



Division of Governmental Studies and Services

WASHINGTON STATE UNIVERSITY
EXTENSION

Report to the Washington State Patrol

Research Team:

Christina Sanders, MPA, DGSS Director

Season Hoard, Ph.D.

David Makin, Ph.D.

Dale Willits, Ph.D.

Michael J. Gaffney, J.D.

Brian Anderson, M.A.

Student Research Team

Megan Bartol

Kaitlynn Boardman

Angelo Brown

Abbas Mammadov

Megan Parks

Helerv Yakub

EXECUTIVE SUMMARY

This report presents findings and observations from research conducted for the Washington State Patrol to assess traffic stop and enforcement data for evidence of biased policing. This report contains analyses of WSP contacts that occurred from January 1, 2015 through December 31, 2019. These data were provided to the Washington State University's Division of Governmental Studies and Services (DGSS) by the Washington State Patrol. DGSS researchers converted the data for analysis to examine WSP activities. For stop-level analysis, multiple internal and external "benchmark" comparisons were conducted to assess whether disproportionality is present in self-initiated contacts by WSP troopers (e.g., stops) by race and ethnicity. When examining enforcement decisions, searches, and citation/arrests in addition to comparisons hit rate analysis and multivariate analysis were conducted. Because no single method of analysis is without limitations in this research area, this study included analysis based on several widely used methods, using both internal and external data. WSP provided the following data:

- Over 7,000,000 WSP contacts from 2015 to 2019
- 3,413,482 self-initiated contacts
- 47,719 calls for service/self-initiated physical assists
- 175,579 collisions

Self-Initiated Contacts (Stops)

Based on the multiple benchmark comparisons, no evidence of systemic bias in the decision to stop exists in data analyzed between the years of 2015 through 2019. Trooper interactions were analyzed using five methods, three using data collected internally by the WSP and two using external data for comparison. None of the internal benchmark comparisons revealed disproportionality between stops and calls for service/self-initiated physical assists, day and night stops, or collisions. One of the two external comparisons showed no evidence of disproportionality, while one comparison suggests further investigation is needed to better understand actual causes for some disproportionality at the state level.

At the county-level, there was some overrepresentation of White drivers in stops in all internal and external benchmark comparisons, while Black drivers were overrepresented in King and Pierce counties and Hispanic drivers were overrepresented in Benton County compared to their proportion of the population in those locations. These counties also have high levels of commuter traffic that are not reflected by population comparisons, but which could be impacting results. Comparisons to crash data and assists reveal no disproportionality for these two groups in King, Pierce, and Benton counties. These groups were assisted by WSP troopers more than they were stopped and involved in more crashes attended by the WSP than they were stopped these counties from 2015 to 2019. Previous studies have shown crash data analysis to be a more reliable indicator than analysis based on comparison to population proportion. As indicated in what follows, there are many potential explanations for disproportionality that must be ruled out prior to an assumption of biased policing. WSU will continue to work in collaboration with the WSP to better understand any differences in stops across motorist groups at the state and county levels.

Enforcement Analysis

To determine whether evidence of bias exists in enforcement decisions, DGSS conducted analyses of searches and citations/arrests, including both descriptive and multivariate analyses. The analysis of enforcement activity produces mixed results. Hit rate analysis of high discretion searches shows that while demographic groups are searched at similar rates, the success rates of finding contraband are lower for Black and Hispanic motorists. Multivariate analysis shows that Hispanic, Native American, and Black drivers are searched at statistically higher rates, while Asian and Pacific Islander drivers are less likely to be searched than White drivers. It should be noted that across the five years of search data included in this analysis, the likelihood of being searched was consistently low, with WSP Troopers conducting searches for interactions they initiated only 3.5% of the time. In contrast, arrest citation analysis shows that Black, Native American, and Hispanic drivers receive fewer arrest citations when

controlling for numerous variables, while Asian and Pacific Islanders are more likely to receive an arrest citation than White drivers. When examining only drivers who have received a speeding violation, Black and Native American drivers are again statistically less likely to receive an arrest citation than White drivers, while there are no differences between Hispanic drivers and White drivers. Asian and Pacific Islander drivers are also statistically more likely to receive an arrest citation when examining only drivers who received a speeding violation. This report is a product of a collaborative effort with the WSP for provision of data, and close work with WSP field operations leadership to better understand data points such as location identifiers, and targeted patrols to fine tune and improve the multivariate analysis for this report. This included DGSS researchers working with the WSP to ensure that control variables, such as seriousness of offense, accurately reflect WSP practices.

INTRODUCTION

This report provides the observations and findings resulting from analysis of Washington State Patrol (WSP) traffic stop data conducted by a multi-disciplinary team of researchers associated with Washington State University's Division of Governmental Studies and Services (DGSS). This report also discusses the theoretical and practical influences and limitations of each of the types of descriptive data analyses that have been performed on WSP traffic stop data by the research team.

In the spring of 2020 DGSS was contacted by the Washington State Patrol and subsequently contracted to conduct a study of five years of WSP traffic stop data records, to include data from 2015 through 2019. A contract for the data analysis was executed in September of 2020. DGSS researchers worked closely with data management specialists at the WSP to better understand the available data and to acquire the data over the next few months. Analysis of this data, with an emphasis on close examination of any evidence of systemic biased policing or any improper racial profiling was conducted using several internal and external benchmark comparisons, consistent with the language in the scope of work. This work began in earnest in late October. An initial challenge has been to convert disparate data sets, provided by the WSP into a consistent format that supports analyses. This analysis has consisted of on the one hand, the potential role of race in traffic stops conducted by the WSP, and on the other, whether convincing evidence of disproportionate enforcement activity is present in those data. Where data was available these analyses include comparisons with the driving populations (obtained via the Census), WSP crash data and WSP calls for service/assist data. DGSS has worked closely with representatives of the WSP to identify other potential data sources and appropriate geographic-level analysis, which is discussed in more detail in this report.

DGSS has provided the services necessary to obtain raw data from WSP, convert those data to a format suitable for analysis, perform initial data evaluation and testing, and conduct a detailed data analysis to test for evidence of racial disproportionality in decisions to stop, cite and search. As a result, this report is based on separate and combined analyses, using several unique files received by DGSS from the WSP which contain traffic stop data for the calendar years of 2015 through 2019. These separate files contain more than 7,000,000 records. DGSS researchers were able to conduct several descriptive statistical assessments using these data. It is anticipated that analysis of these data will contribute to a better understanding of any areas within the WSP in which programs and training might be modified to increase the effectiveness of WSP services and can serve as a foundation for building stronger relationships between law enforcement and the communities they serve.

The Division of Governmental Studies and Services (DGSS) is a social science research and outreach unit sponsored by WSU Extension and the College of Arts and Sciences and has served Washington State University's land grant mission for over 55 years. DGSS serves as an important link that leverages the University's resources for public benefit, through applied social science research, technical assistance, and training for government and non-government organizations throughout the Pacific Northwest. As such, DGSS has developed a reputation for robust

applied research. DGSS also has extensive experience working with state and local law enforcement agencies to design and implement research efforts in support of agency goals and initiatives.

The relationship between police and communities has received national attention in the United States over the past several years from the public, the media, and academia. The most pressing issue in the study of biased traffic policing or “racial profiling” remains how to test for proportionality in police activities. This is not a simple task. It is largely dependent upon the availability of reliable data. The comparison between Census or other population demographics and the rate of police stops for minority drivers serves as an initial test for apparent disproportionality and may serve to guide further examination if disproportionality is found, but it is not sufficient to establish the existence of racial profiling. For this reason, researchers attempt to broaden the number and type of comparisons used to test for disproportionality. WSP representatives have worked collaboratively with DGSS researchers, meeting and communicating regularly on traffic stop data issues and exploring the availability of other traffic stop or crash incident-related data coded for gender, race and ethnicity of drivers which might supplement Census data for comparative analyses. Experience elsewhere has confirmed that data on the race/ethnicity of all drivers involved in crashes (not solely those at fault) provide a robust standard of comparison that most closely approximates the race/ethnicity of drivers in a jurisdiction as well as their driving behavior.

Nor is disproportionality a clear indication of bias. Each individual encounter between citizen and police is based upon many factors – many of which have little to do with race or ethnicity. If disproportionality is observed, focusing only on race and ethnicity ignores this complexity. From a rigorous scientific research perspective, any valid approach to analyzing apparent disproportionality must attempt to capture many (if not all) of the major factors leading up to and underlying individual contacts between citizens and police. Thus, in order to establish with confidence, the presence of a race/ethnic bias in police discretionary decisions, nearly all other factors bearing on such decisions should be taken into proper account as well. To support a finding of racial profiling from an observed disparity in rate of stop, all other likely causes of this disparity must be eliminated. This process of elimination should include both general contextual information (patrol patterns, the demographics of drivers on that roadway, and such other considerations as alerts for described suspects) and incident-specific information such as the time of day, the location, the officer, and the subject of the stop or other police contact. This is a difficult, time-consuming, and expensive proposition if done correctly.

THEORETICAL APPROACHES TO BIASED POLICING

Racial profiling and biased policing have received much attention beginning in the 1990’s when widespread concern over the issue led hundreds of U.S. law enforcement agencies to collect information on the race/ethnicity of individuals stopped by police officers (Mosher, Miethe and Phillips, 2002). The availability of this data has led to numerous studies examining for potential bias in law enforcement activities that use a variety of approaches due to the difficulties in definitively establishing whether disproportionality is in fact due to bias. These studies require appropriate “denominator” data for specific racial and ethnic populations, and appropriate contextual information concerning traffic stops, to distinguish biased policing from entirely appropriate, but demographically disproportionate, stop and enforcement outcomes. Multiple approaches to address these concerns include “internal benchmarking” (Walker, 2003) through comparison to other agency collected data such as calls for assistance, collisions, and veil of darkness approaches and “external benchmarking” through comparison to data collected outside of the agency, such as comparison to the Census. Despite multiple approaches to consider whether racial profiling is occurring, the use of a specific approach is determined by availability of data, number of contacts, and how that data is collected by agencies. Due to differences in data collection and contacts, the approaches that can be utilized depend on the agency in question. Numerous benchmark analyses were employed in this study to examine whether evidence exists in stop and/or enforcement decisions, including Census comparisons and internal comparisons of collisions and calls for service.

In what follows, a review of scholarly literature to date on this important topic is included. While the literature often finds evidence of disproportionality, reflecting that minority drivers are stopped, searched, cited and/or arrested more than their White counterparts, the overall literature is inconclusive on whether this disproportionality is due to racial profiling. To assist in understanding the plethora of literature that examines this issue, the following literature review is divided into three parts: (1) approaches to studying biased policing, (2) research that finds racial profiling and/or racial bias is occurring in law enforcement decisions, and (3) studies that find disproportionality, but cannot conclude definitively that it is due to racial bias.

Approaches to Studying Biased Policing and Racial Profiling

As mentioned above, scholars use multiple approaches to study for evidence of bias in law enforcement activities with debates in the literature often centering around the most appropriate “benchmarking” data to quantitatively assess whether disproportionate stop and enforcement activities are occurring. The challenge in this area of research is how best to approximate the makeup of the driving population. While these approaches use a variety of quantitative methods, they can generally be divided into two categories: internal benchmarks (which rely on data collected by the agency for comparison) and external benchmarks (data collected by external agencies or individuals for comparison).

External benchmarking typically relies on Census data to determine whether people of color are disproportionately stopped compared to their proportion of the population. While many scholarly studies and media analyses have used Census data to assess disproportionality, the limitations of Census data are well-established, including that Census data may not accurately reflect the driving population nor does it adequately capture populations at risk of being stopped by police due to reasons outside of race, such as driving behavior (See Fridell, 2004). Due to limitations of Census comparisons, scholars have sought alternative data for external benchmarks, including the use of observational road survey data (researchers record race/ethnicity of drivers at specific roadways, times, etc.). This data also has limitations as collecting it is extremely time consuming and expensive, and using this data to reflect the driving population and behavior of a larger population is problematic (See Fridell, 2004; Mosher, 2011; Ridgeway, 2009; Smith & Alpert, 2002; Tillyer, Engel, & Wooldredge, 2008; Walker, 2001).

Internal benchmarking can be a cost-effective method for determining whether people of color are disproportionately contacted by law enforcement. These methods rely on data collected by law enforcement agencies to investigate evidence of bias. For instance, comparisons to collision data (Lovrich et al., 2007; Albert, Smith and Dunham, 2004), and calls for service (Alpert Group, 2004; Lovrich et al, 2007), which allow researchers to compare contacts where the officer has discretion and “blind” contacts where the officer does not know the race or ethnicity of the person prior to making the contact (Lovrich et al., 2007).

Veil of Darkness (VOD) is another often-utilized internal benchmarking method to determine the presence of discrimination in officer stops and searches. This approach argues that race is less easily observable during darkness and examines differences in the racial composition of traffic stops in daylight relative to darkness (Grogger & Ridgeway, 2006). Therefore, if discrimination is occurring, fewer people of color should be stopped at night compared to during the day. If this decrease is statistically significant, discrimination exists. If it does not, then there is no evidence of discrimination (Grogger & Ridgeway, 2006).

Lastly, many studies focus on search outcomes to assess whether evidence of discrimination in the decision to search an individual is present. These outcome-based tests rely on the assumption that officers will maximize successful search outcomes (finding contraband) when biased policing is not occurring; thus, “hit rates” should be equal across groups (Knowles, Persico, and Todd, 2001). However, bias occurs when hit rates for people of color are significantly lower than for White individuals.

It should be noted that each approach has strengths and weaknesses, and the decision to utilize specific approaches depends upon numerous factors, including availability and quality of data and resources. More robust studies rely on both internal and external benchmarking approaches, and focus on both stops and enforcement outcomes, such as searches, resulting from stops. In what follows, more information on the wealth of research in this important area, including studies that have found evidence of discrimination and studies that have not found evidence of bias in various law enforcement activities is provided.

Studies that Find Evidence of Discrimination

Much scholarly literature finds evidence of racial profiling and bias at the national-level with findings reflecting that minority drivers are stopped and/or arrested more than White drivers due to racial bias and/or discrimination (Meehan & Ponder, 2002; Pierson, Corbett-Davies, Simoiu, Ramachandran, Goel, Overgoor, & Phillips, 2020; Ritter, 2017; Lichtenberg, 2006; Engel & Calnon, 2004; Baumgartner, Epp & Love, 2014; Carroll & Gonzalez, 2014; Dharmapala & Ross, 2004; Baumgartner, Epp, Shoub & Love 2016; & White, 2015). Further, in multiple studies focusing on national data, this finding is reoccurring (Meehan & Ponder, 2002; Pierson et al, 2020; Engel & Calnon, 2004; & White, 2015). For instance, Meehan and Ponder (2002), found that African American drivers were subjected to significant racial profiling indicated by disproportionate surveillance and stops by law enforcement when driving through areas with a majority of White residents.

Pierson, Corbett-Davies, Simoiu, Ramachandran, Goel, Overgoor and Phillips (2020) analyzed data from 2011-2015 across the United States and found that Black drivers are stopped more often than White drivers relative to their proportionality of the driving-age population. Further, after controlling for age, gender, time and location, Pierson et al. (2020) found that Black individuals and Hispanic individuals are more likely to be ticketed, searched, and arrested than White drivers. Importantly, this is consistent with the prior published work that focused on self-reports of interactions with police, including Engel and Calnon (2004) and White (2015). Engel and Calnon (2004) found that even after relevant factors were controlled for (e.g., gender, age, socio-economic status, reason for stop), self-reported surveys designed to examine individuals' interactions with the police indicate that young males of color are at the highest risk for citations, searches, arrests, and use of force during traffic stops. Yet, these drivers are not more likely to report carrying contraband. White (2015) found that darker-skinned Black individuals and Latinos are stopped and arrested more often than lighter-skinned members of the same group even when controlling for prior delinquency, using data from 1994 to 2008 National Longitudinal Study of Adolescents Health.

While numerous studies have been conducted at the national level, much research in biased policing and racial profiling occurs at the state and local levels. These studies have been conducted on specific cities and states to measure racial bias and profiling in police stops and arrests (See Ritter, 2017; Baumgartner, Epp, & Love, 2014; Baumgartner, Epp, Shoub and Love, 2016; Carroll & Gonzalez, 2014; Dharmapala & Ross, 2004; & White & Fradella, 2017). Many of these studies find evidence of bias in the decision to stop (See Albert, Smith and Dunham, 2004; Pierson et al., 2018; Taniguchi et al., 2016; Withrow, 2004b; Zingraff et al., 2003), as well as enforcement actions such as conducting searches (See Simou et al., 2017; Baumgartner, Epp, & Love, 2014; Baumgartner, Epp, Shoub and Love, 2016; Knowles, 2004; Lichtenberg, 2006).

