284	0.020	0.291
	Standard Error	(0.001)	(0.001)	(0.001)	N/A
	P-Value	N/A	N/A	N/A	1
	Q-Value	N/A	N/A	N/A	1
	Observations	90554	90554	90554	90554
	Pseudo R2	N/A	N/A	N/A	N/A
Lincoln	Coefficient	0.027***	0.026***	0.103***	0.115***
	Standard Error	(0.008)	(0.007)	(0.008)	(0.009)
	P-Value	0.001	0	0.001	0.001
	Q-Value	0.001	0.001	0.006	0.006
	Observations	197413	197413	197413	197413
	Pseudo R2	N/A	N/A	N/A	N/A

Table D.2: Doubly-Robust Inverse Propensity Score Weighted Logistic Regression of Minority Status on Department, All Traffic Stops 2018

Department	Variable	Non-Caucasian	Black	Hispanic	Black or Hispanic
Little Compton	Coefficient	0.001	0.001	0.001	0.001
	Standard Error	(0.001)	(0.001)	(0.001)	(0.001)
	P-Value	1	1	1	1
	Q-Value	1	1	1	1
	Observations	1303	1303	1303	1303
	Pseudo R2	N/A	N/A	N/A	N/A
Middletown	Coefficient	0.021***	0.039***	-0.041+++	0.004
	Standard Error	(0.006)	(0.004)	(0.004)	(0.006)
	P-Value	0	0.001	0.001	0.432
	Q-Value	0.001	0.001	N/A	1
	Observations	197413	197413	197413	197413
	Pseudo R2	N/A	N/A	N/A	N/A
Narragansett	Coefficient	0.052	-0.017	0.057	0.028
	Standard Error	(0.001)	N/A	(0.001)	N/A
	P-Value	N/A	1	N/A	1
	Q-Value	N/A	N/A	N/A	1
	Observations	142206	142206	142206	142206
	Pseudo R2	N/A	N/A	N/A	N/A
Newport	Coefficient	0.001	0.001	0.001	0.001
	Standard Error	(0.001)	(0.001)	(0.001)	(0.001)
	P-Value	1	1	1	1
	Q-Value	1	1	1	1
	Observations	6492	6492	6492	6492
	Pseudo R2	N/A	N/A	N/A	N/A
North Kingstown	Coefficient	0.155	-0.016	-0.039	-0.025
	Standard Error	N/A	N/A	(0.001)	N/A
	P-Value	1	1	N/A	1
	Q-Value	1	N/A	N/A	N/A
	Observations	96383	96383	96383	96383
	Pseudo R2	N/A	N/A	N/A	N/A
North Providence	Coefficient	0.001	0.001	0.001	0.001
	Standard Error	(0.001)	(0.001)	(0.001)	(0.001)
	P-Value	1	1	1	1
	Q-Value	1	1	1	1
	Observations	5358	5358	5358	5358
	Pseudo R2	N/A	N/A	N/A	N/A
North Smithfield	Coefficient	0.195***	0.168***	0.165***	0.284***
	Standard Error	(0.009)	(0.008)	(0.017)	(0.017)
	P-Value	0.001	0.001	0.001	0.001
	Q-Value	0.006	0.006	0.006	0.006
	Observations	186666	186666	186666	186666
	Pseudo R2	N/A	N/A	N/A	N/A
Pawtucket	Coefficient	0.001	0.001	0.001	0.001
	Standard Error	(0.001)	(0.001)	(0.001)	(0.001)
	P-Value	1	1	1	1
	Q-Value	1	1	1	1
	Observations	10833	10833	10833	10833
	Pseudo R2	N/A	N/A	N/A	N/A

Table D.2: Doubly-Robust Inverse Propensity Score Weighted Logistic Regression of Minority Status on Department, All Traffic Stops 2018

Department	Variable	Non-Caucasian	Black	Hispanic	Black or Hispanic
Portsmouth	Coefficient	0.014	0.030**	-0.016	0.016
	Standard Error	(0.017)	(0.013)	(0.017)	(0.019)
	P-Value	0.414	0.017	0.374	0.426
	Q-Value	1	0.086	N/A	1
	Observations	192156	192156	192156	192156
	Pseudo R2	N/A	N/A	N/A	N/A
Providence	Coefficient	N/A	N/A	N/A	N/A
	Standard Error	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A
	Observations	N/A	N/A	N/A	N/A
	Pseudo R2	N/A	N/A	N/A	N/A
Richmond	Coefficient	0.001	0.001	0.001	0.001
	Standard Error	(0.001)	(0.001)	(0.001)	(0.001)
	P-Value	1	1	1	1
	Q-Value	1	1	1	1
	Observations	1741	1741	1741	1741
	Pseudo R2	N/A	N/A	N/A	N/A
Scituate	Coefficient	-0.577	-0.460	-0.354	-0.721
	Standard Error	(0.001)	(0.001)	(0.001)	N/A
	P-Value	N/A	N/A	N/A	1
	Q-Value	N/A	N/A	N/A	N/A
	Observations	106461	106461	106461	106461
	Pseudo R2	N/A	N/A	N/A	N/A
Smithfield	Coefficient	0.013	0.008	0.028	0.032
	Standard Error	(0.001)	(1.082)	(0.160)	(0.001)
	P-Value	N/A	0.992	0.861	N/A
	Q-Value	N/A	1	1	N/A
	Observations	30895	30895	30895	30895
	Pseudo R2	N/A	N/A	N/A	N/A
South Kingstown	Coefficient	0.001	0.001	0.001	0.001
	Standard Error	(0.001)	(0.001)	(0.001)	(0.001)
	P-Value	1	1	1	1
	Q-Value	1	1	1	1
	Observations	6172	6172	6172	6172
	Pseudo R2	N/A	N/A	N/A	N/A
Tiverton	Coefficient	0.004	0.004	-0.030	-0.023
	Standard Error	N/A	N/A	N/A	N/A
	P-Value	1	1	1	1
	Q-Value	1	1	N/A	N/A
	Observations	80697	80697	80697	80697
	Pseudo R2	N/A	N/A	N/A	N/A
Warren	Coefficient	0.257	0.120	0.141	0.246
	Standard Error	N/A	(0.001)	N/A	(0.001)
	P-Value	0.999	N/A	1	N/A
	Q-Value	1	N/A	1	N/A
	Observations	93633	93633	93633	93633
	Pseudo R2	N/A	N/A	N/A	N/A

Table D.2: Doubly-Robust Inverse Propensity Score Weighted Logistic Regression of Minority Status on Department, All Traffic Stops 2018

Department	Variable	Non-Caucasian	Black	Hispanic	Black or Hispanic
Warwick	Coefficient	0.391	0.014	-0.456	-0.244
	Standard Error	(0.001)	N/A	N/A	(0.001)
	P-Value	N/A	1	0.999	N/A
	Q-Value	N/A	1	N/A	N/A
	Observations	171824	171824	171824	171824
	Pseudo R2	N/A	N/A	N/A	N/A
West Greenwich	Coefficient	-1.652	-0.568	-1.223	-1.521
	Standard Error	(0.001)	N/A	N/A	N/A
	P-Value	N/A	1	1	1
	Q-Value	N/A	N/A	N/A	N/A
	Observations	57136	57136	57136	57136
	Pseudo R2	N/A	N/A	N/A	N/A
West Warwick	Coefficient	-0.573	-0.393	0.046	-0.312
	Standard Error	N/A	N/A	N/A	N/A
	P-Value	1	1	1	1
	Q-Value	N/A	N/A	1	N/A
	Observations	61813	61813	61813	61813
	Pseudo R2	N/A	N/A	N/A	N/A
Westerly	Coefficient	-0.032	-0.007	-0.004	-0.009
	Standard Error	(0.168)	(0.001)	(0.136)	(0.197)
	P-Value	0.851	N/A	0.977	0.958
	Q-Value	N/A	N/A	N/A	N/A
	Observations	120617	120617	120617	120617
	Pseudo R2	N/A	N/A	N/A	N/A
Woonsocket	Coefficient	0.546	-0.004	-0.463	-0.458
	Standard Error	(0.001)	(0.001)	N/A	N/A
	P-Value	N/A	N/A	1	1
	Q-Value	N/A	N/A	N/A	N/A
	Observations	52971	52971	52971	52971
	Pseudo R2	N/A	N/A	N/A	N/A

APPENDIX E: DESCRIPTIVE STATISTICS DATA TABLES

Table E.1: Statewide Average Comparisons for Minority Motorists, All Departments 2018