Lastly, numerous studies using the Veil of Darkness method have found discrimination in the decision to stop individuals (Geary, 2017; Kalinowski, Ross, & Ross, 2017; Hannon, Neal, & Gustafson, 2010; Kamalu, 2016; Horrace & Rohlin 2016; Ritter 2013; Ritter 2017). Through the Veil of Darkness method, Geary (2017), analyzing data from the Philadelphia Vehicle and Pedestrian Investigations in Philadelphia between 2014 and 2017, found significant racial profiling for Black and Latino drivers. Similarly, Hannon, Neal, and Gustafson (2010) had parallel findings when analyzing data from the Philadelphia Police Department between 2015-2018; Hannon, Neal, and Gustafson (2010) conclude that the likelihood that a Black person will be stopped rises when daylight increased

with the visibility of the driver's race. Equivalent conclusions were made in Massachusetts when Kalinowski, Ross and Ross (2017) used data from the 2010 Census, United States Naval Observatory, and data from local and state police between 2001-2003 to reject the VOD test for equal treatment and demonstrate that African Americans are stopped less in darkness—creating evidence that is consistent with discrimination (Kalinowski, Ross, & Ross, 2017). Furthermore, Horrace and Rohlin (2016) found that the odds of a black driver being stopped (relative to nonblack drivers) increase 15% in daylight compared to darkness in Syracuse using logit regression of data from the 2006-2009 Syracuse Police Stop Data and the 2000 Census Tract Data.

Explanations of Racial Bias and Racial Profiling

Studies point to numerous potential explanations for disparity in law enforcement activities and racial bias in particular. Scholars have argued that implicit stereotypes and cognitive biases lead to racial bias in stops and enforcement activities, especially when quick decisions are required (Caroll and Gonzalez, 2014; Zingraff et al., 2003; Novak and Chamlin, 2012). These implicit biases occur when drivers appear “out of place” (Caroll and Gonzalez, 2014), which points to the role that neighborhood composition can play in disproportionate enforcement activities (see Novak and Chamlin, 2012; Ingram, 2007). For instance, Novak and Chamlin (2012) found evidence of discrimination towards White people in Black neighborhoods, leading to increased search rates in areas where the proportion of Black residents is higher. The authors argue that the structural characteristics of an area provide cues to officers regarding who “belongs” in that environment, and thus, social control increases among groups whose racial characteristics are inconsistent with the neighborhood racial composition.

The race and ethnicity of officers has also been linked to disproportionate stops, searches, and other enforcement activities. With studies finding that White officers were more likely to search Black drivers (Fagan and Geller, 2010; Rojek, Rosenfeld, and Decker, 2004), White officers conduct more searches than other officers (Close and Mason, 2007), and officers are more likely to conduct a search if the race of the driver is different from the officer, thereby finding evidence for preference-based discrimination (Antonovics and Knight, 2009). Additionally, Close and Mason (2007), in an analysis of the Florida Highway Patrol's Traffic Stop Data Reports, found that if the individual pulled over was African American or Latino, officers tended to feel less guilty about having suspicions with regard to the individual pulled over.

Studies Without Evidence of Racial Bias or Racial Profiling

The following section summarizes research in which researchers indicate that law enforcement had not racially discriminated against drivers. This research often finds racial disparities that are not attributable to racial discrimination. Disproportionately between racial groups and police actions is not evidence of discrimination in and of itself and can be due to other factors. Some factors that can impact racial disparities in contacts include certain racial groups being more likely to be living in areas of high police activity and high crime rates (Klinger, 1997), driving patterns (Lange, Blackman, & Johnson, 2001), and differences in offending rates (Taylor & Whitney, 1999). These factors may also lead to a disproportionate rate regarding those who are searched. For cases in which race was correlated with carrying illegal contraband, this would create an aggregate ratio of stops and searches for that particular racial group even if race was not being used as a factor in the decision making of the officer, this would create statistical discrimination (Anwar & Fang, 2006).

Tillyer and Engel (2013) found that Black male drivers were not more likely to be arrested than other drivers but did have more warnings and were less likely to receive citations. In their analysis, race alone did not explain the traffic stop disparities but when age, gender, and race were combined these variables were significant. The authors concluded that focusing on race may not be as effective as focusing on specific subgroups of the population. Lange, Johnson, & Voas (2005) used drivers who speed as a controlling factor found that the race of drivers who speed differed from those who did not speed, and that this difference was closely correlated with the racial differences among recorded police stops on the New Jersey Turnpike. The results found that Black drivers were overrepresented

in driving above the speed limit (relative to driving the speed limit or below) and the proportion of Black drivers who were speeding (exceeding 15 mph above the speed limit) “mirrored” the proportion who were stopped. This finding indicates that driving behavior may explain racial disproportionality in stops rather than discrimination. A study done on traffic stops in Riverside, California found no disparity in traffic stops and the disparities in stops by patrol and investigative units were not statistically significant (Gaines, 2006). Additionally, there were no significant differences in the percentage of people that were released during the stop, or search rates and hit rates. Gaines concluded that crime and enforcement patterns significantly impact these traffic stops. Lamberth (2006), who used red light and photo radar benchmarking data, found that there was no evidence of discrimination or racial profiling among the Metropolitan Police Department in the District of Columbia, while Vito and Walsh (2008), in a study of drivers in Louisville, Kentucky, found that officers were more likely to search and arrest known drivers, where there was pre-existing knowledge of the vehicle or the driver, when compared to unknown drivers. Known drivers were more likely to be Black, young, male, and city residents. Known drivers were more likely to be reported by the officer at the scene of having contraband in plain view during the stop and have a higher likelihood of having an odor of alcohol and or drugs compared to unknown drivers, and had higher rates of DUI's, these factors justified the increased arrest rate for the known drivers. Within the group of known and unknown drivers, there was no racial difference in officer discretion, so the authors found no evidence of discrimination (Vito & Walsh, 2008). Similarly, Higgins, Vito, and Grossi (2012) also found that known drivers were more likely to be arrested. The authors found that the racial disparities between White and Black subsamples in Louisville's traffic stops were due to the “blameworthiness” of suspects. Blameworthiness is the culpability or guilt of the driver; this was measured by the police officer reporting the vehicle having contraband in plain view or having an odor of drugs in the car. In terms of warrant checks performed and their outcomes, there were no significant differences between White and Black known drivers in either year.

Studies using the Veil of Darkness approach have also found no evidence of bias. For instance, Worden, McLean, and Wheeler (2012) found that there was no higher likelihood of African Americans in Syracuse, New York being stopped during the day than at night, while the RAND corporation found that Blacks were slightly less likely to be stopped during the daytime compared to nighttime in Oakland, California (Oakland Police Department, 2004). Similarly, Grogger and Ridgeway (2006) analyzed stop data using the VOD test with data from Oakland, California, and found that Black drivers were no more likely to be stopped during the day. Novak, (2004) who found that Black drivers were stopped more at night than during the day.

Ridgeway (2009) analyzed six years of Cincinnati Police data, from 2003 to 2008 and found no evidence of racial profiling when it came to stopping drivers. Ridgeway's use of the veil-of-darkness analysis indicated that Black drivers were less likely to be involved in a traffic stop during the day which does not show aspects of racial profiling. When analyzing stops by a particular officer, the data indicated that some officers did stop significantly more Black drivers, which may indicate that some officers were racially biased in their decision to stop. This study showed no indication of racial differences for stops that lasted longer than 30 minutes and Black drivers were slightly less likely than other drivers to receive a citation. Also, Black drivers were significantly less likely to have a high-discretion search conducted on their vehicle than a comparable non-Black driver and when Black drivers were searched, the officers had the same likelihood of finding contraband.

Additionally, Bonner and Stacey (2018) found improvement in racial disparity over time. In 2017, the authors found racial disparity was not present in traffic stops of the Darden Police Department, noting that this was the same year that the department provided additional diversity training. The previous year, there was a significantly higher odds of Black drivers being stopped during the day than at night, but the veil of darkness analysis showed no statistical significance in 2015 or 2017. The authors concluded that this department does not have a widespread disproportionate treatment of Black drivers but there is evidence of disproportionality for certain geographical segments of the city and certain periods.

Pickerill, Mosher, and Pratt (2009) found that differences in the percentages of racial minorities searched by the Washington State Patrol are not because of purposeful discrimination. The researchers found that among all races the hit rates were comparatively equal. For those who were searched, nonracial characteristics had significant effects, for example, being younger and being male increased the likelihood of being searched. Persico & Todd's (2006) used hit rate analysis finding that Blacks were searched more than Whites but had a similar hit rate of finding drugs. The researchers did not find that there was bias in the police searchers though police were more likely to search Blacks and were more likely to find drugs when searching Blacks and Hispanics. Likewise, Persico and Todd (2008) analyzed data from the police data from the Maryland State Police and found that African Americans were searched at a higher rate than Whites, but the data was consistent with the primary motivation being to increase fruitful searches, not racial profiling. The researchers used the hit rate analyses to suggest that there is no bias against African Americans since the hit rates between racial groups were not significantly different and hit rate results indicate that searches of African Americans were more successful than that of Whites. However, the hit rate result for Hispanics was much lower and may indicate a racial bias towards this group. Warren, Tomaskovic-Devey, Smith, Zingraff, and Mason, (2006) argue that it is difficult for highway patrol officers to identify the race of the driver before stopping the vehicle due to the speed of the cars on the highway and that the stops are generally initiated by using a speed detecting device.

Conclusions from Analysis of Previous Studies

Much research has been done on the examination of racial bias in law enforcement activities at multiple levels and utilizing a variety of approaches. It is important to note that disproportionality is not evidence of bias on its own and alternative explanations that may result in racial and ethnic disproportionality must be ruled out before making definitive claims of discrimination. For this study, a variety of comparisons were used, including both internal and external benchmarks, in order to present the most accurate picture feasible in assessing whether there exists any evidence of discrimination in Washington State Patrol contacts. Where appropriate, the limitations of each approach are explained to ensure the strengths and weaknesses are clear for each.

METHODOLOGY

DGSS researchers analyzed the data sets to determine whether there is evidence of bias in the decision to stop and enforcement actions taken by WSP troopers. To examine for potential bias in the decision to stop, DGSS researchers have conducted numerous internal and external benchmark comparisons, including comparisons to collision data, calls for service data, day/nighttime stops, and Census data. These comparisons have been conducted at both the state and county level and a disparity index analysis which compares stops to the driving age population (obtained from the Census) was conducted at the state-level.

For determination of whether evidence of bias exists in enforcement decisions, multi-variate ordinal regression analysis on enforcement action (whether the individual received verbal warning, written warning, citation, or arrest) was conducted. The multi-variate analysis includes examination of various independent variables which, in scholarly literature was found to impact enforcement action, to further examine the role of race on enforcement action. In addition, an analysis of searches was conducted, conducting hit rate analysis on search outcomes, to determine whether bias impacts the decision to search and multivariate analysis of search decisions.

STOP-LEVEL ANALYSIS

State-Level “Internal Benchmark” Comparisons

State-Level Analysis of Traffic Stops: Self-Initiated Contacts

In Table 1 below, descriptive figures are presented on all traffic stops initiated by the Washington State Patrol from January 1, 2015 through December 31, 2019.¹ For the purpose of this report, the term “self-initiated” is defined as a contact that was initiated by a WSP officer. Between 2015 and 2019, a total of 3,880,654 self-initiated contacts took place. Across all years, Statewide, 74.4% of those stopped by the WSP were White; 5.7% were African American, 0.6% were Native-American, 4.5% were Asian, 0.4% were Pacific Islanders, 1.8% were East Indian, 10.9% were Hispanic and 1.7% were some other race or ethnicity. The proportion of stops by race and ethnicity remain consistent across each year with only slight variations.

Table 1: Percent of State-Level WSP Trooper Self-Initiated Contacts from 2015 to 2019

	White	Black	Native American	Asian	Pacific Islander	East Indian	Hispanic	Other	Total
2015	75.90	5.20	0.70	4.50	0.30	1.50	10.60	1.20	770854
2016	75.40	5.40	0.70	4.40	0.40	1.70	10.60	1.40	660283
2017	75.10	5.70	0.50	4.40	0.40	1.80	10.20	1.80	641415
2018	74.10	5.80	0.50	4.30	0.40	1.90	11.00	1.90	625379
2019	71.60	6.20	0.50	4.70	0.40	2.10	12.00	2.50	715551
All years	74.40	5.70	0.60	4.50	0.40	1.80	10.90	1.70	3413482

Calls for Service and Self-Initiated Vehicle Assists

Calls for service and self-initiated physical assists are considered a “blind” type of benchmark because WSP Troopers are unlikely to have prior knowledge of the race of the individual being assisted in these contacts. The percentage of groups contacted by the WSP as a result of calls for service and self-initiated assists from 2015 to 2019 are provided in Table 2 below. Table 3 presents the figure obtained after subtracting the percentage of individuals contacted as a result of calls for service and vehicle assists from the percentage of all self-initiated contacts. These results suggest that no group is significantly overrepresented in self-initiated contacts versus calls for service. It appears that White individuals may be slightly overrepresented in stops compared to calls for service, while Black, Native American, Pacific Islander, and East Indian drivers may be slightly underrepresented in stops compared to calls for service. Hispanic and Asian individuals are either slightly overrepresented or underrepresented in stops from 2015 to 2019, depending upon the year.

¹ To examine self-initiated stops, the following contact types were combined: self-initiated contacts, aggressive driving contacts, road rage contacts, emphasis patrols, and distracted driving.

Table 2: Calls for Service and Self-Initiated Assists, 2015 to 2019

	White	Black	Native American	Asian	Pacific Islander	East Indian	Hispanic	Other	Total
2015	74.60%	5.90%	1.20%	4.70%	0.50%	1.80%	10.40%	1.00%	9398
2016	73.90%	6.60%	1.10%	4.90%	0.70%	1.90%	9.80%	1.10%	10080
2017	72.90%	7.20%	1.00%	4.40%	0.70%	2.00%	10.40%	1.40%	9998
2018	72.50%	6.80%	0.90%	4.20%	0.70%	2.30%	10.90%	1.50%	8459
2019	69.70%	6.70%	1.20%	4.50%	0.80%	2.50%	12.40%	2.20%	9784
All years	72.70%	6.70%	1.10%	4.60%	0.70%	2.10%	10.70%	1.50%	47719

Table 3: State-Level Self-Initiated Contacts Minus Calls for Service, 2015 to 2019

	White	Black	Native American	Asian	Pacific Islander	East Indian	Hispanic	Other
2015	1.30%	-0.70%	-0.50%	-0.20%	-0.20%	-0.30%	0.20%	0.20%
2016	1.50%	-1.20%	-0.40%	-0.50%	-0.30%	-0.20%	0.80%	0.30%
2017	2.20%	-1.50%	-0.50%	0.00%	-0.30%	-0.20%	-0.20%	0.40%
2018	1.60%	-1.00%	-0.40%	0.10%	-0.30%	-0.40%	0.10%	0.40%
2019	1.90%	-0.50%	-0.70%	0.20%	-0.40%	-0.40%	-0.40%	0.30%
All years	1.70%	-1.00%	-0.50%	-0.10%	-0.30%	-0.30%	0.20%	0.20%

Collisions

Collision data can be an effective benchmark due to its potential to capture driving behavior, both quality and quantity, that is unavailable with other benchmarks. It is also another “blind” benchmark since prior to arriving at the scene of the collision, WSP troopers are unlikely to know the race of individuals involved. Table 4 displays the percentage of population groups involved in collisions where WSP troopers responded, while Table 5 subtracts the percentage of those involved in collisions (by race and ethnicity) from self-initiated contacts. While no population groups meet the 5% threshold indicating potential significant overrepresentation, White drivers are slightly overrepresented in stops compared to their involvement in collisions, most other population groups are slightly under-represented (Black, Asian, Pacific Islanders, and Other drivers). Native American drivers are slightly over-represented from 2015 to 2017 and not over-represented in 2018 and 2019, while Hispanic drivers are slightly over-represented in 2015, but under-represented the following years.

Table 4: State-Level Collisions, 2015 to 2019

	White	Black	Native American	Asian	Pacific Islander	East Indian	Hispanic	Other	Total
2015	73.40%	6.20%	0.60%	5.80%	0.50%	1.60%	10.50%	1.50%	36009
2016	72.30%	6.50%	0.60%	5.60%	0.50%	1.70%	11.00%	1.90%	38796
2017	72.10%	6.50%	0.40%	5.50%	0.60%	1.60%	11.20%	2.10%	35730
2018	71.90%	6.70%	0.50%	5.30%	0.60%	1.70%	11.20%	2.20%	29542
2019	69.20%	7.20%	0.50%	5.60%	0.50%	1.80%	12.20%	2.90%	35502
All years	71.80%	6.60%	0.50%	5.60%	0.50%	1.70%	11.20%	2.10%	175579

Table 5: State-Level Self-Initiated Contacts Minus Collisions, 2015 to 2019

	White	Black	Native American	Asian	Pacific Islander	East Indian	Hispanic	Other
2015	2.50%	-1.00%	0.10%	-1.30%	-0.20%	-0.10%	0.10%	-0.30%
2016	3.10%	-1.10%	0.10%	-1.20%	-0.10%	0.00%	-0.40%	-0.50%
2017	3.00%	-0.80%	0.10%	-1.10%	-0.20%	0.20%	-1.00%	-0.30%
2018	2.20%	-0.90%	0.00%	-1.00%	-0.20%	0.20%	-0.20%	-0.30%
2019	2.40%	-1.00%	0.00%	-0.90%	-0.10%	0.30%	-0.20%	-0.40%
All years	2.60%	-0.90%	0.10%	-1.10%	-0.10%	0.10%	-0.30%	-0.40%

Day/Night Stops

As previously noted, one potential internal benchmark for determining whether bias is present is the “Veil of Darkness Approach” which argues that if racial profiling were occurring, it would be more likely to manifest itself in daylight hours than during night-time stops because WSP Troopers would be better able to form an impression of the race of individual drivers during daylight than when it is darker outside (See Grogger & Ridgeway, 2006). To compare these stops, a day/night variable was created by taking into consideration three separate components: contact date, contact time, and average civil twilight times in Wenatchee, Washington.² First, civil twilight times in Wenatchee were collected for each month and calculated the average civil twilight times for that month. Average civil twilights times were then rounded up or down to the nearest hour for each month using 30 minutes as the cut-off point (30 minutes and over rounded up and 29 minutes or less rounded down). For instance, average civil twilight times for December were 7:05 am to 5:27 pm. The rounded average times were then compared to contact hour to determine whether the stop occurred at day or at night.³

Table 6 below compares day and night stops statewide by year. As can be seen below, differences in day and night stops are minimal. No groups differ by 5% or more from 2015 to 2019, and for many groups the stop percentages are equal.

Table 6: Percentage of State-Level Day/Night Self-Initiated Contacts, 2015 to 2019

	White		Black		Native American		Asian		Pacific Islander		East Indian		Hispanic		Other		Total	
	D	N	D	N	D	N	D	N	D	N	D	N	D	N	D	N	D	N
2015	75.90	76.10	5.20	5.20	0.70	0.70	4.50	4.50	0.30	0.30	1.50	1.50	10.70	10.50	1.20	1.10	525868	244986
2016	75.40	75.30	5.40	5.50	0.60	0.70	4.50	4.40	0.40	0.40	1.70	1.70	10.60	10.60	1.40	1.40	454863	205420
2017	75.10	75.10	5.70	5.90	0.50	0.60	4.40	4.40	0.40	0.40	1.80	2.00	10.30	9.90	1.80	1.80	454705	186710
2018	74.00	74.40	5.80	5.70	0.50	0.50	4.40	4.20	0.40	0.40	2.00	1.80	11.00	11.00	1.90	2.00	432492	192887
2019	71.40	72.20	6.20	6.30	0.50	0.50	4.70	4.60	0.40	0.40	2.20	2.00	12.20	11.60	2.50	2.40	992418	436413
All years	73.80	74.20	5.80	5.80	0.50	0.60	4.50	4.50	0.40	0.40	1.90	1.80	11.20	10.90	1.90	1.80	2862146	1266416

² Wenatchee, WA was selected as it is nearest to the central most point in Washington State. Civil twilight times collected from www.timeanddate.com.

³ Daylight ranges by month: January (7 am to 5 pm), February (7am to 6pm), March and April (6am to 8pm), May (5am to 10pm), June and July (4am to 10pm, August (5am to 9pm), September (6am to 8pm), October (7am to 7pm) and November (6am to 5pm).

County-Level “Internal Benchmark” Comparisons

County-Level Analysis of Traffic Stops: Self-Initiated Contacts

Further analysis was conducted at the county level for self-initiated traffic stops from 2015 to 2019. While in past analyses conducted for the WSP, the data was examined at the autonomous patrol area level (APA), in discussions with WSP for this study it was discovered that while troopers are assigned to specific APA's, the contact may not actually take place in their assigned APA. Instead, WSP troopers record mile markers near their contact. In order to identify the county where a stop occurred, road and mile marker information provided by officers in the data was cross-referenced with GIS maps of Washington State provided by the WSP to determine in which county the stop occurred. Unfortunately, at times, the county where a stop occurred could not be determined due to data entry errors, such as mile markers that do not exist. This impacted approximately 20% of stops which led to fewer contacts examined at the county-level than at the state-level. Nonetheless, county-level analysis can provide important information regarding WSP activities at a more local level.

In Table 7 below, the data is presented for self-initiated traffic stops for each county from 2015-2019, except San Juan where the WSP does not patrol. Examining stop data at the county level provides greater detail in the analysis of traffic stops, as the demographic makeup of counties – and the stops within them – varies considerably.

Table 7: County-Level WSP Trooper Self-Initiated Contacts from 2015 to 2019

	White	Black	Native American	Asian	Pacific Islander	East Indian	Hispanic	Other	Total
Adams	78.2%	4.4%	0.6%	2.7%	0.2%	1.1%	12.0%	0.8%	60,170
Asotin	95.6%	0.8%	0.6%	0.4%	0.0%	0.1%	2.3%	0.1%	11,826
Benton	64.9%	2.9%	0.2%	1.4%	0.1%	0.6%	28.1%	1.8%	110,078
Chelan	76.1%	1.4%	0.2%	2.4%	0.1%	1.6%	17.9%	0.3%	51,819
Clallam	87.6%	1.6%	2.0%	3.5%	0.1%	1.2%	2.7%	1.3%	50,233
Clark	79.1%	5.1%	0.1%	3.8%	0.5%	1.4%	9.0%	1.0%	126,178
Columbia	92.4%	0.7%	0.4%	0.8%	0.0%	0.2%	5.5%	0.0%	5,062
Cowlitz	80.0%	4.5%	0.1%	4.4%	0.2%	1.8%	7.1%	1.9%	76,623
Douglas	68.0%	1.0%	0.3%	0.9%	0.1%	0.7%	28.6%	0.3%	18,604
Ferry	97.1%	0.2%	1.7%	0.1%	0.0%	0.0%	0.6%	0.3%	2,356
Franklin	56.2%	2.1%	0.1%	1.0%	0.1%	0.3%	39.6%	0.6%	37,275
Garfield	92.3%	1.0%	0.9%	1.3%	0.1%	0.2%	3.9%	0.3%	3,819
Grant	67.6%	3.3%	0.2%	2.5%	0.1%	1.1%	24.8%	0.4%	71,821
Grays Harbor	81.6%	3.6%	1.6%	3.6%	0.4%	0.8%	8.0%	0.4%	74,552
Island	84.9%	6.1%	0.1%	3.3%	0.2%	0.2%	4.8%	0.5%	41,170
Jefferson	90.5%	1.7%	0.4%	2.9%	0.2%	0.7%	2.6%	1.0%	28,894
King	62.3%	11.5%	0.2%	9.7%	0.6%	3.2%	9.4%	3.1%	505,102
Kitsap	81.1%	6.8%	0.4%	4.0%	0.6%	0.5%	5.2%	1.5%	101,235
Kittitas	74.5%	4.7%	0.4%	3.9%	0.2%	1.9%	12.6%	1.8%	136,250
Klickitat	80.1%	1.1%	2.2%	0.9%	0.1%	1.2%	14.1%	0.3%	15,187
Lewis	83.7%	3.0%	0.2%	3.5%	0.2%	1.6%	7.2%	0.6%	86,876
Lincoln	85.0%	2.7%	1.9%	1.7%	0.2%	0.7%	7.2%	0.7%	19,877
Mason	87.0%	1.9%	1.1%	1.5%	0.2%	0.3%	7.3%	0.7%	45,707
Okanogan	71.2%	1.3%	6.9%	0.7%	0.1%	0.6%	18.8%	0.6%	28,526
Pacific	91.3%	1.3%	0.1%	2.9%	0.1%	0.9%	3.1%	0.2%	41,192
Pend Oreille	93.5%	1.2%	1.1%	0.4%	0.1%	1.7%	1.9%	0.2%	7,501
Pierce	68.8%	12.7%	0.3%	5.2%	1.2%	1.5%	8.5%	1.9%	281,698
Skagit	74.6%	3.0%	0.4%	4.9%	0.2%	3.7%	11.8%	1.2%	106,297
Skamania	88.1%	0.9%	1.0%	1.1%	0.1%	0.6%	7.7%	0.4%	6,381
Snohomish	75.9%	5.1%	0.3%	6.3%	0.3%	2.1%	7.7%	2.4%	320,463
Spokane	90.4%	3.6%	0.5%	1.3%	0.2%	0.6%	2.8%	0.7%	222,500
Stevens	94.4%	0.9%	1.9%	0.4%	0.1%	0.2%	1.5%	0.5%	40,460
Thurston	77.5%	6.4%	0.4%	4.6%	0.4%	1.2%	6.7%	2.8%	150,924
Wahkiakum	95.3%	1.0%	0.1%	0.8%	0.0%	0.3%	2.3%	0.2%	5,074
Walla Walla	77.6%	1.8%	0.1%	1.0%	0.1%	0.3%	18.8%	0.3%	43,691
Whatcom	74.3%	2.8%	1.5%	6.7%	0.2%	5.5%	6.5%	2.6%	109,121
Whitman	89.1%	2.7%	0.2%	3.0%	0.1%	0.7%	3.5%	0.6%	50,906
Yakima	50.0%	1.9%	2.5%	1.2%	0.1%	0.6%	39.8%	3.9%	139,543

Calls for Service and Self-Initiated Vehicle Assists

The percentages of groups contacted by WSP through calls for service and self-initiated assists from 2015-2019 are aggregated in Table 8 below; the comparison to calls for service are displayed in Table 9 below. As indicated in Table 9, White drivers are stopped more than they are assisted by the WSP in 10 counties: Adams, Columbia, Ferry, Garfield, Grant, Klickitat, Mason, Okanogan, Wahkiakum, and Walla Walla. Hispanic motorists are stopped more than they are assisted in Franklin county. For several counties, groups are assisted more by the WSP than they are stopped.

Table 8: County-Level Calls for Service and Self-Initiated Assists, 2015 to 2019

	White	Black	Native American	Asian	Pacific Islander	East Indian	Hispanic	Other
Adams	66.7%	6.2%	0.7%	0.0%	0.0%	3.5%	22.9%	0.0%
Asotin	96.8%	0.0%	3.2%	0.0%	0.0%	0.0%	0.0%	0.0%
Benton	62.5%	2.8%	0.2%	1.1%	0.0%	0.6%	31.1%	1.6%
Chelan	74.8%	1.8%	0.3%	1.8%	0.0%	2.7%	18.5%	0.0%
Clallam	88.4%	2.0%	2.6%	2.8%	0.0%	0.2%	3.0%	0.8%
Clark	78.3%	6.6%	0.2%	2.3%	0.9%	1.6%	9.3%	0.8%
Columbia	66.7%	0.0%	0.0%	0.0%	0.0%	0.0%	25.0%	8.3%
Cowlitz	85.4%	3.8%	0.3%	1.1%	0.8%	1.9%	4.9%	1.6%
Douglas	67.5%	1.2%	0.6%	1.2%	0.0%	1.8%	27.1%	0.6%
Ferry	82.4%	0.0%	11.8%	0.0%	0.0%	0.0%	0.0%	5.9%
Franklin	64.2%	2.3%	0.0%	1.0%	0.3%	0.3%	31.5%	0.5%
Garfield	85.7%	0.0%	14.3%	0.0%	0.0%	0.0%	0.0%	0.0%
Grant	61.2%	3.4%	0.0%	0.0%	0.0%	0.8%	34.6%	0.0%
Grays Harbor	80.9%	2.7%	5.2%	1.5%	0.6%	0.0%	9.1%	0.0%
Island	87.5%	4.0%	0.1%	3.1%	0.2%	0.1%	4.8%	0.1%
Jefferson	87.9%	3.7%	1.4%	2.2%	0.0%	0.3%	3.9%	0.6%
King	60.2%	10.7%	0.3%	10.7%	1.3%	3.8%	11.0%	2.2%
Kitsap	81.1%	6.5%	0.9%	3.1%	0.8%	0.3%	5.8%	1.6%
Kittitas	75.6%	4.2%	0.8%	2.5%	0.3%	1.9%	13.0%	1.7%
Klickitat	63.6%	2.5%	15.3%	1.7%	0.0%	2.5%	12.4%	2.1%
Lewis	84.7%	4.4%	0.6%	1.7%	0.3%	0.5%	7.5%	0.4%
Lincoln	88.1%	4.8%	1.2%	0.0%	0.0%	0.0%	4.8%	1.2%
Mason	79.9%	3.1%	3.1%	0.6%	0.0%	0.3%	12.4%	0.6%
Okanogan	61.3%	4.3%	17.2%	1.1%	0.0%	2.2%	14.0%	0.0%
Pacific	89.5%	1.9%	0.0%	1.9%	1.0%	0.0%	4.8%	0.0%
Pend Oreille	94.4%	0.0%	5.6%	0.0%	0.0%	0.0%	0.0%	0.0%
Pierce	70.6%	11.6%	0.5%	4.0%	1.3%	1.2%	9.5%	1.4%
Skagit	73.0%	3.0%	1.7%	3.0%	0.1%	2.7%	15.6%	0.9%
Skamania	87.0%	1.0%	2.0%	1.0%	0.0%	1.0%	5.0%	3.0%
Snohomish	76.1%	4.8%	0.6%	3.8%	0.4%	2.0%	10.6%	1.7%
Spokane	87.8%	4.4%	1.7%	1.1%	0.5%	0.7%	3.2%	0.5%
Stevens	95.7%	0.4%	2.1%	0.4%	0.0%	0.0%	1.1%	0.4%
Thurston	75.5%	7.9%	1.0%	3.2%	0.5%	1.0%	7.5%	1.4%
Wahkiakum	87.0%	4.3%	0.0%	0.0%	0.0%	0.0%	8.7%	0.0%
Walla Walla	58.0%	1.2%	0.0%	1.2%	0.0%	0.6%	37.9%	1.2%
Whatcom	77.7%	2.5%	3.4%	3.0%	0.3%	3.6%	7.6%	1.8%
Whitman	85.9%	5.1%	0.0%	1.0%	0.0%	1.0%	6.1%	1.0%
Yakima	46.6%	1.2%	3.1%	0.8%	0.0%	2.7%	41.4%	4.2%