Department Name	Minority Stops	Difference Between Town and State Average	Minority Residents Age 16+	Difference Between Town and State Average	Difference Between Net Differences
Barrington	13.1%	-17.4%	4.8%	-15.6%	-1.8%
Bristol	8.0%	-22.5%	4.2%	-16.2%	-6.3%
Burrillville	7.6%	-22.9%	2.0%	-18.4%	-4.5%
Central Falls	64.8%	34.3%	69.8%	49.4%	-15.1%
Charlestown	8.3%	-22.2%	4.0%	-16.4%	-5.8%
Coventry	7.3%	-23.2%	3.4%	-17.0%	-6.2%
Cranston	41.9%	11.4%	20.3%	-0.1%	11.5%
Cumberland	21.9%	-8.6%	8.3%	-12.1%	3.5%
East Greenwich	9.7%	-20.8%	6.5%	-13.9%	-6.9%
East Providence	34.8%	4.3%	15.6%	-4.8%	9.1%
Foster	18.0%	-12.5%	0.0%	-20.4%	7.9%
Glocester	9.7%	-20.8%	1.0%	-19.4%	-1.4%
Hopkinton	18.1%	-12.4%	2.5%	-17.9%	5.5%
Jamestown	10.3%	-20.2%	0.0%	-20.4%	0.2%
Johnston	27.8%	-2.7%	8.9%	-11.5%	8.8%
Lincoln	26.4%	-4.1%	8.2%	-12.2%	8.1%
Little Compton	6.5%	-24.0%	0.0%	-20.4%	-3.6%
Middletown	20.7%	-9.8%	12.5%	-7.9%	-1.9%
Narragansett	12.2%	-18.3%	4.3%	-16.1%	-2.2%
Newport	23.7%	-6.8%	18.1%	-2.3%	-4.5%
North Kingstown	13.5%	-17.0%	5.5%	-14.9%	-2.1%
North Providence	38.0%	7.5%	14.4%	-6.0%	13.5%
North Smithfield	42.3%	11.8%	3.5%	-16.9%	28.7%
Pawtucket	50.6%	20.1%	38.7%	18.3%	1.8%
Portsmouth	17.9%	-12.6%	5.5%	-14.9%	2.3%
Providence	78.2%	47.7%	56.9%	36.5%	11.2%
Richmond	8.7%	-21.8%	2.7%	-17.7%	-4.1%
Scituate	8.3%	-22.2%	0.9%	-19.5%	-2.7%
Smithfield	15.9%	-14.6%	5.1%	-15.3%	0.7%
South Kingstown	13.9%	-16.6%	10.1%	-10.3%	-6.3%
Tiverton	12.4%	-18.1%	3.2%	-17.2%	-0.9%
Warren	10.9%	-19.6%	3.2%	-17.2%	-2.4%
Warwick	20.4%	-10.1%	7.8%	-12.6%	2.5%
West Greenwich	7.2%	-23.3%	1.8%	-18.6%	-4.7%
West Warwick	13.3%	-17.2%	9.2%	-11.2%	-6.0%
Westerly	10.9%	-19.6%	7.0%	-13.4%	-6.2%
Woonsocket	36.5%	6.0%	23.3%	2.9%	3.1%

Table E.2: Statewide Average Comparisons for Black Motorists, All Departments 2018

Department Name	Black Stops	Difference Between Town and State Average	Black Residents Age 16+	Difference Between Town and State Average	Difference Between Net Differences
Barrington	5.7%	-7.2%	0.00%	-4.5%	-2.7%
Bristol	3.9%	-9.0%	0.70%	-3.8%	-5.2%
Burrillville	3.1%	-9.8%	0.00%	-4.5%	-5.3%
Central Falls	16.9%	4.0%	6.80%	2.3%	1.7%
Charlestown	4.0%	-8.9%	0.00%	-4.5%	-4.4%
Coventry	3.2%	-9.7%	0.50%	-4.0%	-5.7%
Cranston	14.4%	1.5%	4.60%	0.1%	1.4%
Cumberland	7.1%	-5.8%	1.10%	-3.4%	-2.4%
East Greenwich	3.6%	-9.3%	0.80%	-3.7%	-5.6%
East Providence	20.7%	7.8%	5.20%	0.7%	7.1%
Foster	6.8%	-6.1%	0.00%	-4.5%	-1.6%
Glocester	4.7%	-8.2%	0.00%	-4.5%	-3.7%
Hopkinton	8.2%	-4.7%	0.00%	-4.5%	-0.2%
Jamestown	4.2%	-8.7%	0.00%	-4.5%	-4.2%
Johnston	10.3%	-2.6%	1.60%	-2.9%	0.3%
Lincoln	7.9%	-5.0%	1.30%	-3.2%	-1.8%
Little Compton	2.7%	-10.2%	0.00%	-4.5%	-5.7%
Middletown	11.8%	-1.1%	4.20%	-0.3%	-0.8%
Narragansett	6.2%	-6.7%	0.70%	-3.8%	-2.9%
Newport	12.8%	-0.1%	6.10%	1.6%	-1.7%
North Kingstown	6.7%	-6.2%	0.80%	-3.7%	-2.5%
North Providence	18.5%	5.6%	3.90%	-0.6%	6.2%
North Smithfield	16.1%	3.2%	0.00%	-4.5%	7.7%
Pawtucket	23.7%	10.8%	11.10%	6.6%	4.2%
Portsmouth	9.7%	-3.2%	1.30%	-3.2%	0.0%
Providence	31.2%	18.3%	12.40%	7.9%	10.4%
Richmond	4.0%	-8.9%	0.00%	-4.5%	-4.4%
Scituate	3.2%	-9.7%	0.00%	-4.5%	-5.2%
Smithfield	6.7%	-6.2%	1.20%	-3.3%	-2.9%
South Kingstown	7.1%	-5.8%	2.10%	-2.4%	-3.4%
Tiverton	6.3%	-6.6%	0.80%	-3.7%	-2.9%
Warren	6.4%	-6.5%	0.90%	-3.6%	-2.9%
Warwick	9.1%	-3.8%	1.40%	-3.1%	-0.7%
West Greenwich	3.3%	-9.6%	0.00%	-4.5%	-5.1%
West Warwick	5.9%	-7.0%	1.90%	-2.6%	-4.4%
Westerly	5.0%	-7.9%	0.80%	-3.7%	-4.2%
Woonsocket	12.7%	-0.2%	4.90%	0.4%	-0.6%

Table E.3: Statewide Average Comparisons for Hispanic Motorists, All Departments 2018

Department Name	Hispanic Stops	Difference Between Town and State Average	Hispanic Residents Age 16+	Difference Between Town and State Average	Difference Between Net Differences
Barrington	4.4%	-10.9%	1.6%	-8.9%	-2.0%
Bristol	2.9%	-12.4%	1.7%	-8.8%	-3.6%
Burrillville	3.9%	-11.4%	1.3%	-9.2%	-2.2%
Central Falls	47.6%	32.3%	57.6%	47.1%	-14.8%
Charlestown	1.9%	-13.4%	1.3%	-9.2%	-4.2%
Coventry	3.4%	-11.9%	1.4%	-9.1%	-2.8%
Cranston	23.5%	8.2%	9.2%	-1.3%	9.5%
Cumberland	13.0%	-2.3%	3.8%	-6.7%	4.4%
East Greenwich	4.2%	-11.1%	1.3%	-9.2%	-1.9%
East Providence	12.4%	-2.9%	3.1%	-7.4%	4.5%
Foster	7.1%	-8.2%	0.0%	-10.5%	2.3%
Glocester	3.9%	-11.4%	1.0%	-9.5%	-1.9%
Hopkinton	6.5%	-8.8%	1.6%	-8.9%	0.1%
Jamestown	3.9%	-11.4%	0.0%	-10.5%	-0.9%
Johnston	15.2%	-0.1%	4.6%	-5.9%	5.8%
Lincoln	16.0%	0.7%	3.3%	-7.2%	7.9%
Little Compton	3.2%	-12.1%	0.0%	-10.5%	-1.6%
Middletown	7.2%	-8.1%	3.9%	-6.6%	-1.5%
Narragansett	4.5%	-10.8%	1.4%	-9.1%	-1.7%
Newport	9.1%	-6.2%	6.8%	-3.7%	-2.5%
North Kingstown	5.1%	-10.2%	1.8%	-8.7%	-1.5%
North Providence	18.4%	3.1%	6.5%	-4.0%	7.1%
North Smithfield	23.4%	8.1%	1.8%	-8.7%	16.8%
Pawtucket	25.8%	10.5%	17.4%	6.9%	3.6%
Portsmouth	6.5%	-8.8%	1.7%	-8.8%	0.0%
Providence	44.2%	28.9%	33.5%	23.0%	5.9%
Richmond	2.0%	-13.3%	1.5%	-9.0%	-4.3%
Scituate	3.5%	-11.8%	0.9%	-9.6%	-2.2%
Smithfield	7.7%	-7.6%	2.0%	-8.5%	0.9%
South Kingstown	4.0%	-11.3%	2.7%	-7.8%	-3.5%
Tiverton	5.1%	-10.2%	0.8%	-9.7%	-0.5%
Warren	3.6%	-11.7%	1.4%	-9.1%	-2.6%
Warwick	9.4%	-5.9%	2.8%	-7.7%	1.8%
West Greenwich	3.1%	-12.2%	1.8%	-8.7%	-3.5%
West Warwick	6.2%	-9.1%	3.8%	-6.7%	-2.4%
Westerly	3.4%	-11.9%	2.2%	-8.3%	-3.6%
Woonsocket	20.5%	5.2%	10.7%	0.2%	5.0%

Table E.4: Ratio of Minority EDP to Minority Stops, All Departments 2018

Department Name	Number of Stops	% Minority Stops	% Minority EDP	Absolute Difference	Ratio
Barrington	1,031	12.3%	6.5%	5.8%	1.90
Bristol	1,624	5.6%	6.6%	-1.0%	0.85
Burrillville	1,410	7.0%	3.9%	3.1%	1.78
Central Falls	1,730	62.4%	62.5%	-0.1%	1.00
Charlestown	1,473	7.5%	4.7%	2.8%	1.59
Coventry	1,639	6.5%	5.0%	1.5%	1.31
Cranston	7,568	38.4%	19.9%	18.5%	1.93
Cumberland	2,052	17.7%	11.6%	6.1%	1.53
East Greenwich	293	9.2%	9.3%	-0.1%	0.99
East Providence	3,182	28.9%	16.7%	12.2%	1.73
Foster	162	10.5%	1.0%	9.5%	10.49
Glocester	931	9.9%	2.3%	7.6%	4.30
Hopkinton	662	14.0%	3.4%	10.6%	4.13
Jamestown	367	6.0%	1.9%	4.1%	3.16
Johnston	2,793	24.2%	12.4%	11.8%	1.95
Lincoln	431	23.9%	13.1%	10.8%	1.82
Little Compton	253	5.1%	1.1%	4.0%	4.67
Middletown	811	19.2%	12.3%	6.9%	1.56
Narragansett	1,468	10.5%	5.7%	4.8%	1.84
Newport	1,341	17.9%	16.4%	1.5%	1.09
North Kingstown	722	11.1%	9.0%	2.1%	1.23
North Providence	1,787	33.5%	15.8%	17.7%	2.12
North Smithfield	697	35.4%	7.4%	28.0%	4.79
Pawtucket	2,970	47.3%	34.6%	12.7%	1.37
Portsmouth	1,853	15.5%	6.9%	8.6%	2.24
Providence	3,283	71.6%	40.3%	31.3%	1.78
Richmond	495	6.9%	4.7%	2.2%	1.46
Scituate	682	5.7%	2.9%	2.8%	1.97
Smithfield	1,748	14.0%	9.9%	4.1%	1.42
South Kingstown	1,569	11.3%	10.4%	0.9%	1.08
Tiverton	505	10.9%	4.1%	6.8%	2.66
Warren	1,276	12.1%	5.6%	6.5%	2.17
Warwick	3,853	17.2%	11.4%	5.8%	1.50
West Greenwich	282	5.7%	5.7%	0.0%	1.00
West Warwick	1,583	11.7%	10.2%	1.5%	1.15
Westerly	1,271	9.4%	7.9%	1.5%	1.19
Woonsocket	1,679	31.3%	21.4%	9.9%	1.46

Table E.5: Ratio of Black EDP to Black Stops, All Departments 2018

Department Name	Number of Stops	% Black Stops	% Black EDP	Absolute Difference	Ratio
Barrington	1,031	5.0%	0.6%	4.5%	8.56
Bristol	1,624	2.5%	1.4%	1.1%	1.80
Burrillville	1,410	2.8%	0.5%	2.3%	5.93
Central Falls	1,730	15.6%	6.7%	8.9%	2.33
Charlestown	1,473	3.0%	0.2%	2.7%	12.33
Coventry	1,639	2.9%	0.9%	1.9%	3.11
Cranston	7,568	12.9%	4.5%	8.3%	2.83
Cumberland	2,052	5.9%	2.0%	3.9%	2.88
East Greenwich	293	2.0%	1.7%	0.3%	1.21
East Providence	3,182	16.4%	4.9%	11.5%	3.33
Foster	162	3.7%	0.2%	3.5%	17.46
Glocester	931	4.6%	0.3%	4.3%	14.46
Hopkinton	662	6.2%	0.3%	5.9%	23.26
Jamestown	367	3.3%	0.5%	2.8%	6.68
Johnston	2,793	8.8%	2.5%	6.3%	3.46
Lincoln	431	7.2%	2.7%	4.5%	2.67
Little Compton	253	2.4%	0.3%	2.1%	9.04
Middletown	811	11.8%	3.8%	8.1%	3.14
Narragansett	1,468	5.3%	1.1%	4.2%	4.95
Newport	1,341	9.9%	5.3%	4.6%	1.88
North Kingstown	722	6.1%	1.8%	4.3%	3.46
North Providence	1,787	16.3%	4.1%	12.2%	3.97
North Smithfield	697	12.8%	1.1%	11.7%	11.88
Pawtucket	2,970	21.1%	9.5%	11.6%	2.22
Portsmouth	1,853	7.7%	1.7%	6.0%	4.63
Providence	3,283	27.8%	8.9%	18.9%	3.12
Richmond	495	3.4%	0.6%	2.9%	6.17
Scituate	682	1.8%	0.4%	1.4%	4.43
Smithfield	1,748	6.2%	2.3%	3.9%	2.73
South Kingstown	1,569	4.9%	2.2%	2.7%	2.19
Tiverton	505	5.1%	1.0%	4.2%	5.27
Warren	1,276	6.6%	1.4%	5.2%	4.82
Warwick	3,853	7.7%	2.4%	5.4%	3.27
West Greenwich	282	2.1%	1.0%	1.1%	2.12
West Warwick	1,583	5.3%	2.1%	3.2%	2.49
Westerly	1,271	4.4%	1.1%	3.3%	3.84
Woonsocket	1,679	10.7%	4.5%	6.1%	2.35

Table E.6: Ratio of Hispanic EDP to Hispanic Stops, All Departments 2018

Department Name	Number of Stops	% Hispanic Stops	% Hispanic EDP	Absolute Difference	Ratio
Barrington	1,031	4.0%	2.5%	1.5%	1.61
Bristol	1,624	2.2%	2.8%	-0.6%	0.78
Burrillville	1,410	3.7%	2.2%	1.5%	1.67
Central Falls	1,730	46.4%	50.3%	-3.9%	0.92
Charlestown	1,473	2.0%	1.7%	0.3%	1.19
Coventry	1,639	2.9%	2.2%	0.7%	1.33
Cranston	7,568	22.0%	9.4%	12.6%	2.35
Cumberland	2,052	10.1%	5.6%	4.5%	1.81
East Greenwich	293	4.1%	3.4%	0.7%	1.22
East Providence	3,182	11.0%	5.1%	5.9%	2.14
Foster	162	5.6%	0.5%	5.1%	11.02
Glocester	931	3.9%	1.6%	2.3%	2.48
Hopkinton	662	6.0%	1.9%	4.1%	3.12
Jamestown	367	2.2%	0.8%	1.4%	2.85
Johnston	2,793	13.5%	6.3%	7.2%	2.14
Lincoln	431	14.8%	6.0%	8.8%	2.46
Little Compton	253	2.4%	0.5%	1.9%	4.99
Middletown	811	6.7%	4.3%	2.4%	1.55
Narragansett	1,468	4.5%	2.0%	2.5%	2.24
Newport	1,341	6.7%	6.3%	0.4%	1.07
North Kingstown	722	3.7%	3.8%	0.0%	1.00
North Providence	1,787	15.9%	7.3%	8.6%	2.18
North Smithfield	697	21.2%	3.7%	17.6%	5.78
Pawtucket	2,970	25.0%	16.0%	9.0%	1.56
Portsmouth	1,853	6.6%	2.4%	4.2%	2.75
Providence	3,283	41.0%	22.9%	18.1%	1.79
Richmond	495	1.2%	2.3%	-1.1%	0.53
Scituate	682	2.6%	1.7%	1.0%	1.57
Smithfield	1,748	6.3%	4.4%	1.9%	1.43
South Kingstown	1,569	3.6%	3.4%	0.2%	1.06
Tiverton	505	4.8%	1.3%	3.5%	3.69
Warren	1,276	4.5%	2.5%	2.0%	1.81
Warwick	3,853	8.2%	4.9%	3.3%	1.68
West Greenwich	282	3.2%	3.2%	0.0%	0.99
West Warwick	1,583	5.2%	4.5%	0.8%	1.18
Westerly	1,271	2.8%	2.7%	0.0%	1.01
Woonsocket	1,679	17.1%	9.9%	7.2%	1.73

Table E.7: Ratio of Minority Residents to Minority Resident Stops, All Departments 2018

Department Name	Number of Residents	% Minority Residents	Resident Stops	% Minority Resident Stops	Difference	Ratio
Barrington	12,292	4.8%	1,156	7.2%	2.4%	1.51
Bristol	19,740	4.2%	1,971	3.3%	-0.9%	0.78
Burrillville	12,749	2.0%	945	2.3%	0.3%	1.16
Central Falls	14,248	69.8%	1,584	81.2%	11.4%	1.16
Charlestown	6,456	4.0%	1,014	5.9%	1.9%	1.46
Coventry	28,241	3.4%	3,697	4.1%	0.6%	1.19
Cranston	66,122	20.3%	9,220	31.4%	11.1%	1.55
Cumberland	26,912	8.3%	1,676	11.2%	2.8%	1.34
East Greenwich	10,174	6.5%	158	7.6%	1.1%	1.17
East Providence	39,044	15.6%	3,215	26.9%	11.3%	1.72
Foster	3,662	0.0%	64	1.6%	1.6%	N/A
Glocester	7,839	1.0%	281	1.1%	0.1%	1.09
Hopkinton	6,443	2.5%	60	6.7%	4.2%	2.72
Jamestown	4,355	0.0%	413	2.2%	2.2%	N/A
Johnston	23,899	8.9%	1,068	19.3%	10.4%	2.16
Lincoln	16,911	8.2%	488	12.3%	4.1%	1.49
Little Compton	2,865	0.0%	311	1.0%	1.0%	N/A
Middletown	12,812	12.5%	786	19.8%	7.3%	1.59
Narragansett	13,911	4.3%	1,066	7.5%	3.2%	1.74
Newport	21,066	18.1%	2,501	30.3%	12.2%	1.67
North Kingstown	20,989	5.5%	1,000	7.9%	2.4%	1.44
North Providence	27,231	14.4%	1,616	27.2%	12.8%	1.89
North Smithfield	9,793	3.5%	263	22.8%	19.4%	6.59
Pawtucket	56,546	38.7%	4,273	60.0%	21.3%	1.55
Portsmouth	13,901	5.5%	1,247	4.8%	-0.7%	0.88
Providence	141,375	56.9%	9,238	86.8%	30.0%	1.53
Richmond	5,992	2.7%	187	3.7%	1.1%	1.40
Scituate	8,282	0.9%	132	2.3%	1.3%	2.41
Smithfield	18,280	5.1%	654	6.9%	1.7%	1.34
South Kingstown	25,918	10.1%	734	9.8%	-0.2%	0.98
Tiverton	13,138	3.2%	696	4.2%	1.0%	1.32
Warren	8,834	3.2%	819	5.7%	2.5%	1.77
Warwick	68,876	7.8%	5,844	10.2%	2.4%	1.30
West Greenwich	4,703	1.8%	141	3.5%	1.8%	2.01
West Warwick	23,958	9.2%	2,406	12.9%	3.8%	1.41
Westerly	18,560	7.0%	2,196	10.2%	3.1%	1.45
Woonsocket	32,338	23.3%	2,859	41.2%	18.0%	1.77