Table 9: County-Level Self-Initiated Contacts Minus Assists, 2015 to 2019

	White	Black	Native American	Asian	Pacific Islander	East Indian	Hispanic	Other
Adams	11.5%	-1.8%	-0.1%	2.7%	0.2%	-2.4%	-10.9%	0.8%
Asotin	-1.2%	0.8%	-2.6%	0.4%	0.0%	0.1%	2.3%	0.1%
Benton	2.4%	0.1%	0.0%	0.3%	0.1%	0.0%	-3.0%	0.2%
Chelan	1.3%	-0.4%	-0.1%	0.6%	0.1%	-1.1%	-0.6%	0.3%
Clallam	-0.8%	-0.4%	-0.6%	0.7%	0.1%	1.0%	-0.3%	0.5%
Clark	0.8%	-1.5%	-0.1%	1.5%	-0.4%	-0.2%	-0.3%	0.2%
Columbia	25.7%	0.7%	0.4%	0.8%	0.0%	0.2%	-19.5%	-8.3%
Cowlitz	-5.4%	0.7%	-0.2%	3.3%	-0.6%	-0.1%	2.2%	0.3%
Douglas	0.5%	-0.2%	-0.3%	-0.3%	0.1%	-1.1%	1.5%	-0.3%
Ferry	14.7%	0.2%	-10.1%	0.1%	0.0%	0.0%	0.6%	-5.6%
Franklin	-8.0%	-0.2%	0.1%	0.0%	-0.2%	0.0%	8.1%	0.1%
Garfield	6.6%	1.0%	-13.4%	1.3%	0.1%	0.2%	3.9%	0.3%
Grant	6.4%	-0.1%	0.2%	2.5%	0.1%	0.3%	-9.8%	0.4%
Grays Harbor	0.7%	0.9%	-3.6%	2.1%	-0.2%	0.8%	-1.1%	0.4%
Island	-2.6%	2.1%	0.0%	0.2%	0.0%	0.1%	0.0%	0.4%
Jefferson	2.6%	-2.0%	-1.0%	0.7%	0.2%	0.4%	-1.3%	0.4%
King	2.1%	0.8%	-0.1%	-1.0%	-0.7%	-0.6%	-1.6%	0.9%
Kitsap	0.0%	0.3%	-0.5%	0.9%	-0.2%	0.2%	-0.6%	-0.1%
Kittitas	-1.1%	0.5%	-0.4%	1.4%	-0.1%	0.0%	-0.4%	0.1%
Klickitat	16.5%	-1.4%	-13.1%	-0.8%	0.1%	-1.3%	1.7%	-1.8%
Lewis	-1.0%	-1.4%	-0.4%	1.8%	-0.1%	1.1%	-0.3%	0.2%
Lincoln	-3.1%	-2.1%	0.7%	1.7%	0.2%	0.7%	2.4%	-0.5%
Mason	7.1%	-1.2%	-2.0%	0.9%	0.2%	0.0%	-5.1%	0.1%
Okanogan	9.9%	-3.0%	-10.3%	-0.4%	0.1%	-1.6%	4.8%	0.6%
Pacific	1.8%	-0.6%	0.1%	1.0%	-0.9%	0.9%	-1.7%	0.2%
Pend Oreille	-0.9%	1.2%	-4.5%	0.4%	0.1%	1.7%	1.9%	0.2%
Pierce	-1.8%	1.1%	-0.2%	1.2%	-0.1%	0.3%	-1.0%	0.5%
Skagit	1.6%	0.0%	-1.3%	1.9%	0.1%	1.0%	-3.8%	0.3%
Skamania	1.1%	-0.1%	-1.0%	0.1%	0.1%	-0.4%	2.7%	-2.6%
Snohomish	-0.2%	0.3%	-0.3%	2.5%	-0.1%	0.1%	-2.9%	0.7%
Spokane	2.6%	-0.8%	-1.2%	0.2%	-0.3%	-0.1%	-0.4%	0.2%
Stevens	-1.3%	0.5%	-0.2%	0.0%	0.1%	0.2%	0.4%	0.1%
Thurston	2.0%	-1.5%	-0.6%	1.4%	-0.1%	0.2%	-0.8%	1.4%
Wahkiakum	8.3%	-3.3%	0.1%	0.8%	0.0%	0.3%	-6.4%	0.2%
Walla Walla	19.6%	0.6%	0.1%	-0.2%	0.1%	-0.3%	-19.1%	-0.9%
Whatcom	-3.4%	0.3%	-1.9%	3.7%	-0.1%	1.9%	-1.1%	0.8%
Whitman	3.2%	-2.4%	0.2%	2.0%	0.1%	-0.3%	-2.6%	-0.4%
Yakima	3.4%	0.7%	-0.6%	0.4%	0.1%	-2.1%	-1.6%	-0.3%

Collisions

Table 18 below shows the percentages for drivers involved in collisions by race/ethnicity and county; Table 10 presents the comparison of self-initiated stops and collisions by county for 2015 to 2019. White drivers were over-represented in stops compared to collisions in Adams, Columbia, Ferry, Garfield, Grant, Klickitat, Mason, Okanogan, Wahkiakum, and Walla Walla. No other groups were over-represented in stops compared to collisions.

Table 10: County-Level Collisions, 2015 to 2019

	White	Black	Native American	Asian	Pacific Islander	East Indian	Hispanic	Other
Adams	66.7%	4.5%	0.4%	1.9%	0.2%	1.2%	24.0%	1.1%
Asotin	95.7%	0.0%	1.4%	1.4%	1.4%	0.0%	0.0%	0.0%
Benton	65.2%	1.9%	0.1%	1.7%	0.1%	0.5%	28.9%	1.7%
Chelan	73.7%	1.4%	0.4%	2.7%	0.1%	1.8%	19.6%	0.3%
Clallam	87.6%	1.2%	3.7%	3.0%	0.1%	0.5%	3.1%	0.9%
Clark	81.1%	5.0%	0.1%	2.9%	0.5%	1.1%	8.9%	0.4%
Columbia	90.7%	2.8%	0.9%	0.0%	0.0%	0.0%	5.6%	0.0%
Cowlitz	85.0%	2.5%	0.1%	2.8%	0.0%	1.1%	6.5%	1.9%
Douglas	61.1%	0.6%	0.4%	0.9%	0.1%	0.8%	36.2%	0.0%
Ferry	96.7%	1.4%	0.5%	0.5%	0.0%	0.0%	0.9%	0.0%
Franklin	53.8%	1.9%	0.1%	1.3%	0.1%	0.2%	41.4%	1.1%
Garfield	85.7%	0.0%	0.0%	1.4%	0.0%	1.4%	11.4%	0.0%
Grant	61.1%	2.0%	0.2%	1.6%	0.0%	0.6%	33.8%	0.5%
Grays Harbor	82.6%	2.2%	2.9%	2.3%	0.2%	0.4%	9.0%	0.4%
Island	85.9%	4.2%	0.0%	3.4%	0.1%	0.2%	5.8%	0.5%
Jefferson	89.4%	2.2%	1.1%	3.2%	0.2%	0.7%	2.3%	1.0%
King	61.4%	10.7%	0.2%	10.2%	0.7%	3.0%	10.7%	3.0%
Kitsap	84.0%	4.7%	0.5%	3.9%	0.6%	0.3%	4.7%	1.4%
Kittitas	71.8%	5.2%	0.7%	4.0%	0.1%	1.7%	14.7%	1.7%
Klickitat	73.8%	1.9%	4.3%	1.0%	0.5%	2.1%	16.2%	0.3%
Lewis	85.9%	2.3%	0.1%	2.6%	0.3%	1.5%	6.2%	1.0%
Lincoln	80.0%	4.0%	3.8%	2.3%	0.2%	0.5%	8.3%	0.9%
Mason	86.4%	2.0%	1.6%	1.4%	0.2%	0.0%	7.5%	0.8%
Okanogan	72.6%	1.6%	4.8%	1.0%	0.0%	0.0%	19.2%	0.9%
Pacific	89.1%	0.9%	0.3%	2.1%	0.1%	0.4%	6.8%	0.3%
Pend Oreille	94.3%	1.3%	2.6%	0.8%	0.0%	0.3%	0.5%	0.3%
Pierce	72.0%	10.4%	0.2%	4.9%	1.2%	0.9%	7.9%	2.5%
Skagit	80.1%	2.3%	0.9%	2.7%	0.2%	1.9%	10.9%	1.0%
Skamania	82.1%	2.5%	1.4%	1.4%	0.4%	1.4%	9.3%	1.4%
Snohomish	75.8%	4.3%	0.3%	6.2%	0.2%	2.2%	8.8%	2.2%
Spokane	90.6%	3.2%	0.5%	1.3%	0.1%	0.6%	3.1%	0.6%
Stevens	93.8%	0.9%	2.3%	0.4%	0.3%	0.0%	1.6%	0.7%
Thurston	80.5%	4.8%	0.9%	3.8%	0.3%	0.7%	6.9%	2.1%
Wahkiakum	95.6%	0.7%	0.0%	0.7%	0.0%	0.0%	3.0%	0.0%
Walla Walla	70.2%	1.7%	0.0%	1.1%	0.1%	0.2%	25.9%	0.9%
Whatcom	79.8%	2.1%	1.7%	3.2%	0.1%	3.6%	7.3%	2.2%
Whitman	87.4%	3.2%	0.5%	2.7%	0.2%	0.6%	4.5%	0.9%
Yakima	48.1%	1.3%	1.8%	0.6%	0.2%	0.4%	43.2%	4.5%

Table 11: County-Level Self-Initiated Contacts Minus Collisions, 2015 to 2019

	White	Black	Native American	Asian	Pacific Islander	East Indian	Hispanic	Other
Adams	11.5%	-1.8%	-0.1%	2.7%	0.2%	-2.4%	-10.9%	0.8%
Asotin	-1.2%	0.8%	-2.6%	0.4%	0.0%	0.1%	2.3%	0.1%
Benton	2.4%	0.1%	0.0%	0.3%	0.1%	0.0%	-3.0%	0.2%
Chelan	1.3%	-0.4%	-0.1%	0.6%	0.1%	-1.1%	-0.6%	0.3%
Clallam	-0.8%	-0.4%	-0.6%	0.7%	0.1%	1.0%	-0.3%	0.5%
Clark	0.8%	-1.5%	-0.1%	1.5%	-0.4%	-0.2%	-0.3%	0.2%
Columbia	25.7%	0.7%	0.4%	0.8%	0.0%	0.2%	-19.5%	-8.3%
Cowlitz	-5.4%	0.7%	-0.2%	3.3%	-0.6%	-0.1%	2.2%	0.3%
Douglas	0.5%	-0.2%	-0.3%	-0.3%	0.1%	-1.1%	1.5%	-0.3%
Ferry	14.7%	0.2%	-10.1%	0.1%	0.0%	0.0%	0.6%	-5.6%
Franklin	-8.0%	-0.2%	0.1%	0.0%	-0.2%	0.0%	8.1%	0.1%
Garfield	6.6%	1.0%	-13.4%	1.3%	0.1%	0.2%	3.9%	0.3%
Grant	6.4%	-0.1%	0.2%	2.5%	0.1%	0.3%	-9.8%	0.4%
Grays Harbor	0.7%	0.9%	-3.6%	2.1%	-0.2%	0.8%	-1.1%	0.4%
Island	-2.6%	2.1%	0.0%	0.2%	0.0%	0.1%	0.0%	0.4%
Jefferson	2.6%	-2.0%	-1.0%	0.7%	0.2%	0.4%	-1.3%	0.4%
King	2.1%	0.8%	-0.1%	-1.0%	-0.7%	-0.6%	-1.6%	0.9%
Kitsap	0.0%	0.3%	-0.5%	0.9%	-0.2%	0.2%	-0.6%	-0.1%
Kittitas	-1.1%	0.5%	-0.4%	1.4%	-0.1%	0.0%	-0.4%	0.1%
Klickitat	16.5%	-1.4%	-13.1%	-0.8%	0.1%	-1.3%	1.7%	-1.8%
Lewis	-1.0%	-1.4%	-0.4%	1.8%	-0.1%	1.1%	-0.3%	0.2%
Lincoln	-3.1%	-2.1%	0.7%	1.7%	0.2%	0.7%	2.4%	-0.5%
Mason	7.1%	-1.2%	-2.0%	0.9%	0.2%	0.0%	-5.1%	0.1%
Okanogan	9.9%	-3.0%	-10.3%	-0.4%	0.1%	-1.6%	4.8%	0.6%
Pacific	1.8%	-0.6%	0.1%	1.0%	-0.9%	0.9%	-1.7%	0.2%
Pend Oreille	-0.9%	1.2%	-4.5%	0.4%	0.1%	1.7%	1.9%	0.2%
Pierce	-1.8%	1.1%	-0.2%	1.2%	-0.1%	0.3%	-1.0%	0.5%
Skagit	1.6%	0.0%	-1.3%	1.9%	0.1%	1.0%	-3.8%	0.3%
Skamania	1.1%	-0.1%	-1.0%	0.1%	0.1%	-0.4%	2.7%	-2.6%
Snohomish	-0.2%	0.3%	-0.3%	2.5%	-0.1%	0.1%	-2.9%	0.7%
Spokane	2.6%	-0.8%	-1.2%	0.2%	-0.3%	-0.1%	-0.4%	0.2%
Stevens	-1.3%	0.5%	-0.2%	0.0%	0.1%	0.2%	0.4%	0.1%
Thurston	2.0%	-1.5%	-0.6%	1.4%	-0.1%	0.2%	-0.8%	1.4%
Wahkiakum	8.3%	-3.3%	0.1%	0.8%	0.0%	0.3%	-6.4%	0.2%
Walla Walla	19.6%	0.6%	0.1%	-0.2%	0.1%	-0.3%	-19.1%	-0.9%
Whatcom	-3.4%	0.3%	-1.9%	3.7%	-0.1%	1.9%	-1.1%	0.8%
Whitman	3.2%	-2.4%	0.2%	2.0%	0.1%	-0.3%	-2.6%	-0.4%
Yakima	3.4%	0.7%	-0.6%	0.4%	0.1%	-2.1%	-1.6%	-0.3%

Day/Night Stops

Lastly, day and night stops were compared at the county-level. As stated previously, this is based on “Veil of Darkness” which assumes that if biased policing is occurring, it can only occur when officers can see motorists. Thus, discrimination in enforcement activities may be **present if certain demographic groups are stopped at significantly higher rates during the day than at night.** As with the state-level day/night comparison, if a difference of 5% or more exists between day and night stops, it is assumed that disproportionality is present. As indicated in Tables 12 through 16 below, there are no cases where day stops exceed night stops by 5% or more from 2015 to 2019 for any race or ethnic category.