Table E.8: Ratio of Black Residents to Black Resident Stops, All Departments 2018

Department Name	Number of Residents	% Black Residents	Resident Stops	% Black Resident Stops	Difference	Ratio
Barrington	12,292	0.0%	1,156	1.0%	1.0%	N/A
Bristol	19,740	0.7%	1,971	1.7%	1.0%	2.36
Burrillville	12,749	0.0%	945	0.8%	0.8%	N/A
Central Falls	14,248	6.8%	1,584	14.1%	7.2%	2.06
Charlestown	6,456	0.0%	1,014	2.5%	2.5%	N/A
Coventry	28,241	0.5%	3,697	1.9%	1.4%	3.62
Cranston	66,122	4.6%	9,220	9.5%	4.9%	2.05
Cumberland	26,912	1.1%	1,676	3.7%	2.6%	3.25
East Greenwich	10,174	0.8%	158	1.3%	0.5%	1.55
East Providence	39,044	5.2%	3,215	19.8%	14.6%	3.82
Foster	3,662	0.0%	64	0.0%	0.0%	N/A
Glocester	7,839	0.0%	281	0.4%	0.4%	N/A
Hopkinton	6,443	0.0%	60	0.0%	0.0%	N/A
Jamestown	4,355	0.0%	413	1.2%	1.2%	N/A
Johnston	23,899	1.6%	1,068	7.2%	5.6%	4.37
Lincoln	16,911	1.3%	488	4.7%	3.4%	3.57
Little Compton	2,865	0.0%	311	0.3%	0.3%	N/A
Middletown	12,812	4.2%	786	12.3%	8.1%	2.91
Narragansett	13,911	0.7%	1,066	4.0%	3.3%	5.56
Newport	21,066	6.1%	2,501	18.2%	12.1%	2.97
North Kingstown	20,989	0.8%	1,000	4.7%	3.9%	5.80
North Providence	27,231	3.9%	1,616	14.2%	10.3%	3.65
North Smithfield	9,793	0.0%	263	7.2%	7.2%	N/A
Pawtucket	56,546	11.1%	4,273	28.5%	17.4%	2.56
Portsmouth	13,901	1.3%	1,247	3.0%	1.8%	2.43
Providence	141,375	12.4%	9,238	34.3%	21.9%	2.76
Richmond	5,992	0.0%	187	0.5%	0.5%	N/A
Scituate	8,282	0.0%	132	0.0%	0.0%	N/A
Smithfield	18,280	1.2%	654	2.6%	1.4%	2.18
South Kingstown	25,918	2.1%	734	6.3%	4.1%	2.96
Tiverton	13,138	0.8%	696	2.3%	1.5%	3.02
Warren	8,834	0.9%	819	4.0%	3.2%	4.68
Warwick	68,876	1.4%	5,844	4.7%	3.3%	3.27
West Greenwich	4,703	0.0%	141	0.7%	0.7%	N/A
West Warwick	23,958	1.9%	2,406	5.9%	4.1%	3.17
Westerly	18,560	0.8%	2,196	4.4%	3.6%	5.48
Woonsocket	32,338	4.9%	2,859	13.2%	8.3%	2.71

Table E.9: Ratio of Hispanic Residents to Hispanic Resident Stops, All Departments 2018

Department Name	Number of Residents	% Hispanic Residents	Resident Stops	% Hispanic Resident Stops	Difference	Ratio
Barrington	12,292	1.6%	1,156	1.4%	-0.2%	0.87
Bristol	19,740	1.7%	1,971	0.9%	-0.8%	0.52
Burrillville	12,749	1.3%	945	1.1%	-0.3%	0.80
Central Falls	14,248	57.6%	1,584	67.0%	9.4%	1.16
Charlestown	6,456	1.3%	1,014	1.3%	-0.1%	0.95
Coventry	28,241	1.4%	3,697	1.5%	0.1%	1.09
Cranston	66,122	9.2%	9,220	17.0%	7.8%	1.85
Cumberland	26,912	3.8%	1,676	6.1%	2.3%	1.60
East Greenwich	10,174	1.3%	158	2.5%	1.2%	1.92
East Providence	39,044	3.1%	3,215	6.3%	3.2%	2.06
Foster	3,662	0.0%	64	0.0%	0.0%	N/A
Glocester	7,839	1.0%	281	0.4%	-0.6%	0.36
Hopkinton	6,443	1.6%	60	5.0%	3.4%	3.07
Jamestown	4,355	0.0%	413	0.5%	0.5%	N/A
Johnston	23,899	4.6%	1,068	9.6%	5.1%	2.12
Lincoln	16,911	3.3%	488	5.5%	2.3%	1.70
Little Compton	2,865	0.0%	311	0.6%	0.6%	N/A
Middletown	12,812	3.9%	786	5.5%	1.6%	1.41
Narragansett	13,911	1.4%	1,066	2.3%	0.8%	1.60
Newport	21,066	6.8%	2,501	11.6%	4.8%	1.70
North Kingstown	20,989	1.8%	1,000	2.1%	0.3%	1.14
North Providence	27,231	6.5%	1,616	12.1%	5.7%	1.88
North Smithfield	9,793	1.8%	263	14.4%	12.6%	7.90
Pawtucket	56,546	17.4%	4,273	31.1%	13.7%	1.79
Portsmouth	13,901	1.7%	1,247	0.8%	-0.9%	0.48
Providence	141,375	33.5%	9,238	49.9%	16.3%	1.49
Richmond	5,992	1.5%	187	1.6%	0.2%	1.10
Scituate	8,282	0.9%	132	1.5%	0.6%	1.61
Smithfield	18,280	2.0%	654	3.2%	1.2%	1.62
South Kingstown	25,918	2.7%	734	2.5%	-0.3%	0.90
Tiverton	13,138	0.8%	696	1.6%	0.7%	1.87
Warren	8,834	1.4%	819	1.1%	-0.3%	0.78
Warwick	68,876	2.8%	5,844	3.9%	1.1%	1.41
West Greenwich	4,703	1.8%	141	2.8%	1.1%	1.61
West Warwick	23,958	3.8%	2,406	6.1%	2.2%	1.58
Westerly	18,560	2.2%	2,196	2.9%	0.6%	1.29
Woonsocket	32,338	10.7%	2,859	24.7%	14.1%	2.32

Table E.10: Departments with Disparities Relative to Descriptive Benchmarks (Sorted by Total Score)

Department Name	State Average			EDP			Resident Population			Total
	M	B	H	M	B	H	M	B	H	
Providence	11.2%	10.40%		31.3%	18.9%	18.1%	30.0%	21.9%	16.3%	8
North Smithfield	28.7%		16.80%	28.0%	11.7%	17.6%	19.4%	7.2%	12.6%	7.5
North Providence	13.5%			17.7%	12.2%	8.6%	12.8%	10.3%	5.7%	6
Cranston	11.5%			18.5%	8.3%	12.6%	11.1%		7.8%	5
Pawtucket				12.7%	11.6%		21.3%	17.4%	13.7%	5
East Providence				12.2%	11.5%	5.9%	11.3%	14.6%		4.5
Johnston				11.8%	6.3%	7.2%	10.4%	5.6%	5.1%	4
Woonsocket					6.1%		18.0%	8.3%	14.1%	3
Central Falls					8.9%		11.4%	7.2%		2
Newport							12.2%	12.1%		2
Hopkinton				10.6%	5.9%					1.5
Lincoln				10.8%		8.8%				1.5
Foster				9.5%		5.1%				1
Middletown					8.1%			8.1%		1
Portsmouth				8.6%	6.0%					1
Warren				6.5%	5.2%					1
Barrington				5.8%						0.5
Glocester				7.6%						0.5
Tiverton				6.8%						0.5
Warwick					5.4%					0.5

APPENDIX F: STOP DISPOSITION ANALYSIS DATA TABLES

Table F.1: Multinomial Logistic Regression of Outcome on Minority Status and Reason for Stop by Department, All Traffic Stops 2018

Department	Variable	Non-White	Black	Hispanic	Black or Hispanic
Barrington	Chi^2	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A
	Observations	3405	3298	3230	3432
	Pseudo R2	0.216	0.219	0.218	0.223
Bristol	Chi^2	1,376.536***	2,174.905***	N/A	1,259.943***
	P-Value	0.001	0.001	N/A	0.001
	Observations	4638	4581	4513	4700
	Pseudo R2	0.171	0.171	0.167	0.173
Burrillville	Chi^2	2,442.719***	9,951.487***	1,796.802***	960.257***
	P-Value	0.001	0.001	0.001	0.001
	Observations	4369	4349	4354	4486
	Pseudo R2	0.252	0.252	0.252	0.252
Central Falls	Chi^2	N/A	N/A	N/A	1,853.645***
	P-Value	N/A	N/A	N/A	0.001
	Observations	2837	2824	4046	4873
	Pseudo R2	0.182	0.182	0.17	0.157
Charlestown	Chi^2	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A
	Observations	4410	4321	4234	4374
	Pseudo R2	0.144	0.144	0.145	0.143
Coventry	Chi^2	1,717.449***	98.765***	N/A	1,921.151***
	P-Value	0.001	0.001	N/A	0.001
	Observations	6884	6830	6794	7020
	Pseudo R2	0.112	0.112	0.111	0.112
Cranston	Chi^2	25.521**	22.034**	754.453***	23.472**
	P-Value	0.013	0.037	0.001	0.024
	Observations	23416	22345	23447	27416
	Pseudo R2	0.18	0.181	0.18	0.172
Cumberland	Chi^2	2,225.802***	2,281.055***	N/A	N/A
	P-Value	0.001	0.001	N/A	N/A
	Observations	4299	4212	4424	4768
	Pseudo R2	0.151	0.153	0.145	0.145
DEM	Chi^2	N/A	N/A	2,030.737***	N/A
	P-Value	N/A	N/A	0.001	N/A
	Observations	203	192	203	230
	Pseudo R2	0.697	0.705	0.697	0.671
East Greenwich	Chi^2	N/A	171.438***	N/A	N/A
	P-Value	N/A	0.001	N/A	N/A
	Observations	928	910	901	936
	Pseudo R2	0.246	0.256	0.25	0.261
East Providence	Chi^2	16.764	14.47	21.059**	25.975**
	P-Value	0.158	0.272	0.05	0.01
	Observations	11708	11512	10174	12558
	Pseudo R2	0.181	0.181	0.186	0.173
Foster	Chi^2	278.694***	N/A	3,604.252***	43,017.140***
	P-Value	0.001	N/A	0.001	0.001
	Observations	796	762	762	818
	Pseudo R2	0.331	0.345	0.361	0.356

Table F.1: Multinomial Logistic Regression of Outcome on Minority Status and Reason for Stop by Department, All Traffic Stops 2018

Department	Variable	Non-White	Black	Hispanic	Black or Hispanic
Glocester	Chi^2	1,614.015***	N/A	2,888.009***	24.375***
	P-Value	0.001	N/A	0.001	0.001
	Observations	2287	2265	2230	2314
	Pseudo R2	0.177	0.179	0.172	0.172
Hopkinton	Chi^2	9,920.260***	9,386.206***	N/A	N/A
	P-Value	0.001	0.001	N/A	N/A
	Observations	2116	2041	1983	2167
	Pseudo R2	0.188	0.194	0.19	0.189
Jamestown	Chi^2	3,320.860***	2,115.090***	N/A	3,066.691***
	P-Value	0.001	0.001	N/A	0.001
	Observations	1604	1568	1549	1619
	Pseudo R2	0.243	0.247	0.246	0.243
Johnston	Chi^2	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A
	Observations	4543	4429	4597	5116
	Pseudo R2	0.18	0.181	0.174	0.171
Lincoln	Chi^2	N/A	N/A	N/A	1,072.671***
	P-Value	N/A	N/A	N/A	0.001
	Observations	1548	1503	1608	1748
	Pseudo R2	0.239	0.243	0.216	0.199
Little Compton	Chi^2	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A
	Observations	1279	1272	1263	1295
	Pseudo R2	0.312	0.312	0.317	0.31
Middletown	Chi^2	1,243.668***	1,843.598***	N/A	N/A
	P-Value	0.001	0.001	N/A	N/A
	Observations	4006	3931	3694	4201
	Pseudo R2	0.152	0.151	0.156	0.146
Narragansett	Chi^2	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A
	Observations	4781	4714	4607	4875
	Pseudo R2	0.158	0.158	0.159	0.156
Newport	Chi^2	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A
	Observations	6034	5940	5679	6307
	Pseudo R2	0.186	0.187	0.2	0.185
North Kingstown	Chi^2	3,118.239***	2,686.318***	12.295	705.111***
	P-Value	0.001	0.001	0.137	0.001
	Observations	4060	3988	3900	4184
	Pseudo R2	0.18	0.18	0.185	0.179
North Providence	Chi^2	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A
	Observations	4573	4521	4375	5225
	Pseudo R2	0.194	0.195	0.207	0.193
North Smithfield	Chi^2	877.307***	1,018.135***	N/A	573.908***
	P-Value	0.001	0.001	N/A	0.001
	Observations	2925	2869	2859	3190
	Pseudo R2	0.218	0.221	0.215	0.208

Table F.1: Multinomial Logistic Regression of Outcome on Minority Status and Reason for Stop by Department, All Traffic Stops 2018

Department	Variable	Non-White	Black	Hispanic	Black or Hispanic
Pawtucket	Chi^2	33.631***	35.061***	28.148***	25.729**
	P-Value	0.001	0.001	0.004	0.012
	Observations	8480	8371	7919	10413
	Pseudo R2	0.252	0.252	0.261	0.254
Portsmouth	Chi^2	N/A	1,278.161***	1,606.862***	55.737***
	P-Value	N/A	0.001	0.001	0.001
	Observations	6423	6303	6036	6697
	Pseudo R2	0.143	0.143	0.149	0.143
Providence	Chi^2	N/A	N/A	N/A	55.737***
	P-Value	N/A	N/A	N/A	0.001
	Observations	6697	6697	6697	6697
	Pseudo R2	0.143	0.143	0.143	0.143
Richmond	Chi^2	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A
	Observations	1713	1667	1628	1691
	Pseudo R2	0.25	0.261	0.284	0.254
RISP - Hope Valley	Chi^2	95.775***	71.498***	930.081***	78.755***
	P-Value	0.001	0.001	0.001	0.001
	Observations	7480	7032	6743	8124
	Pseudo R2	0.128	0.128	0.13	0.123
RISP - HQ	Chi^2	N/A	1,260.651***	N/A	601.205***
	P-Value	N/A	0.001	N/A	0.001
	Observations	2012	1978	1927	2242
	Pseudo R2	0.256	0.259	0.284	0.275
RISP - Lincoln	Chi^2	35.429***	34.782***	19.479*	32.289***
	P-Value	0.001	0.001	0.078	0.001
	Observations	10175	9847	9665	12192
	Pseudo R2	0.104	0.104	0.112	0.098
RISP - Portsmouth	Chi^2	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A
	Observations	1326	1297	1261	1368
	Pseudo R2	0.134	0.134	0.145	0.133
RISP - Scituate	Chi^2	56.692***	47.143***	2,204.506***	N/A
	P-Value	0.001	0.001	0.001	N/A
	Observations	5612	5444	5409	6563
	Pseudo R2	0.122	0.125	0.131	0.123
RISP - Wickford	Chi^2	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A
	Observations	9689	9416	8965	10631
	Pseudo R2	0.172	0.173	0.175	0.167
Scituate	Chi^2	9,363.541***	N/A	9.187	1,323.670***
	P-Value	0.001	N/A	0.238	0.001
	Observations	2062	2030	2028	2091
	Pseudo R2	0.211	0.211	0.209	0.208
Smithfield	Chi^2	494.514***	N/A	N/A	2,006.619***
	P-Value	0.001	N/A	N/A	0.001
	Observations	4639	4564	4568	4899
	Pseudo R2	0.134	0.133	0.128	0.128

Table F.1: Multinomial Logistic Regression of Outcome on Minority Status and Reason for Stop by Department, All Traffic Stops 2018

Department	Variable	Non-White	Black	Hispanic	Black or Hispanic
South Kingstown	Chi^2	692.101***	1,338.546***	1,533.586***	596.695***
	P-Value	0.001	0.001	0.001	0.001
	Observations	5786	5620	5416	5790
	Pseudo R2	0.158	0.159	0.165	0.158
Tiverton	Chi^2	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A
	Observations	2418	2394	2356	2503
	Pseudo R2	0.18	0.182	0.173	0.171
Univ Of Rhode Island	Chi^2	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A
	Observations	1842	1761	1692	1872
	Pseudo R2	0.163	0.165	0.162	0.156
Warren	Chi^2	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A
	Observations	3405	3372	3264	3477
	Pseudo R2	0.173	0.174	0.174	0.17
Warwick	Chi^2	320.378***	341.798***	281.070***	327.311***
	P-Value	0.001	0.001	0.001	0.001
	Observations	13636	13361	13194	14481
	Pseudo R2	0.141	0.142	0.14	0.136
West Greenwich	Chi^2	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A
	Observations	903	896	892	923
	Pseudo R2	0.458	0.456	0.453	0.448
West Warwick	Chi^2	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A
	Observations	5227	5165	5131	5462
	Pseudo R2	0.181	0.18	0.182	0.178
Westerly	Chi^2	1,106.860***	1,121.709***	1,448.083***	1,110.313***
	P-Value	0.001	0.001	0.001	0.001
	Observations	4742	4644	4566	4760
	Pseudo R2	0.149	0.149	0.144	0.144
Woonsocket	Chi^2	671.784***	552.245***	123.794***	78.597***
	P-Value	0.001	0.001	0.001	0.001
	Observations	4849	4654	4987	5740
	Pseudo R2	0.157	0.158	0.155	0.148