Table 12: Percentage of County Day and Night Stops, 2015

	White		Black		Native American		Asian		Pacific Islander		East Indian		Hispanic		Other		Total	
	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
Adams	77.80	78.80	4.10	3.90	0.80	0.60	2.70	2.00	0.20	0.10	1.10	0.90	12.40	12.80	0.90	0.90	9660	3925
Asotin	96.50	95.70	0.40	0.50	0.70	0.40	0.30	0.50	0.10	0.00	0.00	0.10	1.90	2.60	0.10	0.10	2243	1148
Benton	67.40	68.50	2.60	2.70	0.20	0.20	1.70	1.60	0.10	0.10	0.60	0.50	27.00	26.30	0.50	0.30	17197	8734
Chelan	76.10	78.00	1.30	1.40	0.20	0.10	2.10	2.00	0.20	0.10	1.70	1.60	18.20	16.70	0.10	0.00	7990	3502
Clallam	86.90	88.80	1.50	1.80	2.40	2.20	3.90	2.70	0.10	0.00	1.00	0.40	2.50	3.00	1.90	1.20	7846	3503
Clark	81.90	82.10	4.40	4.50	0.10	0.10	3.60	3.30	0.40	0.50	1.40	1.30	7.50	7.60	0.80	0.70	168869	7219
Columbia	93.50	94.20	0.40	0.80	0.50	0.20	0.60	1.00	0.00	0.00	0.30	0.00	4.80	3.80	0.00	0.00	1108	600
Cowlitz	80.00	82.20	4.40	3.80	0.10	0.20	4.90	4.60	0.30	0.10	1.30	1.50	7.00	6.30	2.00	1.20	10029	4850
Douglas	68.40	68.70	0.70	0.90	0.20	0.80	1.10	0.70	0.00	0.10	0.80	0.90	28.50	27.50	0.20	0.40	3252	1415
Ferry	97.40	97.60	0.00	0.00	1.20	1.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.60	0.80	344	126
Franklin	59.00	62.60	2.00	2.00	0.10	0.10	1.30	0.80	0.10	0.00	0.50	0.40	36.80	34.00	0.20	0.10	5279	2746
Garfield	93.20	93.00	1.30	0.40	0.70	0.70	0.70	1.50	0.00	0.20	0.20	0.20	3.60	3.90	0.30	0.00	863	457
Grant	66.50	68.10	3.20	2.70	0.20	0.30	2.70	1.70	0.10	0.10	1.00	0.60	26.10	26.50	0.20	0.10	12218	4851
Grays Harbor	82.20	85.30	3.30	2.40	1.10	1.40	3.80	1.90	0.50	0.20	1.00	0.30	7.70	8.10	0.40	0.30	10712	4657
Island	87.00	88.40	5.40	4.70	0.20	0.10	2.70	2.20	0.20	0.10	0.20	0.10	3.40	3.10	0.80	1.30	6219	2679
Jefferson	91.00	91.10	1.60	1.50	0.50	0.40	3.00	2.30	0.30	0.20	0.70	0.50	2.00	2.90	1.00	1.10	4813	2431
King	65.00	66.10	10.90	10.50	0.20	0.20	9.60	9.60	0.50	0.50	3.00	2.90	8.80	8.30	2.00	1.90	78097	39226
Kitsap	82.60	82.70	6.60	6.6	0.40	0.20	4.00	4.10	0.60	0.80	0.40	0.20	4.40	4.40	1.00	0.90	15252	7170
Kittitas	76.50	77.60	4.30	4.40	0.40	0.40	3.90	3.80	0.20	0.10	2.00	1.70	11.30	10.90	1.40	1.20	17274	6363
Klickitat	81.30	84.20	1.10	0.60	2.20	2.10	1.00	0.70	0.10	0.00	0.60	0.40	13.80	12.00	0.00	0.10	3206	1383
Lewis	84.40	85.10	2.70	2.40	0.20	0.20	4.10	3.40	0.30	0.10	1.30	1.30	6.50	6.90	0.50	0.70	11023	6072
Lincoln	86.80	86.00	2.50	2.70	2.30	1.50	1.50	1.30	0.30	0.10	0.40	0.60	5.70	6.00	0.40	0.90	2719	894
Mason	87.90	88.90	1.50	1.60	1.20	1.00	1.70	1.20	0.10	0.00	0.30	0.10	6.70	6.60	0.60	0.60	8866	3824
Okanogan	74.30	72.00	1.20	0.80	4.70	9.50	0.60	0.40	0.10	0.10	0.60	0.70	18.00	16.30	0.50	0.30	5350	1809
Pacific	92.00	92.90	1.10	1.30	0.10	0.20	3.00	2.60	0.20	0.10	0.80	0.60	2.60	2.30	0.10	0.10	7743	2881
Pend Oreille	93.80	95.60	1.60	1.00	0.50	2.00	0.20	0.20	0.00	0.00	1.80	0.40	2.10	0.80	0.00	0.00	956	497
Pierce	71.50	72.10	11.60	11.80	0.30	0.30	5.20	5.20	1.10	0.90	1.10	0.90	7.70	7.10	1.60	1.70	49005	22703
Skagit	74.70	76.90	2.70	2.50	0.60	0.30	5.30	5.10	0.30	0.20	3.30	2.90	12.10	10.80	1.10	1.10	14790	7679
Skamania	86.00	83.50	0.70	0.40	1.60	0.90	0.30	0.00	0.00	0.00	0.90	1.70	10.30	13.40	0.30	0.00	698	231
Snohomish	78.50	78.20	4.20	4.40	0.30	0.30	6.20	6.50	0.30	0.20	1.70	1.80	6.90	6.90	1.80	1.70	49289	25747
Spokane	91.20	91.40	3.10	3.50	0.60	0.50	1.20	1.10	0.20	0.20	0.80	0.60	2.50	2.30	0.40	0.40	32212	13227
Stevens	95.10	95.00	0.80	0.60	1.60	2.10	0.40	0.40	0.10	0.00	0.20	0.20	1.50	1.40	0.30	0.30	6633	3353
Thurston	80.40	79.50	5.70	6.30	0.40	0.50	4.20	4.80	0.40	0.40	1.00	1.00	5.70	5.50	2.10	2.10	21338	10131
Wahkiakum	95.90	95.10	1.00	2.20	0.20	0.00	0.50	0.60	0.00	0.00	0.30	0.00	2.00	2.20	0.00	0.00	911	325
Walla Walla	80.70	80.90	1.30	1.40	0.00	0.10	1.00	0.60	0.10	0.10	0.20	0.40	16.30	16.20	0.50	0.30	8380	3460
Whatcom	74.70	76.20	2.60	2.30	1.10	1.10	8.10	7.90	0.10	0.20	5.10	5.30	5.70	5.10	2.60	1.90	16004	8523
Whitman	89.70	89.40	2.80	2.70	3.00	0.20	0.10	3.00	0.10	0.10	0.60	0.40	3.00	3.40	0.70	0.90	7263	3275
Yakima	49.90	48.10	1.50	1.50	4.90	4.70	1.30	1.00	0.10	0.10	0.50	0.50	41.30	43.70	0.60	0.40	24848	12111

Table 13: Percentage of County Day and Night Stops, 2016

	White		Black		Native American		Asian		Pacific Islander		East Indian		Hispanic		Other		Total	
	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
Adams	78.50	79.10	4.30	4.10	0.70	0.40	2.50	2.00	0.10	0.20	0.70	0.70	12.10	12.50	1.00	0.90	9024	3457
Asotin	94.40	95.80	1.10	0.80	0.80	1.00	0.40	0.30	0.00	0.10	0.30	0.30	2.90	1.70	0.20	0.00	1901	766
Benton	64.90	64.50	3.10	2.50	0.20	0.20	1.40	1.20	0.10	0.10	0.50	0.90	28.60	28.80	1.10	1.90	15083	6808
Chelan	74.70	76.00	1.50	0.70	0.10	0.20	2.70	2.30	0.10	0.20	1.80	1.60	18.70	18.90	0.20	0.10	6074	2614
Clallam	86.60	89.60	1.40	1.90	2.10	1.80	4.40	2.30	0.10	0.00	1.50	0.50	2.60	2.90	1.30	1.10	7822	3272
Clark	80.60	81.40	4.40	4.40	0.10	0.10	3.80	3.80	0.50	0.40	1.30	1.40	8.60	7.70	0.80	0.80	15334	6820
Columbia	91.90	95.10	0.70	0.90	0.20	0.20	0.90	0.70	0.00	0.00	0.50	0.00	5.70	3.10	0.00	0.00	579	450
Cowlitz	80.80	83.40	4.30	3.70	0.20	0.10	4.10	3.80	0.20	0.20	2.00	2.20	7.00	5.40	1.40	1.30	10191	4163
Douglas	68.10	71.00	1.00	0.80	0.40	0.30	0.70	0.50	0.30	0.00	0.70	0.30	29.70	27.10	0.00	0.00	2680	868
Ferry	97.00	96.80	0.60	0.00	1.50	3.20	0.00	0.00	0.00	0.00	0.00	0.00	0.60	0.00	0.30	0.00	337	125
Franklin	55.40	56.00	2.30	2.80	0.10	0.10	1.20	0.90	0.00	0.00	0.50	0.30	40.10	39.60	0.40	0.20	4364	2115
Garfield	92.40	92.40	0.60	1.30	0.90	1.60	2.30	0.90	0.00	0.00	0.00	0.00	3.40	3.20	0.40	0.60	701	316
Grant	66.80	66.30	3.00	3.10	0.40	0.40	2.70	1.70	0.10	0.00	1.20	0.80	25.70	27.60	0.20	0.10	9015	4216
Grays Harbor	80.80	82.80	3.80	3.50	1.60	1.70	4.10	3.00	0.50	0.20	1.00	0.50	7.90	8.20	0.30	0.20	10720	4684
Island	86.30	85.20	5.30	5.90	0.10	0.10	3.10	3.30	0.20	0.20	0.30	0.20	4.70	4.90	0.20	0.20	5195	2425
Jefferson	90.50	90.60	1.50	2.30	0.40	0.30	3.10	2.90	0.10	0.20	0.80	0.50	2.30	2.20	1.30	1.00	3741	1717
King	63.50	63.40	11.00	11.40	0.20	0.20	9.50	9.80	0.60	0.70	3.10	3.20	9.40	8.80	2.60	2.50	66975	31152
Kitsap	80.40	82.60	7.00	6.40	0.40	0.30	4.30	3.60	0.60	0.70	0.40	0.40	5.20	4.40	1.70	1.60	13093	5780
Kittitas	74.90	76.20	4.50	4.50	0.50	0.50	4.10	3.80	0.30	0.20	1.80	1.70	12.30	11.80	1.60	1.30	17811	6613
Klickitat	76.40	79.80	1.10	1.20	3.00	2.50	1.00	0.30	0.10	0.20	2.50	1.70	15.30	14.30	0.40	0.10	2437	1137
Lewis	84.00	84.90	2.70	3.00	0.20	0.20	3.50	3.30	0.30	0.20	1.80	1.60	6.80	6.30	0.60	0.60	12714	5118
Lincoln	85.80	85.20	2.50	2.60	1.90	2.60	1.40	0.90	0.00	0.20	0.30	0.50	7.40	7.00	0.70	1.10	2395	1032
Mason	87.40	87.90	2.00	1.60	1.50	1.20	1.70	1.70	0.20	0.10	6.60	0.20	6.60	6.40	0.60	0.80	7725	3773
Okanogan	71.00	71.50	1.30	0.80	8.20	10.50	0.70	0.20	0.00	0.20	0.40	0.20	17.90	16.20	0.50	0.40	4408	1748
Pacific	91.30	92.80	1.20	0.70	0.20	0.10	3.20	2.40	0.20	0.20	0.80	0.60	3.10	3.20	0.10	0.00	7023	2578
Pend Oreille	92.10	93.90	0.80	2.30	0.70	0.50	0.20	0.50	0.10	0.00	3.00	1.60	3.00	1.80	0.10	0.00	1439	435
Pierce	69.30	69.80	12.80	12.60	0.30	0.30	5.30	5.20	1.10	1.20	1.20	1.20	8.20	8.10	1.80	1.60	34567	16804
Skagit	74.90	75.50	2.50	3.00	0.40	0.40	5.20	4.80	0.30	0.30	4.20	3.80	11.20	11.20	1.30	1.10	12483	6820
Skamania	88.60	83.30	0.60	1.90	1.10	0.80	1.60	0.80	0.10	0.00	0.70	3.50	7.40	9.70	0.00	0.00	900	257
Snohomish	76.50	77.20	4.90	5.00	0.20	0.20	6.20	6.20	0.30	0.30	2.40	2.00	7.70	7.30	1.90	1.80	43053	21213
Spokane	91.40	91.10	3.20	3.30	0.50	0.50	1.10	1.10	0.20	0.10	0.50	0.70	2.50	2.40	0.50	0.70	31657	12667
Stevens	93.70	94.80	0.90	0.70	2.40	2.50	0.40	0.40	0.00	0.00	0.20	0.20	1.70	1.00	0.60	0.30	5686	2524
Thurston	79.00	78.90	6.00	5.80	0.30	0.40	4.50	4.70	0.30	0.40	1.10	1.00	6.50	6.90	2.20	1.90	23043	9849
Wahkiakum	95.90	95.40	1.10	0.60	0.00	0.00	0.80	1.70	0.10	0.00	0.40	0.00	1.70	2.30	0.00	0.00	756	348
Walla Walla	78.20	78.70	1.70	1.90	0.10	0.00	1.30	0.60	0.10	0.10	0.30	0.50	18.10	17.90	0.20	0.30	4881	2123
Whatcom	75.00	76.20	2.50	2.60	1.60	1.90	6.80	6.10	0.20	0.40	5.40	4.90	6.10	6.00	2.40	1.90	13714	6609
Whitman	89.70	89.90	2.70	2.30	0.20	0.10	3.10	3.20	0.00	0.00	0.80	0.60	2.90	3.40	0.50	0.50	6285	2168
Yakima	51.10	50.20	2.20	1.60	2.40	3.40	1.40	1.10	0.10	0.10	0.60	0.70	40.80	40.80	1.40	2.20	17410	9064

Table 14: Percentage of County Day and Night Stops, 2017

	White		Black		Native American		Asian		Pacific Islander		East Indian		Hispanic		Other		Total	
	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
Adams	78.70	80.10	4.10	4.10	0.40	0.50	3.10	2.50	0.20	0.20	1.30	0.70	11.30	11.50	1.00	0.50	8254	2568
Asotin	95.60	95.60	0.80	0.80	0.60	0.10	0.50	0.60	0.00	0.00	0.10	0.40	2.40	2.10	0.00	0.30	2246	896
Benton	65.20	63.20	3.10	2.70	0.10	0.20	1.30	1.50	0.10	0.00	0.60	0.70	26.40	27.80	3.30	3.90	14460	4611
Chelan	78.00	75.00	1.40	1.20	0.20	0.10	2.50	2.30	0.10	0.20	1.60	1.40	16.00	19.60	0.20	0.20	6442	2524
Clallam	86.70	90.40	1.90	1.70	1.70	2.00	4.00	2.40	0.10	0.10	1.60	0.70	2.70	2.20	1.20	0.50	6044	3097
Clark	80.00	79.20	4.70	5.70	0.10	0.10	3.80	0.40	0.40	0.40	1.40	1.20	8.70	8.40	0.90	1.00	19183	7843
Columbia	90.50	92.00	0.70	0.60	0.60	0.30	1.00	0.60	0.00	0.00	0.10	0.00	7.00	6.50	0.00	0.00	686	323
Cowlitz	79.40	80.80	4.80	4.00	0.10	0.20	4.40	4.50	0.40	0.20	1.70	1.90	6.90	6.50	2.20	1.90	19971	4292
Douglas	70.10	68.20	0.90	0.80	0.10	0.90	1.10	0.90	0.00	0.00	0.90	0.60	27.00	28.50	0.10	0.00	1984	847
Ferry	97.30	92.80	0.00	1.20	1.50	3.60	0.40	0.00	0.00	0.00	0.00	0.00	0.40	2.40	0.40	0.00	262	83
Franklin	58.10	56.60	1.70	2.00	0.00	0.00	0.00	0.90	0.10	0.00	0.30	0.30	38.10	39.60	0.80	0.70	5181	1738
Garfield	92.70	91.90	0.90	2.20	0.50	1.80	0.90	1.10	0.00	0.00	0.20	0.40	4.80	2.60	0.20	0.00	587	272
Grant	68.00	69.90	3.30	3.30	0.30	0.20	2.70	1.70	0.10	0.00	1.30	1.00	24.10	23.50	0.30	0.40	8180	2701
Grays Harbor	80.80	83.70	4.00	2.90	2.00	2.10	4.30	3.10	0.30	0.10	0.70	0.60	7.50	7.00	0.50	0.40	8839	4053
Island	83.10	84.20	6.80	6.60	0.10	0.00	3.60	3.60	0.20	0.20	0.30	0.30	5.60	4.70	0.30	0.40	5855	2952
Jefferson	91.30	91.60	1.60	1.80	0.40	0.30	3.00	2.50	0.20	0.00	0.70	0.40	2.20	2.50	0.70	0.80	3135	1560
King	63.30	63.10	11.20	11.90	0.20	0.10	9.40	9.50	0.70	0.60	3.00	2.80	9.20	8.90	3.10	3.00	62002	25777
Kitsap	81.70	81.90	6.70	7.10	0.30	0.30	3.50	3.80	0.60	0.60	0.40	0.30	5.20	4.50	1.60	1.40	13499	5544
Kittitas	75.20	75.60	4.50	4.40	0.40	0.30	4.40	3.50	0.30	0.20	1.80	1.90	11.80	12.50	1.50	1.50	23134	7075
Klickitat	79.70	78.40	0.80	2.20	1.70	2.50	0.80	1.00	0.20	0.00	1.20	2.30	15.00	13.50	0.60	0.10	1894	731
Lewis	84.30	85.70	3.00	3.00	0.20	0.20	3.10	3.00	0.10	0.10	1.70	1.00	7.00	6.40	0.50	0.60	12358	5073
Lincoln	86.00	85.50	2.50	2.80	2.00	2.20	2.10	1.40	0.20	0.00	0.70	0.50	6.00	6.70	0.50	0.80	2677	850
Mason	87.60	86.30	1.90	2.30	0.70	0.90	1.50	1.70	0.10	0.20	0.20	0.30	7.70	7.80	0.50	0.50	5187	2569
Okanogan	71.70	72.00	1.30	0.90	6.20	11.20	0.90	0.30	0.00	0.00	1.00	0.50	18.50	14.10	0.40	1.00	4297	1476
Pacific	90.50	92.70	1.40	1.20	0.10	0.10	3.00	2.30	0.10	0.10	1.50	0.60	3.30	3.00	0.00	0.10	4717	1890
Pend Oreille	91.70	88.50	1.90	1.20	1.10	0.60	0.50	0.90	0.00	0.30	2.60	4.30	2.20	4.00	0.10	0.30	1081	347
Pierce	68.60	68.50	12.70	12.90	0.30	0.30	5.30	5.00	1.30	1.20	1.50	1.60	8.60	8.80	1.80	1.70	38541	17470
Skagit	75.40	75.20	2.90	3.00	0.40	0.30	5.30	5.40	0.20	0.20	3.30	3.40	11.20	11.40	1.30	1.10	13822	6619
Skamania	87.40	86.00	1.60	1.40	1.50	0.30	1.10	1.40	0.10	0.00	0.40	1.00	7.40	9.60	0.40	0.30	1049	292
Snohomish	75.70	76.70	5.60	4.90	0.30	0.30	6.30	6.10	0.20	0.20	2.20	2.20	7.60	7.40	2.10	2.30	41692	18613
Spokane	89.70	90.70	3.70	3.50	0.50	0.40	1.30	1.30	0.20	0.20	0.80	0.60	3.10	2.60	0.80	0.70	31296	12022
Stevens	94.30	94.90	0.90	0.70	2.00	2.10	0.30	0.30	0.10	0.10	0.20	0.20	1.60	1.30	0.60	0.50	5150	2380
Thurston	77.90	77.70	6.10	7.10	0.40	0.40	4.80	4.80	0.30	0.20	1.10	1.40	6.70	6.20	2.80	2.20	22465	9243
Wahkiakum	94.40	92.70	1.70	0.60	0.00	0.00	1.20	1.00	0.00	0.00	0.00	1.00	2.50	3.80	0.20	1.00	517	313
Walla Walla	76.50	79.40	1.90	1.60	0.10	0.10	1.20	0.70	0.10	0.20	0.20	0.30	19.80	17.70	0.20	0.20	6441	1909
Whatcom	74.10	72.80	2.90	2.60	1.80	2.00	6.30	6.80	0.20	0.20	5.60	7.00	6.90	6.20	2.30	2.40	13591	6061
Whitman	89.20	89.20	2.50	2.50	0.20	0.40	3.20	2.50	0.10	0.00	0.70	0.60	3.30	3.60	0.80	1.00	7124	2164
Yakima	51.80	51.60	2.00	2.20	1.40	1.50	1.40	1.30	0.10	0.20	0.50	0.70	36.30	35.30	6.40	7.30	15631	7260

Table 15: Percentage of County Day and Night Stops, 2018

	White		Black		Native American		Asian		Pacific Islander		East Indian		Hispanic		Other		Total	
	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
Adams	78.40	79.30	4.70	4.50	0.40	0.50	3.00	2.60	0.40	0.10	1.40	1.20	10.80	11.30	0.90	0.60	7798	3803
Asotin	95.90	94.70	0.90	1.30	0.30	0.90	0.20	0.40	0.00	0.00	0.10	0.10	2.60	2.50	0.10	0.00	1387	753
Benton	65.30	64.80	2.70	2.90	0.10	0.20	1.40	1.30	0.00	0.00	0.60	0.60	27.70	27.70	0.60	2.50	15604	6162
Chelan	76.40	76.80	1.30	1.60	0.20	0.20	2.90	1.90	0.10	0.20	1.60	1.20	12.70	17.90	0.30	0.20	8374	3281
Clallam	87.60	89.60	1.80	1.50	1.60	2.00	3.40	2.70	0.00	0.20	1.60	0.40	2.70	2.30	1.20	1.20	6851	2961
Clark	76.90	77.30	5.60	5.40	0.10	0.10	4.00	4.20	0.60	0.30	1.60	1.60	10.00	10.00	1.20	1.00	19354	7278
Columbia	90.20	91.20	0.90	0.00	0.20	1.00	1.10	0.50	0.00	0.00	0.20	0.00	7.30	7.30	0.00	0.00	438	205
Cowlitz	79.20	81.40	4.80	4.30	0.00	0.10	4.30	3.90	0.20	0.10	1.70	1.50	7.10	6.80	2.60	2.00	8927	3939
Douglas	65.60	69.50	1.40	0.70	0.10	0.20	1.00	0.80	0.10	0.00	0.80	0.50	30.40	28.20	0.50	0.20	2953	1264
Ferry	97.10	98.30	0.00	0.00	1.30	1.70	0.00	0.00	0.00	0.00	0.00	0.00	1.30	0.00	0.30	0.00	379	117
Franklin	55.00	51.80	2.10	2.30	0.10	0.10	0.90	0.90	0.00	0.10	0.20	0.30	40.50	43.70	1.10	0.80	5535	2262
Garfield	90.80	89.90	1.70	1.80	0.90	1.80	2.30	0.90	0.00	0.00	0.00	0.90	4.00	4.60	0.30	0.00	346	109
Grant	69.50	69.70	3.90	3.00	0.20	0.10	2.70	2.00	0.10	0.20	1.30	0.90	21.70	23.80	0.60	0.40	9580	3824
Grays Harbor	81.50	82.70	3.70	3.60	1.70	1.70	3.60	3.00	0.40	0.40	0.80	0.70	8.00	7.80	0.40	0.20	9390	3515
Island	82.70	84.70	6.60	5.70	0.00	0.10	3.80	3.70	0.10	0.10	0.30	0.10	5.90	5.20	0.50	0.50	6070	3080
Jefferson	90.40	90.20	1.20	2.40	0.40	0.30	3.40	2.40	0.20	0.10	0.90	0.70	2.60	3.00	1.00	1.10	3669	1615
King	61.50	61.80	11.60	11.30	0.20	0.10	9.30	9.60	0.80	0.70	3.20	3.00	9.90	9.40	3.60	4.10	62236	27037
Kitsap	80.10	81.40	6.80	7.10	0.40	0.50	4.30	3.10	0.60	0.30	0.70	0.50	5.70	5.40	1.40	1.60	14212	6027
Kittitas	73.30	74.00	5.00	4.90	0.50	0.40	4.00	3.60	0.30	0.30	1.80	1.90	12.70	12.50	2.40	2.40	15423	6410
Klickitat	79.70	80.80	1.50	1.50	2.10	2.00	1.00	0.70	0.20	0.20	0.60	1.30	14.50	13.40	0.40	0.30	1578	614
Lewis	84.00	84.80	2.80	2.90	0.20	0.10	2.90	3.10	0.30	0.30	1.70	1.50	7.50	6.80	0.60	0.40	9361	4716
Lincoln	84.30	84.30	2.60	3.00	1.40	1.50	1.90	1.30	0.40	0.10	0.70	0.60	8.30	8.80	0.40	0.40	3200	1249
Mason	86.60	85.90	2.50	2.20	1.00	1.40	1.00	1.40	0.30	0.20	0.40	0.20	7.40	7.90	0.70	0.80	4479	2219
Okanogan	69.30	71.00	1.80	0.90	6.10	8.80	0.50	0.20	0.00	0.00	0.50	0.30	21.40	17.70	0.40	1.00	2856	1168
Pacific	90.40	92.00	1.40	1.20	0.10	0.30	3.10	2.50	0.10	0.10	1.30	0.80	3.50	3.20	0.20	0.10	4980	1899
Pend Oreille	96.00	93.70	0.90	1.10	1.60	1.10	0.50	0.20	0.10	0.00	0.00	0.20	0.60	1.60	0.30	0.20	795	446
Pierce	67.80	68.40	12.90	12.90	0.30	0.40	5.20	5.00	1.20	1.30	1.70	1.40	8.80	8.90	2.20	1.70	34516	15523
Skagit	74.00	75.60	0.30	3.30	0.40	0.50	4.80	4.80	0.20	0.20	4.20	3.60	12.30	10.90	1.00	1.10	13621	6366
Skamania	88.90	88.50	1.10	0.70	0.70	0.20	1.30	1.20	0.20	0.00	0.60	0.50	6.80	8.90	0.40	0.00	541	426
Snohomish	74.80	74.70	5.70	5.30	0.30	0.40	6.30	6.40	0.30	0.30	2.20	2.20	7.70	8.00	2.70	2.80	37218	17981
Spokane	90.00	90.10	3.80	3.90	0.40	0.30	1.40	1.40	0.20	0.20	0.60	0.50	2.90	2.90	0.70	0.80	29518	13528
Stevens	94.50	94.60	0.90	0.80	1.60	1.90	0.50	0.50	0.10	0.00	0.20	0.20	1.40	1.40	0.90	0.60	5258	2324
Thurston	75.90	76.20	6.80	7.10	0.30	0.40	4.60	4.60	0.40	0.30	1.50	1.40	7.40	6.90	3.10	2.90	17000	9019
Wahkiakum	96.10	95.30	0.20	0.40	0.40	0.00	0.40	0.80	0.40	0.00	0.00	0.00	0.00	3.10	2.80	0.40	456	257
Walla Walla	75.40	74.90	1.80	2.00	0.20	0.00	1.20	0.70	0.00	0.10	0.20	0.10	20.70	21.90	0.40	0.40	5198	2137
Whatcom	73.10	74.80	2.80	2.70	1.40	2.10	6.00	5.90	0.20	0.20	6.50	5.10	7.30	6.70	2.60	2.50	13959	6265
Whitman	88.60	88.70	2.50	2.90	0.30	0.20	3.20	2.80	0.20	0.10	0.80	0.70	4.10	4.30	0.40	0.30	8180	3118
Yakima	53.40	52.80	2.20	2.00	1.40	1.40	1.40	1.00	0.10	0.10	0.70	0.60	36.70	37.30	4.00	4.80	15427	8310

Table 16: Percentage of County Day and Night Stops, 2019

	White		Black		Native American		Asian		Pacific Islander		East Indian		Hispanic		Other		Total	
	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
Adams	76.10	77.00	5.10	4.50	0.60	0.40	3.20	2.30	0.30	0.30	1.50	1.40	12.60	13.60	0.60	0.40	16230	7132
Asotin	96.70	96.20	0.90	2.50	0.60	0.00	0.30	0.00	0.00	0.00	0.00	0.00	1.20	1.30	0.30	0.00	658	314
Benton	61.60	61.20	3.10	2.90	0.20	0.20	1.30	1.40	0.00	0.10	0.70	0.60	30.80	31.30	2.20	2.20	30952	11686
Chelan	74.90	75.30	1.60	1.00	0.20	0.20	2.50	1.80	0.10	0.10	1.80	1.90	18.40	19.20	1.50	0.50	16006	6030
Clallam	86.30	88.80	1.50	1.50	1.70	2.30	4.20	2.30	0.20	0.10	1.50	1.00	3.10	3.10	1.50	1.00	11788	5886
Clark	76.50	76.60	5.70	6.10	0.10	0.00	3.90	4.10	0.40	0.40	1.50	1.60	10.40	10.00	1.60	1.10	38650	13906
Columbia	89.50	92.80	1.90	0.00	0.00	0.30	0.90	0.60	0.00	0.00	0.60	0.60	7.10	5.20	0.00	0.60	648	698
Cowlitz	77.80	80.30	5.00	4.30	0.10	0.10	4.70	3.90	0.20	0.30	2.00	2.00	8.20	7.30	2.00	1.80	24804	11718
Douglas	65.70	68.20	1.30	1.90	0.30	0.40	0.70	1.20	0.10	0.10	0.70	0.60	30.50	27.00	0.80	0.70	4452	2230
Ferry	96.90	99.00	0.20	0.00	1.90	0.10	0.40	0.00	0.00	0.00	0.20	0.00	0.40	0.00	0.00	0.00	958	208
Franklin	52.50	55.20	2.20	2.40	0.00	0.00	1.00	1.00	0.10	0.10	0.30	0.50	43.20	40.20	0.60	0.60	11808	4302
Garfield	86.40	92.30	0.00	0.00	1.00	1.50	1.00	0.00	1.90	0.00	1.00	0.00	7.80	6.20	1.00	0.00	206	130
Grant	67.30	66.30	3.70	3.00	0.10	0.00	2.90	2.00	0.20	0.10	1.10	0.90	24.10	27.20	0.70	0.50	25302	9170
Grays Harbor	79.90	81.40	4.10	3.20	1.80	1.40	4.00	3.20	0.30	0.40	0.90	0.50	8.30	9.40	0.70	0.40	25524	10440
Island	83.70	84.50	7.20	6.80	0.10	0.00	3.20	2.90	0.30	0.00	0.20	0.30	5.00	5.30	0.30	0.20	8958	4432
Jefferson	88.40	90.60	1.90	1.70	0.50	0.80	3.40	2.30	0.30	0.10	0.80	0.70	3.40	3.00	1.30	0.80	7614	4812
King	57.80	57.70	12.60	13.00	0.20	0.20	10.30	10.30	0.70	0.50	3.90	3.90	10.50	10.10	4.10	4.30	155847	69336
Kitsap	79.10	79.90	7.00	6.70	0.40	0.40	4.30	4.30	0.50	0.50	0.50	0.50	6.30	5.70	2.00	2.10	27418	13898
Kittitas	72.50	72.20	5.00	5.00	0.30	0.30	3.60	3.50	0.20	0.20	2.20	2.20	14.20	14.40	2.00	2.20	51392	20902
Klickitat	81.10	81.20	0.90	1.20	1.20	2.20	1.40	1.20	0.00	0.00	0.80	0.40	14.10	13.40	0.50	0.40	3042	1372
Lewis	80.90	81.80	3.60	3.70	0.20	0.10	3.80	4.00	0.20	0.20	1.90	1.90	8.70	7.80	0.70	0.60	27582	13300
Lincoln	82.80	84.00	2.90	2.00	1.60	2.60	2.10	1.40	0.30	0.00	1.10	1.20	7.90	7.40	1.20	0.60	7356	2366
Mason	84.10	84.60	2.40	1.70	1.10	1.20	1.70	1.00	0.20	0.10	0.40	0.40	8.90	9.70	1.20	1.30	8920	5210
Okanogan	68.00	69.20	1.90	1.90	5.50	4.50	1.00	0.90	0.10	0.20	0.60	0.40	22.00	22.60	0.90	0.40	7716	3112
Pacific	89.60	92.20	1.70	1.20	0.10	0.10	2.90	2.10	0.30	0.10	1.10	0.60	3.70	3.60	0.70	0.20	11148	3814
Pend Oreille	94.20	97.20	1.10	0.00	1.80	0.60	0.70	0.30	0.30	0.30	0.30	0.30	1.10	0.80	0.50	0.60	2284	726
Pierce	64.80	65.60	13.80	14.10	0.30	0.30	5.30	5.00	1.30	1.40	2.30	1.80	10.00	9.50	2.20	2.30	73888	31250
Skagit	72.50	74.10	3.60	3.50	0.50	0.50	4.20	4.80	0.20	0.30	4.00	3.60	13.50	11.70	1.50	1.60	32500	15694
Skamania	90.10	90.70	0.70	0.70	0.90	0.30	1.10	1.30	0.20	0.10	0.10	0.30	5.90	5.70	1.10	0.70	2640	1334
Snohomish	73.10	73.00	5.50	5.90	0.30	0.30	6.10	6.40	0.30	0.20	2.40	2.30	8.90	8.40	3.50	3.50	88431	424429
Spokane	89.10	89.60	4.20	4.20	0.40	0.40	1.50	1.50	0.20	0.10	0.50	0.50	3.20	2.70	1.00	0.90	63500	29246
Stevens	93.70	94.40	1.20	1.00	1.70	2.00	0.50	0.70	0.10	0.00	0.30	0.20	1.90	1.30	0.60	0.40	9878	4426
Thurston	73.80	73.80	7.00	6.50	0.30	0.30	4.80	5.30	0.50	0.60	1.30	1.60	7.80	7.90	4.60	4.00	38584	19088
Wahkiakum	95.20	95.10	1.10	0.30	0.00	0.00	0.80	1.20	0.00	0.00	0.40	0.30	2.10	2.40	0.50	0.60	1706	658
Walla Walla	75.00	75.90	2.30	2.00	0.20	0.30	1.30	1.00	0.10	0.10	0.40	0.30	20.30	19.80	0.40	0.40	12762	5562
Whatcom	72.60	75.20	3.20	2.90	1.30	1.20	6.40	5.60	0.20	0.20	5.30	4.30	7.50	6.90	3.40	3.70	33672	15118
Whitman	88.60	89.10	3.20	3.20	0.30	0.30	3.10	2.70	0.20	0.10	0.80	0.50	3.60	3.60	0.30	0.30	16358	6300
Yakima	46.40	45.70	1.90	2.00	0.90	1.30	1.10	1.10	0.10	0.10	0.50	0.70	40.90	42.30	8.30	6.90	40926	18038

State-Level “External Benchmark” Comparisons

Census Comparison

Self-initiated contact rates were compared to U.S. Census Bureau data on the racial/ethnic composition of the Washington State population 15 years of age and older from 2015 to 2019 to better understand potential disproportionality in stops. As noted, Census comparisons have several limitations, as Census data does not accurately reflect the driving population especially in smaller geographic regions such as counties. Nor does Census data capture differences in driving behavior and patterns among populations at risk of being stopped by police. While Census comparisons are conducted as one level of analysis, it is important to note that Census data comparisons on their own are not evidence of bias as there is no way to control for other factors that may impact rate of stops. This report focuses on the several additional analyses of the decision to stop at the state and county-levels to investigate whether evidence of bias exists in the decision to stop, because of the limitations of Census analysis.