APPENDIX G: SEARCH ANALYSIS DATA TABLES

Table G.1: Chi-Square Test of Hit-Rate by Department, All Discretionary Searches

Department	Variable	Caucasian	Non-Caucasian	Black	Hispanic	Black or Hispanic
Barrington	Hit Rate	N/A	N/A	N/A	N/A	N/A
	Contraband	N/A	N/A	N/A	N/A	N/A
	Searches	N/A	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A	N/A
	Chi2	N/A	N/A	N/A	N/A	N/A
Bristol	Hit Rate	N/A	N/A	N/A	N/A	N/A
	Contraband	N/A	N/A	N/A	N/A	N/A
	Searches	N/A	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A	N/A
	Chi2	N/A	N/A	N/A	N/A	N/A
Burrillville	Hit Rate	68.888%	N/A	N/A	N/A	N/A
	Contraband	31	N/A	N/A	N/A	N/A
	Searches	45	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A	N/A
	Chi2	N/A	N/A	N/A	N/A	N/A
Central Falls	Hit Rate	N/A	N/A	N/A	N/A	61.111%
	Contraband	N/A	N/A	N/A	N/A	22
	Searches	N/A	N/A	N/A	N/A	36
	P-Value	N/A	N/A	N/A	N/A	0.158
	Q-Value	N/A	N/A	N/A	N/A	0.695
	Chi2	N/A	N/A	N/A	N/A	1.980
Charlestown	Hit Rate	N/A	N/A	N/A	N/A	N/A
	Contraband	N/A	N/A	N/A	N/A	N/A
	Searches	N/A	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A	N/A
	Chi2	N/A	N/A	N/A	N/A	N/A
Coventry	Hit Rate	63.333%	N/A	N/A	N/A	N/A
	Contraband	57	N/A	N/A	N/A	N/A
	Searches	90	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A	N/A
	Chi2	N/A	N/A	N/A	N/A	N/A
Cranston	Hit Rate	58.139%	55.555%	55.669%	56.613%	55.509%
	Contraband	50	110	108	107	136
	Searches	86	198	194	189	245
	P-Value	N/A	0.686	0.700	0.813	0.671
	Q-Value	N/A	0.801	0.801	0.875	0.801
	Chi2	N/A	0.163	0.148	0.056	0.179
Cumberland	Hit Rate	48.387%	N/A	N/A	N/A	N/A
	Contraband	15	N/A	N/A	N/A	N/A
	Searches	31	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A	N/A
	Chi2	N/A	N/A	N/A	N/A	N/A

Table G.1: Chi-Square Test of Hit-Rate by Department, All Discretionary Searches

Department	Variable	Caucasian	Non-Caucasian	Black	Hispanic	Black or Hispanic
DEM	Hit Rate	N/A	N/A	N/A	N/A	N/A
	Contraband	N/A	N/A	N/A	N/A	N/A
	Searches	N/A	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A	N/A
	Chi2	N/A	N/A	N/A	N/A	N/A
East Greenwich	Hit Rate	N/A	N/A	N/A	N/A	N/A
	Contraband	N/A	N/A	N/A	N/A	N/A
	Searches	N/A	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A	N/A
	Chi2	N/A	N/A	N/A	N/A	N/A
East Providence	Hit Rate	51.680%	47.801%	47.790%	48.421%	48.131%
	Contraband	123	174	173	138	206
	Searches	238	364	362	285	428
	P-Value	N/A	0.351	0.351	0.458	0.379
	Q-Value	N/A	0.695	0.695	0.763	0.695
	Chi2	N/A	0.865	0.870	0.550	0.771
Foster	Hit Rate	N/A	N/A	N/A	N/A	N/A
	Contraband	N/A	N/A	N/A	N/A	N/A
	Searches	N/A	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A	N/A
	Chi2	N/A	N/A	N/A	N/A	N/A
Glocester	Hit Rate	N/A	N/A	N/A	N/A	N/A
	Contraband	N/A	N/A	N/A	N/A	N/A
	Searches	N/A	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A	N/A
	Chi2	N/A	N/A	N/A	N/A	N/A
Hopkinton	Hit Rate	63.158%	N/A	N/A	N/A	N/A
	Contraband	24	N/A	N/A	N/A	N/A
	Searches	38	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A	N/A
	Chi2	N/A	N/A	N/A	N/A	N/A
Jamestown	Hit Rate	76.471%	N/A	N/A	N/A	N/A
	Contraband	26	N/A	N/A	N/A	N/A
	Searches	34	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A	N/A
	Chi2	N/A	N/A	N/A	N/A	N/A
Johnston	Hit Rate	N/A	N/A	N/A	N/A	N/A
	Contraband	N/A	N/A	N/A	N/A	N/A
	Searches	N/A	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A	N/A
	Chi2	N/A	N/A	N/A	N/A	N/A

Table G.1: Chi-Square Test of Hit-Rate by Department, All Discretionary Searches

Department	Variable	Caucasian	Non-Caucasian	Black	Hispanic	Black or Hispanic
Lincoln	Hit Rate	N/A	N/A	N/A	N/A	N/A
	Contraband	N/A	N/A	N/A	N/A	N/A
	Searches	N/A	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A	N/A
	Chi2	N/A	N/A	N/A	N/A	N/A
Little Compton	Hit Rate	N/A	93.750%	93.750%	N/A	93.939%
	Contraband	N/A	30	30	N/A	31
	Searches	N/A	32	32	N/A	33
	P-Value	N/A	0.211	0.211	N/A	0.197
	Q-Value	N/A	0.695	0.695	N/A	0.695
	Chi2	N/A	1.555	1.555	N/A	1.659
Middletown	Hit Rate	50%	N/A	N/A	N/A	36.666%
	Contraband	32	N/A	N/A	N/A	11
	Searches	64	N/A	N/A	N/A	30
	P-Value	N/A	N/A	N/A	N/A	0.225
	Q-Value	N/A	N/A	N/A	N/A	0.695
	Chi2	N/A	N/A	N/A	N/A	1.463
Narragansett	Hit Rate	57.895%	63.333%	63.333%	N/A	63.333%
	Contraband	22	19	19	N/A	19
	Searches	38	30	30	N/A	30
	P-Value	N/A	0.648	0.648	N/A	0.648
	Q-Value	N/A	0.801	0.801	N/A	0.801
	Chi2	N/A	0.207	0.207	N/A	0.207
Newport	Hit Rate	36.666%	42.856%	42.856%	45.833%	43.220%
	Contraband	11	45	45	44	51
	Searches	30	105	105	96	118
	P-Value	N/A	0.544	0.544	0.377	0.515
	Q-Value	N/A	0.787	0.787	0.695	0.787
	Chi2	N/A	0.368	0.368	0.781	0.421
North Kingstown	Hit Rate	47.272%	N/A	N/A	N/A	N/A
	Contraband	26	N/A	N/A	N/A	N/A
	Searches	55	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A	N/A
	Chi2	N/A	N/A	N/A	N/A	N/A
North Providence	Hit Rate	N/A	56.409%%++	55.263%%++	N/A	52.500%%+
	Contraband	N/A	22	21	N/A	21
	Searches	N/A	39	38	N/A	40
	P-Value	N/A	0.039	0.046	N/A	0.064
	Q-Value	N/A	0.647	0.647	N/A	0.695
	Chi2	N/A	4.222	3.944	N/A	3.401
North Smithfield	Hit Rate	N/A	20.587%	20.895%	17.459%	21.127%
	Contraband	N/A	14	14	11	15
	Searches	N/A	68	67	63	71
	P-Value	N/A	0.259	0.254	0.307	0.250
	Q-Value	N/A	0.695	0.695	0.695	0.695
	Chi2	N/A	1.274	1.297	1.041	1.315

Table G.1: Chi-Square Test of Hit-Rate by Department, All Discretionary Searches

Department	Variable	Caucasian	Non-Caucasian	Black	Hispanic	Black or Hispanic
Pawtucket	Hit Rate	37.974%	43.750%	44.304%	48.514%	45.945%
	Contraband	30	70	70	49	102
	Searches	79	160	158	101	222
	P-Value	N/A	0.395	0.351	0.157	0.219
	Q-Value	N/A	0.699	0.695	0.695	0.695
	Chi2	N/A	0.725	0.865	2	1.503
Portsmouth	Hit Rate	N/A	N/A	N/A	N/A	N/A
	Contraband	N/A	N/A	N/A	N/A	N/A
	Searches	N/A	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A	N/A
	Chi2	N/A	N/A	N/A	N/A	N/A
Providence	Hit Rate	45.569%	45.032%	45.174%	45.435%	44.451%
	Contraband	108	1115	1100	1075	1378
	Searches	237	2476	2435	2366	3100
	P-Value	N/A	0.874	0.907	0.967	0.739
	Q-Value	N/A	0.924	0.940	0.967	0.811
	Chi2	N/A	0.025	0.014	0.002	0.111
Richmond	Hit Rate	74.194%	N/A	N/A	N/A	N/A
	Contraband	23	N/A	N/A	N/A	N/A
	Searches	31	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A	N/A
	Chi2	N/A	N/A	N/A	N/A	N/A
RISP - Hope Valley	Hit Rate	57.143%	61.363%	61.111%	57.576%	60.345%
	Contraband	40	27	22	19	35
	Searches	70	44	36	33	58
	P-Value	N/A	0.656	0.694	0.967	0.713
	Q-Value	N/A	0.801	0.801	0.967	0.801
	Chi2	N/A	0.199	0.153	0.002	0.134
RISP - HQ	Hit Rate	N/A	N/A	N/A	N/A	N/A
	Contraband	N/A	N/A	N/A	N/A	N/A
	Searches	N/A	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A	N/A
	Chi2	N/A	N/A	N/A	N/A	N/A
RISP - Lincoln	Hit Rate	75%	48.570%%++	48.570%%++	N/A	60.416%
	Contraband	27	17	17	N/A	29
	Searches	36	35	35	N/A	48
	P-Value	N/A	0.021	0.021	N/A	0.160
	Q-Value	N/A	0.600	0.600	N/A	0.695
	Chi2	N/A	5.260	5.260	N/A	1.968
RISP - Portsmouth	Hit Rate	N/A	N/A	N/A	N/A	N/A
	Contraband	N/A	N/A	N/A	N/A	N/A
	Searches	N/A	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A	N/A
	Chi2	N/A	N/A	N/A	N/A	N/A