To conduct this comparison, racial and ethnic groups examined were adjusted to be consistent with racial and ethnic groupings by the Census (See Table 17 below). To determine whether significant disproportionality may be present, DGSS researchers examined whether stops exceed the Census population by more than 5% (See McMahan, Gardner, Davis, and Kraus, 2002). As can be seen in Table 3 below, no groups appear to be significantly overrepresented in stops using this standard when compared to Census statistics for the 15 years of age and older population. Native Americans, Asian and White drivers all appear to be underrepresented in stops compared to Census data.

Table 17: State-Level Census Statistics from 2015 to 2019 (%)

	White	Black	Native American	Asian	Native Hawaiian/ Pacific Islander	Hispanic
2015	77.08%	3.69%	1.34%	8.27%	0.62%	9.00%
2016	75.78%	3.65%	1.31%	8.33%	0.62%	10.31%
2017	75.94%	3.76%	1.23%	8.88%	0.65%	9.53%
2018	74.61%	3.73%	1.30%	8.95%	0.65%	10.76%
2019	71.06%	3.69%	1.21%	8.89%	0.64%	10.58%

*Washington State Census Statistics for population 15 and over collected from data.census.gov.

Table 18: Self-Initiated Contacts minus Census Statistics for Washington State, by Year

	White	Black	Native American	Asian	Native Hawaiian/ Pacific Islander	Hispanic
2015	-1.18%	1.51%	-0.64%	-3.77%	-0.32%	1.60%
2016	-0.38%	1.75%	-0.61%	-3.93%	-0.22%	0.29%
2017	-0.84%	1.94%	-0.73%	-4.48%	-0.25%	0.67%
2018	-0.51%	2.07%	-0.80%	-4.65%	-0.25%	0.24%
2019	-2.37%	2.36%	-0.76%	-4.55%	-0.26%	0.99%

Disparity Index Analysis

Disparity index analysis was conducted to determine whether disproportionality exists among racial and ethnic groups in the number of WSP stops as compared to the Census. The disparity index is calculated by dividing the percentage of drivers stopped by their proportion of the population. A value under 1 represents underrepresentation of the group in the number of stops; a value over 1 represents overrepresentation of the group in the number of stops.

To use the disparity index and the ratio of disparity, the denominator (i.e., census) and the numerator (i.e., stops) must match as closely as possible. In other words, the stop data population and the census data population should be similar. To do this, the stop data was adjusted to include only stops of resident drivers in the data (determined by whether the car had a Washington license plate). Of contacts where a vehicle license was recorded by a WSP trooper, 4,850,396 had Washington license plates. The disparity index analysis illustrates that White motorists are stopped at nearly the expected rate given their proportion of the population, while Native American, Asian, Native Hawaiian/Pacific Islander, and Hispanic drivers were stopped at lower rates than expected in all years. For Native American and Asian motorists, stop rates in comparison to their proportion of the population have decreased from 2015 to 2019. Black motorists are over-represented in stops compared to their proportion of the population; and this over-representation has increased slightly each year.

It is important to note that disparity index analysis is limited as it uses Census information to calculate proportions, which may not accurately reflect the driving population, especially in localized areas (See Fridell, 2004). This analysis also does not provide an explanation for why a potential disparity may exist and there may be explanations for disparities unrelated to bias.

Table 19: Disparity Index Analysis, 2015 to 2019

	White	Black	Native American	Asian	Native Hawaiian/Pacific Islander	Hispanic
2015	.983	1.44	.522	.508	.484	.133
2016	.994	1.50	.458	.504	.484	.126
2017	.992	1.54	.407	.473	.615	.136
2018	.997	1.55	.385	.458	.615	.121
2019	1.01	1.68	.413	.518	.626	.151

Notes: Population figures are based on persons 15 and older who designated a single race. Hispanics may be of any race. Stop data only includes vehicles stopped with Washington license plates. Disparity index = (proportion of stops / proportion of population).

County-Level “External Benchmark” Comparisons Census Comparison

As with the state-level analysis, county level stop data is compared to U.S. Census population data for those over the age of 15 in each county. The tables below show a comparison for each year between 2015 and 2019. As noted, however, Census comparisons are limited and are more problematic at the county-level as they may not represent the driving population in the county due to transient populations, such as commuters, students, migrant workers in farming communities, etc. Unlike the statewide level comparisons, there are several counties with apparent disproportionality (over 5% difference) in stops compared to the census population. Most notable is Adams county, where the comparison suggests that White drivers are heavily overrepresented in stops in comparison to their proportion of the population, while Hispanic drivers are underrepresented in stops in all years examined. However, Adams county is an agricultural area with seasonal employment not reflected in Census rates. Other counties show disproportionality depending on the year examined. For instance, in 2015 stops of Hispanic drivers exceeded their

proportion of the census population by more than 5% in Benton, Cowlitz, King, Kittitas, Lewis, Lincoln, Skagit, and Skamania counties, while these drivers were overrepresented in stops in only Benton county in 2016 and 2017. In terms of potential disproportionality, some counties consistently show disproportionality for Hispanic and/or Black drivers: Benton, King and Pierce counties. Although, these results should be interpreted with caution, as Pierce and King counties have heavy commuter populations which limits the accuracy of Census comparisons.

Also, DGSS researchers were notified by the WSP that in addition to heavy commuter traffic, King and Pierce counties also have numerous emphasis patrols. To examine the impact of emphasis patrols on stop rates, we attempted to separate these from self-initiated contacts and examine how this impacted proportion of stops by race and ethnicity. Emphasis patrols were determined by two methods: (1) emphasis patrols conducted based on National Highway Traffic Safety Administration priorities which are recorded separately in WSP data; and (2) Target Zero Teams that focus on statewide priority emphasis which were identified by organization IDs provided by the WSP. It is important to note that WSP gives districts and first line supervisors great latitude in determining special emphasis based on crash data, citizen complaints and other data. Unfortunately, these special foci are not recorded separately in WSP data and cannot be distinguished from other self-initiated contacts. When we removed the emphasis patrols from the data and examined proportion of self-initiated stops by race and ethnicity, it had a limited impact on overall percentages. It also did not change results of potential overrepresentation in the counties mentioned above. Thus, we provide county-level analysis with emphasis patrols combined with other self-initiated contacts. The county-level results are presented below for each year.

Table 20: County-Level Self-Initiated Contacts Minus Census Statistics 2015

	White	Black	Native American	Asian	Pacific Islander	Hispanic	Total
Adams	34.9%	3.8%	0.4%	1.6%	0.0%	-42.7%	13585
Asotin	1.9%	0.2%	-0.7%	-0.6%	-0.2%	-0.8%	3391
Benton	-10.5%	1.5%	-0.6%	-1.1%	-0.1%	9.9%	25931
Chelan	1.8%	1.0%	-1.2%	1.3%	0.0%	-4.7%	11492
Clallam	-0.9%	0.6%	-2.0%	1.9%	0.0%	-2.0%	11349
Clark	-3.1%	2.5%	-0.7%	-1.0%	-0.3%	0.5%	24088
Columbia	2.6%	0.1%	-0.3%	0.3%	-1.1%	-1.7%	1708
Cowlitz	-9.3%	3.5%	-1.0%	3.3%	0.1%	0.3%	14879
Douglas	-3.8%	0.4%	-0.5%	0.1%	0.0%	2.7%	4667
Ferry	17.4%	-0.2%	-13.7%	-0.2%	-0.6%	-3.4%	470
Franklin	12.3%	-0.6%	-0.3%	-1.2%	0.0%	-10.8%	8025
Garfield	-3.1%	1.0%	0.5%	-0.3%	0.1%	1.4%	1320
Grant	4.8%	2.2%	-1.0%	1.3%	0.0%	-8.4%	17069
Grays Harbor	-1.9%	1.7%	-2.9%	1.6%	0.0%	0.4%	15369
Island	2.1%	2.4%	-0.8%	-2.2%	-0.3%	-2.3%	8898
Jefferson	-1.5%	0.9%	-1.7%	1.2%	0.1%	-0.6%	7244
King	-5.5%	4.4%	-0.6%	-7.6%	-0.3%	4.6%	117323
Kitsap	-0.9%	4.0%	-0.9%	-1.3%	-0.2%	-2.0%	22422
Kittitas	-11.7%	3.4%	-0.6%	1.6%	0.1%	4.0%	23637
Klickitat	-4.9%	0.3%	-0.3%	0.3%	0.1%	4.0%	4589
Lewis	-5.1%	1.8%	-0.5%	2.6%	0.2%	-0.9%	17095
Lincoln	-8.2%	2.3%	1.0%	0.7%	0.0%	3.3%	3613
Mason	1.7%	0.0%	-2.0%	-0.1%	-0.1%	-0.3%	12690
Okanogan	0.2%	0.6%	-3.7%	-0.3%	-0.1%	2.2%	7159
Pacific	3.0%	0.9%	-1.3%	1.0%	-0.1%	-4.4%	10624
Pend Oreille	1.5%	1.2%	-2.5%	0.0%	-0.3%	-1.2%	1453
Pierce	-3.4%	4.6%	-0.9%	-1.5%	-0.3%	-1.1%	71708
Skagit	-5.7%	1.9%	-0.9%	3.3%	-0.3%	-2.5%	22469
Skamania	-5.8%	0.0%	-0.6%	-0.8%	-0.2%	6.1%	929
Snohomish	0.6%	1.7%	-0.7%	-3.7%	-0.2%	-1.2%	75036
Spokane	1.7%	1.4%	-0.8%	-1.2%	-0.2%	-2.0%	45439
Stevens	3.5%	0.3%	-2.8%	-0.3%	0.1%	-1.3%	9986
Thurston	-1.5%	2.8%	-1.1%	-1.6%	-0.5%	-1.3%	31469
Wahkiakum	3.5%	1.2%	-1.9%	-0.2%	0.0%	-2.8%	1236
Walla Walla	3.1%	-0.7%	-0.9%	-0.9%	0.0%	-1.3%	11840
Whatcom	-9.1%	1.7%	-1.7%	3.7%	-0.2%	-1.9%	24527
Whitman	5.9%	0.6%	-0.4%	-5.1%	-0.2%	-2.1%	10538
Yakima	-3.0%	0.6%	1.0%	0.1%	0.0%	0.3%	36959

In 2016, the comparison again shows disproportionality for White drivers in stops compared to their proportion of the population. White motorists are over-represented in five counties. Black drivers are slightly over-represented in King and Pierce Counties, while Hispanic motorists were over-represented in Benton County. In several counties, groups are under-represented in stops compared to their proportion of the population.

Table 21: County-Level Self-Initiated Contacts Minus Census Statistics, 2016

	White	Black	Native American	Asian	Pacific Islander	Hispanic	Total
Adams	36.8%	3.6%	-0.8%	1.4%	-0.2%	-42.6%	12481
Asotin	-0.1%	0.8%	-0.2%	-0.6%	0.0%	-0.3%	2667
Benton	-13.2%	1.7%	-0.6%	-1.3%	0.0%	11.3%	21991
Chelan	0.7%	0.8%	-1.2%	1.7%	0.0%	-3.8%	8688
Clallam	-0.6%	0.5%	-2.2%	2.0%	0.0%	-2.1%	11094
Clark	-4.0%	2.5%	-0.5%	-0.7%	-0.3%	1.1%	22154
Columbia	2.4%	0.3%	-0.3%	-0.1%	-0.9%	-1.8%	1029
Cowlitz	-8.4%	3.4%	-1.0%	2.7%	0.0%	-0.2%	14354
Douglas	-2.9%	0.5%	-0.4%	-0.2%	0.0%	2.3%	3548
Ferry	17.0%	0.3%	-12.9%	-0.2%	-0.5%	-3.9%	462
Franklin	8.3%	-0.2%	-0.4%	-1.1%	0.0%	-7.2%	6479
Garfield	-4.5%	0.8%	0.7%	0.9%	0.0%	1.6%	1017
Grant	4.9%	2.2%	-0.7%	1.2%	0.0%	-8.8%	13231
Grays Harbor	-3.6%	2.5%	-2.7%	2.1%	0.1%	0.5%	15404
Island	0.7%	2.7%	-0.9%	-1.5%	-0.2%	-1.2%	7620
Jefferson	-2.1%	1.1%	-1.6%	1.6%	0.0%	-0.9%	5458
King	-3.9%	5.1%	-0.5%	-7.3%	-0.1%	0.9%	98127
Kitsap	-2.6%	4.2%	-0.8%	-1.1%	-0.2%	-1.6%	18873
Kittitas	-13.1%	3.3%	-0.4%	1.9%	0.1%	4.9%	24424
Klickitat	-9.0%	0.5%	0.5%	0.0%	0.1%	5.2%	3574
Lewis	-5.3%	2.0%	-0.6%	2.3%	0.2%	-1.0%	17832
Lincoln	-9.0%	2.2%	0.6%	0.5%	-0.1%	4.6%	3427
Mason	1.3%	0.2%	-1.8%	0.1%	-0.1%	-0.5%	11498
Okanogan	-1.9%	0.6%	-0.9%	-0.4%	-0.1%	2.0%	6156
Pacific	2.6%	0.8%	-1.6%	1.3%	-0.1%	-3.9%	9601
Pend Oreille	-0.2%	1.0%	-2.7%	-0.5%	-0.3%	-0.1%	1874
Pierce	-5.5%	5.7%	-0.9%	-1.4%	-0.2%	-0.6%	51371
Skagit	-6.0%	2.0%	-1.2%	3.1%	0.0%	-3.1%	19303
Skamania	-4.0%	0.5%	-1.1%	0.5%	0.1%	2.8%	1157
Snohomish	-0.7%	2.1%	-0.8%	-4.0%	-0.2%	-0.6%	64266
Spokane	1.8%	1.5%	-0.9%	-1.3%	-0.2%	-2.0%	44324
Stevens	2.3%	0.4%	-1.8%	-0.3%	0.0%	-1.3%	8210
Thurston	-2.3%	2.8%	-1.1%	-1.5%	-0.5%	-0.5%	32892
Wahkiakum	4.5%	0.8%	-2.7%	-0.1%	0.1%	-2.8%	1104
Walla Walla	0.9%	-0.2%	-0.9%	-0.7%	-0.1%	0.3%	7004
Whatcom	-8.6%	1.6%	-1.3%	2.2%	0.0%	-1.4%	20323
Whitman	6.2%	0.6%	-0.3%	-5.3%	-0.1%	-2.4%	8453
Yakima	-0.9%	1.0%	-1.2%	0.2%	0.0%	-1.4%	26474

In 2017, White drivers were overrepresented in Ferry, Franklin, Grant, King, San Juan, Snohomish, Stevens, and Whitman Counties. Hispanic drivers were overrepresented in Benton County compared to their proportion of the population, while Black drivers were over-represented in King and Pierce counties.