Table G.1: Chi-Square Test of Hit-Rate by Department, All Discretionary Searches

Department	Variable	Caucasian	Non-Caucasian	Black	Hispanic	Black or Hispanic
RISP - Scituate	Hit Rate	N/A	N/A	N/A	N/A	N/A
	Contraband	N/A	N/A	N/A	N/A	N/A
	Searches	N/A	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A	N/A
	Chi2	N/A	N/A	N/A	N/A	N/A
RISP - Wickford	Hit Rate	56.250%	N/A	N/A	N/A	N/A
	Contraband	18	N/A	N/A	N/A	N/A
	Searches	32	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A	N/A
	Chi2	N/A	N/A	N/A	N/A	N/A
Scituate	Hit Rate	N/A	N/A	N/A	N/A	N/A
	Contraband	N/A	N/A	N/A	N/A	N/A
	Searches	N/A	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A	N/A
	Chi2	N/A	N/A	N/A	N/A	N/A
Smithfield	Hit Rate	N/A	N/A	N/A	N/A	N/A
	Contraband	N/A	N/A	N/A	N/A	N/A
	Searches	N/A	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A	N/A
	Chi2	N/A	N/A	N/A	N/A	N/A
South Kingstown	Hit Rate	69.231%	N/A	N/A	N/A	74.194%
	Contraband	27	N/A	N/A	N/A	23
	Searches	39	N/A	N/A	N/A	31
	P-Value	N/A	N/A	N/A	N/A	0.648
	Q-Value	N/A	N/A	N/A	N/A	0.801
	Chi2	N/A	N/A	N/A	N/A	0.208
Tiverton	Hit Rate	71.764%	N/A	N/A	N/A	N/A
	Contraband	61	N/A	N/A	N/A	N/A
	Searches	85	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A	N/A
	Chi2	N/A	N/A	N/A	N/A	N/A
Univ Of Rhode Island	Hit Rate	61.111%	N/A	N/A	N/A	N/A
	Contraband	22	N/A	N/A	N/A	N/A
	Searches	36	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A	N/A
	Chi2	N/A	N/A	N/A	N/A	N/A
Warren	Hit Rate	29.031%	N/A	N/A	N/A	N/A
	Contraband	9	N/A	N/A	N/A	N/A
	Searches	31	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A	N/A
	Chi2	N/A	N/A	N/A	N/A	N/A

Table G.1: Chi-Square Test of Hit-Rate by Department, All Discretionary Searches

Department	Variable	Caucasian	Non-Caucasian	Black	Hispanic	Black or Hispanic
Warwick	Hit Rate	64.444%	74.359%	74.359%	68.750%	72.339%
	Contraband	29	29	29	22	34
	Searches	45	39	39	32	47
	P-Value	N/A	0.326	0.326	0.694	0.414
	Q-Value	N/A	0.695	0.695	0.801	0.713
	Chi2	N/A	0.961	0.961	0.155	0.663
West Greenwich	Hit Rate	N/A	N/A	N/A	N/A	N/A
	Contraband	N/A	N/A	N/A	N/A	N/A
	Searches	N/A	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A	N/A
	Chi2	N/A	N/A	N/A	N/A	N/A
West Warwick	Hit Rate	78.946%	N/A	N/A	N/A	N/A
	Contraband	30	N/A	N/A	N/A	N/A
	Searches	38	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A	N/A
	Chi2	N/A	N/A	N/A	N/A	N/A
Westerly	Hit Rate	59.090%	64.197%	64.934%	67.142%	66.250%
	Contraband	39	52	50	47	53
	Searches	66	81	77	70	80
	P-Value	N/A	0.526	0.472	0.330	0.372
	Q-Value	N/A	0.787	0.763	0.695	0.695
	Chi2	N/A	0.402	0.515	0.947	0.795
Woonsocket	Hit Rate	44.928%	35.848%	37.255%	34.615%	35.245%
	Contraband	62	19	19	27	43
	Searches	138	53	51	78	122
	P-Value	N/A	0.256	0.344	0.138	0.112
	Q-Value	N/A	0.695	0.695	0.695	0.695
	Chi2	N/A	1.292	0.894	2.187	2.520

Table G.2: Chi-Square Test of Hit-Rate by Department, Discretionary Searches (Restricted)

Department	Variable	Caucasian	Non-Caucasian	Black	Hispanic	Black or Hispanic
Barrington	Hit Rate	N/A	N/A	N/A	N/A	N/A
	Contraband	N/A	N/A	N/A	N/A	N/A
	Searches	N/A	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A	N/A
	Chi2	N/A	N/A	N/A	N/A	N/A
Bristol	Hit Rate	N/A	N/A	N/A	N/A	N/A
	Contraband	N/A	N/A	N/A	N/A	N/A
	Searches	N/A	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A	N/A
	Chi2	N/A	N/A	N/A	N/A	N/A
Burrillville	Hit Rate	62.500%	N/A	N/A	N/A	N/A
	Contraband	20	N/A	N/A	N/A	N/A
	Searches	32	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A	N/A
	Chi2	N/A	N/A	N/A	N/A	N/A
Central Falls	Hit Rate	N/A	N/A	N/A	N/A	N/A
	Contraband	N/A	N/A	N/A	N/A	N/A
	Searches	N/A	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A	N/A
	Chi2	N/A	N/A	N/A	N/A	N/A
Charlestown	Hit Rate	N/A	N/A	N/A	N/A	N/A
	Contraband	N/A	N/A	N/A	N/A	N/A
	Searches	N/A	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A	N/A
	Chi2	N/A	N/A	N/A	N/A	N/A
Coventry	Hit Rate	68.750%	N/A	N/A	N/A	N/A
	Contraband	44	N/A	N/A	N/A	N/A
	Searches	64	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A	N/A
	Chi2	N/A	N/A	N/A	N/A	N/A
Cranston	Hit Rate	58.208%	61.437%	61.744%	65.068%	62.234%
	Contraband	39	94	92	95	117
	Searches	67	153	149	146	188
	P-Value	N/A	0.652	0.623	0.335	0.561
	Q-Value	N/A	0.782	0.782	0.782	0.782
	Chi2	N/A	0.202	0.241	0.925	0.337
Cumberland	Hit Rate	N/A	N/A	N/A	N/A	N/A
	Contraband	N/A	N/A	N/A	N/A	N/A
	Searches	N/A	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A	N/A
	Chi2	N/A	N/A	N/A	N/A	N/A

Table G.2: Chi-Square Test of Hit-Rate by Department, Discretionary Searches (Restricted)

Department	Variable	Caucasian	Non-Caucasian	Black	Hispanic	Black or Hispanic
DEM	Hit Rate	N/A	N/A	N/A	N/A	N/A
	Contraband	N/A	N/A	N/A	N/A	N/A
	Searches	N/A	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A	N/A
	Chi2	N/A	N/A	N/A	N/A	N/A
East Greenwich	Hit Rate	N/A	N/A	N/A	N/A	N/A
	Contraband	N/A	N/A	N/A	N/A	N/A
	Searches	N/A	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A	N/A
	Chi2	N/A	N/A	N/A	N/A	N/A
East Providence	Hit Rate	51.596%	46.814%	46.794%	47.325%	46.832%
	Contraband	97	147	146	115	170
	Searches	188	314	312	243	363
	P-Value	N/A	0.300	0.298	0.379	0.289
	Q-Value	N/A	0.782	0.782	0.782	0.782
	Chi2	N/A	1.075	1.082	0.773	1.125
Foster	Hit Rate	N/A	N/A	N/A	N/A	N/A
	Contraband	N/A	N/A	N/A	N/A	N/A
	Searches	N/A	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A	N/A
	Chi2	N/A	N/A	N/A	N/A	N/A
Glocester	Hit Rate	N/A	N/A	N/A	N/A	N/A
	Contraband	N/A	N/A	N/A	N/A	N/A
	Searches	N/A	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A	N/A
	Chi2	N/A	N/A	N/A	N/A	N/A
Hopkinton	Hit Rate	N/A	N/A	N/A	N/A	N/A
	Contraband	N/A	N/A	N/A	N/A	N/A
	Searches	N/A	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A	N/A
	Chi2	N/A	N/A	N/A	N/A	N/A
Jamestown	Hit Rate	N/A	N/A	N/A	N/A	N/A
	Contraband	N/A	N/A	N/A	N/A	N/A
	Searches	N/A	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A	N/A
	Chi2	N/A	N/A	N/A	N/A	N/A
Johnston	Hit Rate	N/A	N/A	N/A	N/A	N/A
	Contraband	N/A	N/A	N/A	N/A	N/A
	Searches	N/A	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A	N/A
	Chi2	N/A	N/A	N/A	N/A	N/A

Table G.2: Chi-Square Test of Hit-Rate by Department, Discretionary Searches (Restricted)

Department	Variable	Caucasian	Non-Caucasian	Black	Hispanic	Black or Hispanic
Lincoln	Hit Rate	N/A	N/A	N/A	N/A	N/A
	Contraband	N/A	N/A	N/A	N/A	N/A
	Searches	N/A	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A	N/A
	Chi2	N/A	N/A	N/A	N/A	N/A
Little Compton	Hit Rate	N/A	N/A	N/A	N/A	N/A
	Contraband	N/A	N/A	N/A	N/A	N/A
	Searches	N/A	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A	N/A
	Chi2	N/A	N/A	N/A	N/A	N/A
Middletown	Hit Rate	52.941%	N/A	N/A	N/A	N/A
	Contraband	27	N/A	N/A	N/A	N/A
	Searches	51	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A	N/A
	Chi2	N/A	N/A	N/A	N/A	N/A
Narragansett	Hit Rate	N/A	N/A	N/A	N/A	N/A
	Contraband	N/A	N/A	N/A	N/A	N/A
	Searches	N/A	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A	N/A
	Chi2	N/A	N/A	N/A	N/A	N/A
Newport	Hit Rate	N/A	45.744%	45.744%	47.618%	45.631%
	Contraband	N/A	43	43	40	47
	Searches	N/A	94	94	84	103
	P-Value	N/A	0.754	0.754	0.634	0.760
	Q-Value	N/A	0.782	0.782	0.782	0.782
	Chi2	N/A	0.097	0.097	0.224	0.093
North Kingstown	Hit Rate	55.263%	N/A	N/A	N/A	N/A
	Contraband	21	N/A	N/A	N/A	N/A
	Searches	38	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A	N/A
	Chi2	N/A	N/A	N/A	N/A	N/A
North Providence	Hit Rate	N/A	N/A	N/A	N/A	N/A
	Contraband	N/A	N/A	N/A	N/A	N/A
	Searches	N/A	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A	N/A
	Chi2	N/A	N/A	N/A	N/A	N/A
North Smithfield	Hit Rate	N/A	20%	20.339%	16.364%	20.635%
	Contraband	N/A	12	12	9	13
	Searches	N/A	60	59	55	63
	P-Value	N/A	0.388	0.384	0.446	0.379
	Q-Value	N/A	0.782	0.782	0.782	0.782
	Chi2	N/A	0.740	0.757	0.580	0.771

Table G.2: Chi-Square Test of Hit-Rate by Department, Discretionary Searches (Restricted)

Department	Variable	Caucasian	Non-Caucasian	Black	Hispanic	Black or Hispanic
Pawtucket	Hit Rate	43.181%	46.847%	46.847%	54.054%	49.375%
	Contraband	19	52	52	40	79
	Searches	44	111	111	74	160
	P-Value	N/A	0.680	0.680	0.252	0.465
	Q-Value	N/A	0.782	0.782	0.782	0.782
	Chi2	N/A	0.171	0.171	1.304	0.529
Portsmouth	Hit Rate	N/A	N/A	N/A	N/A	N/A
	Contraband	N/A	N/A	N/A	N/A	N/A
	Searches	N/A	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A	N/A
	Chi2	N/A	N/A	N/A	N/A	N/A
Providence	Hit Rate	37.255%	38.687%	38.805%	39.119%	38.220%
	Contraband	76	843	832	818	1048
	Searches	204	2179	2144	2091	2742
	P-Value	N/A	0.688	0.663	0.601	0.783
	Q-Value	N/A	0.782	0.782	0.782	0.783
	Chi2	N/A	0.162	0.188	0.272	0.075
Richmond	Hit Rate	N/A	N/A	N/A	N/A	N/A
	Contraband	N/A	N/A	N/A	N/A	N/A
	Searches	N/A	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A	N/A
	Chi2	N/A	N/A	N/A	N/A	N/A
RISP - Hope Valley	Hit Rate	58.333%	66.666%	N/A	N/A	66.666%
	Contraband	28	22	N/A	N/A	26
	Searches	48	33	N/A	N/A	39
	P-Value	N/A	0.448	N/A	N/A	0.425
	Q-Value	N/A	0.782	N/A	N/A	0.782
	Chi2	N/A	0.574	N/A	N/A	0.634
RISP - HQ	Hit Rate	N/A	N/A	N/A	N/A	N/A
	Contraband	N/A	N/A	N/A	N/A	N/A
	Searches	N/A	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A	N/A
	Chi2	N/A	N/A	N/A	N/A	N/A
RISP - Lincoln	Hit Rate	N/A	N/A	N/A	N/A	67.647%%+
	Contraband	N/A	N/A	N/A	N/A	23
	Searches	N/A	N/A	N/A	N/A	34
	P-Value	N/A	N/A	N/A	N/A	0.068
	Q-Value	N/A	N/A	N/A	N/A	0.782
	Chi2	N/A	N/A	N/A	N/A	3.296
RISP - Portsmouth	Hit Rate	N/A	N/A	N/A	N/A	N/A
	Contraband	N/A	N/A	N/A	N/A	N/A
	Searches	N/A	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A	N/A
	Chi2	N/A	N/A	N/A	N/A	N/A

Table G.2: Chi-Square Test of Hit-Rate by Department, Discretionary Searches (Restricted)

Department	Variable	Caucasian	Non-Caucasian	Black	Hispanic	Black or Hispanic
RISP - Scituate	Hit Rate	N/A	N/A	N/A	N/A	N/A
	Contraband	N/A	N/A	N/A	N/A	N/A
	Searches	N/A	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A	N/A
	Chi2	N/A	N/A	N/A	N/A	N/A
RISP - Wickford	Hit Rate	N/A	N/A	N/A	N/A	N/A
	Contraband	N/A	N/A	N/A	N/A	N/A
	Searches	N/A	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A	N/A
	Chi2	N/A	N/A	N/A	N/A	N/A
Scituate	Hit Rate	N/A	N/A	N/A	N/A	N/A
	Contraband	N/A	N/A	N/A	N/A	N/A
	Searches	N/A	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A	N/A
	Chi2	N/A	N/A	N/A	N/A	N/A
Smithfield	Hit Rate	N/A	N/A	N/A	N/A	N/A
	Contraband	N/A	N/A	N/A	N/A	N/A
	Searches	N/A	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A	N/A
	Chi2	N/A	N/A	N/A	N/A	N/A
South Kingstown	Hit Rate	N/A	N/A	N/A	N/A	N/A
	Contraband	N/A	N/A	N/A	N/A	N/A
	Searches	N/A	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A	N/A
	Chi2	N/A	N/A	N/A	N/A	N/A
Tiverton	Hit Rate	70.269%	N/A	N/A	N/A	N/A
	Contraband	52	N/A	N/A	N/A	N/A
	Searches	74	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A	N/A
	Chi2	N/A	N/A	N/A	N/A	N/A
Univ Of Rhode Island	Hit Rate	N/A	N/A	N/A	N/A	N/A
	Contraband	N/A	N/A	N/A	N/A	N/A
	Searches	N/A	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A	N/A
	Chi2	N/A	N/A	N/A	N/A	N/A
Warren	Hit Rate	N/A	N/A	N/A	N/A	N/A
	Contraband	N/A	N/A	N/A	N/A	N/A
	Searches	N/A	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A	N/A
	Chi2	N/A	N/A	N/A	N/A	N/A

Table G.2: Chi-Square Test of Hit-Rate by Department, Discretionary Searches (Restricted)

Department	Variable	Caucasian	Non-Caucasian	Black	Hispanic	Black or Hispanic
Warwick	Hit Rate	N/A	N/A	N/A	N/A	70.587%
	Contraband	N/A	N/A	N/A	N/A	24
	Searches	N/A	N/A	N/A	N/A	34
	P-Value	N/A	N/A	N/A	N/A	0.528
	Q-Value	N/A	N/A	N/A	N/A	0.782
	Chi2	N/A	N/A	N/A	N/A	0.397
West Greenwich	Hit Rate	N/A	N/A	N/A	N/A	N/A
	Contraband	N/A	N/A	N/A	N/A	N/A
	Searches	N/A	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A	N/A
	Chi2	N/A	N/A	N/A	N/A	N/A
West Warwick	Hit Rate	N/A	N/A	N/A	N/A	N/A
	Contraband	N/A	N/A	N/A	N/A	N/A
	Searches	N/A	N/A	N/A	N/A	N/A
	P-Value	N/A	N/A	N/A	N/A	N/A
	Q-Value	N/A	N/A	N/A	N/A	N/A
	Chi2	N/A	N/A	N/A	N/A	N/A
Westerly	Hit Rate	60%	67.123%	67.142%	68.181%	68.492%
	Contraband	33	49	47	45	50
	Searches	55	73	70	66	73
	P-Value	N/A	0.405	0.409	0.349	0.319
	Q-Value	N/A	0.782	0.782	0.782	0.782
	Chi2	N/A	0.690	0.681	0.876	0.992
Woonsocket	Hit Rate	48.863%	42.423%	45.160%	41.666%	40.789%
	Contraband	43	14	14	20	31
	Searches	88	33	31	48	76
	P-Value	N/A	0.527	0.722	0.421	0.300
	Q-Value	N/A	0.782	0.782	0.782	0.782
	Chi2	N/A	0.398	0.126	0.647	1.074