Table 22: County-Level Self-Initiated Contacts Minus Census Statistics, 2017

	White	Black	Native American	Asian	Pacific Islander	Hispanic	Total
Adams	39.5%	3.5%	-1.8%	1.5%	0.2%	-41.4%	10822
Asotin	3.8%	0.7%	-1.2%	-0.4%	-0.2%	-0.6%	3142
Benton	-9.8%	1.7%	-0.7%	-1.3%	-0.1%	9.5%	19071
Chelan	4.6%	0.9%	-1.0%	1.4%	0.0%	-5.6%	8966
Clallam	5.0%	0.9%	-2.2%	1.8%	0.0%	-2.2%	9141
Clark	-1.0%	3.2%	-0.5%	-0.6%	-0.3%	1.4%	27026
Columbia	2.5%	0.1%	-0.1%	-1.0%	-0.9%	0.9%	1009
Cowlitz	-7.7%	3.8%	-1.0%	3.1%	0.1%	0.0%	16263
Douglas	-0.5%	0.5%	-0.6%	0.2%	-0.1%	1.3%	2831
Ferry	25.0%	0.2%	-10.1%	-0.1%	-0.5%	-2.7%	345
Franklin	12.5%	-0.8%	-0.7%	-1.4%	-0.1%	-7.7%	6919
Garfield	-2.0%	1.3%	0.7%	-0.8%	0.0%	2.5%	859
Grant	8.9%	2.5%	-0.9%	1.2%	0.0%	-11.0%	10881
Grays Harbor	1.6%	2.5%	-2.2%	2.3%	0.0%	0.1%	12892
Island	1.5%	4.8%	-2.4%	1.1%	-0.2%	-1.0%	8807
Jefferson	1.8%	1.1%	-1.5%	1.2%	-0.3%	-0.6%	4695
King	6.6%	6.3%	-0.4%	-5.6%	0.0%	1.9%	87779
Kitsap	2.9%	4.3%	-0.7%	-1.5%	-0.2%	-1.4%	19043
Kittitas	-10.8%	3.4%	-0.4%	2.2%	0.1%	4.7%	30209
Klickitat	-3.9%	0.9%	-0.7%	0.1%	0.1%	4.8%	2625
Lewis	-3.2%	2.3%	-0.4%	1.9%	-0.1%	-0.9%	17431
Lincoln	-6.5%	2.0%	0.7%	1.2%	-0.3%	3.3%	3527
Mason	4.5%	0.5%	-2.2%	0.0%	-0.2%	0.8%	7756
Okanogan	5.8%	0.8%	-1.3%	-0.1%	-0.1%	3.1%	5773
Pacific	4.5%	1.0%	-1.2%	1.2%	-0.3%	-4.0%	6607
Pend Oreille	2.7%	1.5%	-2.3%	-0.3%	-0.2%	-0.8%	1428
Pierce	-1.1%	6.1%	-0.8%	-1.2%	-0.1%	0.1%	56011
Skagit	-2.8%	2.2%	-1.2%	3.5%	-0.2%	-2.9%	20441
Skamania	-0.4%	1.2%	-1.0%	-0.1%	0.1%	3.0%	1341
Snohomish	6.9%	2.8%	-0.5%	-3.3%	-0.2%	-0.1%	60305
Spokane	3.5%	2.0%	-0.8%	-1.0%	-0.3%	-1.7%	43318
Stevens	7.1%	0.5%	-2.0%	-0.4%	0.1%	-1.3%	7530
Thurston	2.0%	3.4%	-1.0%	-0.9%	-0.5%	-0.5%	31708
Wahkiakum	5.5%	1.2%	-2.1%	0.1%	0.0%	-2.6%	830
Walla Walla	1.7%	0.1%	-0.8%	-0.6%	0.0%	1.7%	8350
Whatcom	-4.3%	1.9%	-0.9%	2.2%	-0.1%	-0.5%	19652
Whitman	12.9%	0.6%	-0.3%	-4.6%	-0.1%	-1.9%	9288
Yakima	3.2%	1.1%	-2.3%	0.3%	0.1%	-5.1%	22891

In 2018, Hispanic drivers were overrepresented in stops in Benton, Kittitas, and Lincoln counties. Black drivers were again slightly overrepresented in stops compared to their proportion of the population in Pierce and King Counties, while White drivers were overrepresented in Adams, Ferry, Franklin, Grant, San Juan, Wahkiakum, and Whitman counties (See Table 14 below).

Table 23: County-Level Self-Initiated Contacts Minus Census Statistics, 2018

	White	Black	Native American	Asian	Pacific Islander	Hispanic	Total
Adams	39.0%	3.9%	-2.7%	1.6%	0.3%	-44.1%	11601
Asotin	1.1%	0.9%	-0.8%	-0.7%	-0.2%	-0.5%	2140
Benton	-11.4%	1.3%	-0.6%	-1.5%	0.0%	9.4%	21766
Chelan	2.5%	0.9%	-0.7%	1.6%	0.0%	-6.0%	11655
Clallam	0.5%	0.7%	-2.5%	1.4%	0.0%	-2.6%	9812
Clark	-7.1%	3.7%	-0.5%	-0.7%	-0.3%	2.2%	26632
Columbia	0.7%	0.0%	0.4%	-1.1%	-1.1%	0.9%	643
Cowlitz	-9.2%	3.8%	-1.2%	2.9%	-0.1%	-0.1%	12866
Douglas	-3.7%	0.9%	-0.8%	0.0%	-0.2%	2.7%	4217
Ferry	16.9%	-0.2%	-12.4%	-0.6%	-0.2%	-3.8%	496
Franklin	8.2%	-0.2%	-1.0%	-1.6%	-0.1%	-6.5%	7797
Garfield	-4.1%	1.8%	0.6%	-1.5%	0.0%	2.8%	455
Grant	9.4%	2.7%	-1.1%	1.3%	0.0%	-14.1%	13404
Grays Harbor	-3.1%	2.5%	-2.6%	1.7%	0.2%	0.2%	12905
Island	-1.0%	3.5%	-0.9%	-1.1%	-0.3%	-1.0%	9150
Jefferson	-2.1%	0.7%	-1.4%	1.6%	-0.2%	-0.4%	5284
King	-4.0%	5.4%	-0.5%	-9.0%	0.0%	1.2%	89273
Kitsap	-2.6%	4.2%	-0.6%	-1.5%	-0.4%	-1.4%	20239
Kittitas	-14.4%	4.0%	-0.4%	2.0%	-0.5%	5.1%	21833
Klickitat	-6.0%	1.2%	-0.6%	0.1%	0.2%	4.0%	2192
Lewis	-4.8%	2.2%	-0.5%	1.8%	0.0%	-0.9%	14077
Lincoln	-6.9%	2.3%	-3.1%	1.0%	0.2%	5.4%	4449
Mason	2.0%	-1.3%	-1.5%	-0.3%	-0.2%	0.2%	6698
Okanogan	-2.5%	1.0%	-3.1%	-0.7%	-0.1%	4.3%	4024
Pacific	2.3%	1.0%	-1.1%	1.3%	-0.5%	-4.2%	6879
Pend Oreille	4.1%	0.8%	-2.0%	-0.8%	-0.2%	-2.7%	1241
Pierce	-5.8%	5.8%	-0.9%	-1.9%	-0.3%	-0.6%	50039
Skagit	-5.6%	2.3%	-1.3%	2.7%	0.0%	-3.1%	19987
Skamania	-2.0%	0.5%	-1.6%	-0.1%	0.0%	2.6%	967
Snohomish	-1.1%	2.6%	-0.5%	-4.7%	-0.3%	-0.9%	55199
Spokane	1.0%	2.2%	-1.0%	-1.0%	-0.2%	-2.1%	43046
Stevens	3.3%	0.4%	-2.9%	-0.2%	0.0%	-1.6%	7582
Thurston	-4.6%	3.7%	-1.0%	-1.6%	-0.5%	-0.5%	26019
Wahkiakum	5.7%	0.1%	-1.1%	-1.2%	0.0%	-3.6%	722
Walla Walla	-1.5%	-0.3%	-0.6%	-0.8%	-0.1%	2.8%	7335
Whatcom	-9.6%	1.7%	-1.2%	1.3%	-0.1%	-0.8%	20224
Whitman	6.3%	0.3%	-0.2%	-5.7%	-0.1%	-1.8%	11298
Yakima	3.0%	1.1%	-2.6%	0.3%	0.0%	-6.8%	23737

In 2019, as in all other years examined, Adams shows overrepresentation of White drivers in stops by over 30% when compared to census statistics. Hispanic drivers were overrepresented in Benton, Garfield, Kittitas, and Okanogan counties, while Black drivers were overrepresented in King and Pierce counties.

Table 24: County-Level Self-Initiated Contacts Minus Census Statistics, 2019

	White	Black	Native American	Asian	Pacific Islander	Hispanic	Total
Adams	37.7%	3.8%	-2.9%	1.9%	0.0%	-42.6%	11681
Asotin	2.3%	1.3%	-0.8%	-0.7%	-0.3%	-2.0%	486
Benton	-14.4%	1.5%	-0.6%	-1.5%	0.0%	12.2%	21319
Chelan	1.3%	0.9%	-0.9%	1.3%	0.0%	-5.1%	11018
Clallam	-0.2%	0.5%	-2.6%	1.6%	0.1%	-2.2%	8837
Clark	-7.1%	3.9%	-0.5%	-1.0%	-0.4%	2.2%	26278
Columbia	1.6%	-0.1%	-0.1%	-0.9%	-1.3%	-0.2%	673
Cowlitz	-10.3%	3.9%	-1.2%	3.1%	0.0%	0.5%	18261
Douglas	-3.6%	1.2%	-0.6%	0.0%	-0.2%	1.8%	3341
Ferry	17.0%	0.0%	-11.8%	0.0%	-0.3%	-5.1%	583
Franklin	7.8%	0.0%	-1.4%	-1.4%	-0.1%	-5.9%	8055
Garfield	-6.6%	0.0%	1.2%	-2.8%	1.2%	5.8%	168
Grant	7.3%	2.4%	-1.1%	1.5%	0.1%	-11.8%	17236
Grays Harbor	-4.6%	2.5%	-2.3%	2.1%	0.1%	0.8%	17982
Island	0.3%	4.1%	-0.9%	-2.1%	-0.2%	-1.7%	6695
Jefferson	-3.3%	1.2%	-1.2%	1.4%	0.0%	0.0%	6213
King	-7.0%	6.4%	-0.5%	-8.6%	-0.1%	1.7%	112600
Kitsap	-3.4%	4.0%	-0.6%	-1.1%	-0.4%	-1.1%	20658
Kittitas	-15.6%	4.1%	-0.4%	1.8%	-0.6%	6.4%	36147
Klickitat	-5.1%	0.5%	-0.7%	0.6%	0.0%	3.5%	2207
Lewis	-7.6%	3.0%	-0.4%	2.5%	0.0%	0.0%	20441
Lincoln	-10.4%	2.1%	0.3%	1.2%	-0.1%	4.7%	4861
Mason	-2.3%	0.7%	-1.3%	0.1%	-0.3%	1.4%	7065
Okanogan	-3.6%	1.4%	-4.6%	-0.1%	-0.2%	5.8%	5414
Pacific	2.8%	1.1%	-1.9%	0.7%	-0.1%	-4.3%	7481
Pend Oreille	4.2%	0.6%	-2.4%	-0.6%	0.2%	-2.9%	1505
Pierce	-8.0%	6.6%	-1.0%	-2.0%	-0.1%	0.2%	52569
Skagit	-6.9%	2.7%	-1.3%	2.4%	0.0%	-2.3%	24097
Skamania	-0.8%	0.6%	-1.2%	-0.1%	0.0%	0.4%	1987
Snohomish	-1.9%	2.4%	-0.6%	-5.3%	-0.3%	-0.1%	65657
Spokane	0.5%	2.5%	-0.9%	-1.0%	-0.3%	-2.2%	46373
Stevens	2.9%	0.7%	-2.8%	-0.2%	-0.1%	-1.4%	7152
Thurston	-6.7%	3.6%	-1.0%	-1.2%	-0.3%	-0.2%	28836
Wahkiakum	4.8%	0.6%	-0.7%	-1.0%	0.0%	-4.4%	1182
Walla Walla	-1.3%	0.1%	-0.5%	-0.6%	-0.1%	1.6%	9162
Whatcom	-9.7%	2.1%	-1.5%	1.6%	-0.1%	-0.9%	24395
Whitman	6.4%	0.9%	0.0%	-5.7%	0.0%	-2.5%	11329
Yakima	-3.4%	0.8%	-2.9%	0.0%	0.0%	-2.9%	29482

Conclusions Regarding Stops Based on Multiple Denominators

In terms of decision to stop, we do not find evidence of systemic bias based on the accumulation of benchmark comparisons. However, it is important to note that disparity index analysis suggests that Black motorists are overrepresented in stops compared to their proportion of the population. While Census data comparisons have several limitations, the WSP should investigate this potential overrepresentation further. At the county-level, for many of the benchmark comparisons, White drivers are overrepresented in stops each year. Black drivers are overrepresented in stops compared to their proportion of the population in King and Pierce counties each year from 2016 to 2019 but show no evidence of overrepresentation in other benchmark comparisons. Hispanic drivers are overrepresented in Benton County compared to their proportion of the population however based on the multiple comparisons conducted, we do not find evidence of systemic racial profiling or bias in the decision to stop. Many comparisons show extreme underrepresentation for groups in several counties. Overall, evidence of systemic bias in the decision to stop is not present; however, for those instances of disproportionality at the state-level and in some counties, the WSP would benefit from further study to better understand reasons for the disproportionality.

ENFORCEMENT ANALYSIS

Searches

In this section, search outcomes are analyzed for evidence of bias. The data provided to DGSS included a total of 120,184 searches conducted by WSP troopers. Similar to past studies, the data were analyzed by consolidating them into three distinct categories: *No Search*, *Low Discretion* searches and *High Discretion* searches. Low Discretion searches include the following categories: search incident to arrest, impound or inventory searches, and warrant searches. High Discretion searches include the following: consent searches, “Terry” or pat-down searches, and K-9 searches. Most searches conducted by the WSP are search incident to arrest which represents over three-fourths of all searches conducted. Search incident to arrest is also, by far, the most common low discretion search, constituting over 90% of low discretion searches. For high discretion searches, consent searches are the most common and comprise nearly 50% of the high discretion search category.

As indicated in Table 25 below, less than 3% of motorists contacted by WSP Troopers were searched between 2015 and 2019, with 2.4% percent being subjected to a low discretion search, and only 0.2% subjected to a high discretion search. It appears that both contacts and searches increased in 2019 compared to other years, but the percentage of motorists subjected to a search remained relatively consistent each year.

Table 25: Frequencies of Low and High Discretion Searches from all Observations: 2015 to 2019

	No Search	Low Discretion Search	High Discretion Search
2015	854,113 (97.6%)	19,073(2.2%)	1,567 (0.02%)
2016	744,865 (97.5%)	17,870 (2.3%)	1,664 (0.02%)
2017	714,447 (97.3%)	17,909 (2.4%)	1,664 (0.02%)
2018	684,794 (97.4%)	16,413 (2.3%)	1,682 (0.02%)
2019	1,569,207 (97.4%)	39,006 (2.4%)	3,606 (0.02%)
All Years	4,567, 426 (97.4%)	110,271 (2.4%)	9,913 (0.21%)

When examining search categories by race and ethnicity, results are similar for each group each year. Initial results indicate that Native Americans are searched at slightly higher rates than other groups. As can be seen in Tables 26 to 28 below, each year, over 0.9 percent of Native Americans contacted by the WSP were subjected to a low discretion search. In 2015 and 2017 Native Americans were subjected to a high discretion search at a rate of 1 percent or slightly higher, and nearly 1% in all other years. Overall, Non-Hispanic White motorists were subjected to low discretion searches 2.1% of the time, and high discretion searches 0.2% of the time, and this statistic remains consistent each year from 2015 to 2019. Hispanic drivers were subjected to low discretion searches 3.3 percent of the time and were subjected to high discretion searches 0.3 of a percent of the time, while African American drivers were subjected to low discretion searches 4% of the time, and to high discretion searches 0.3% of the time. It appears that Asian motorists may be searched less compared to other groups, having been subjected to low discretionary searches 1.7% of the time, and high discretion searches 0.1% of the time. Pacific Islander drivers may be subjected to low discretion searches more than other groups: 4.6% of the time they were subjected to low discretion searches, and high discretion searches 2% of the time. Lastly, it appears that East Indian drivers may also be searched less than other groups, as this group was subjected to low discretion searches .6% of the time, and to high discretion searches 0.1% of the time.

Table 26: Frequency of Searches, 2015 to 2016

	2015				2016			
	No Search	Low Discretion	High Discretion	Total	No Search	Low Discretion	High Discretion	Total
White	644,330 (97.9%)	12,704 (1.9%)	1,029 (0.2%)	658,063	555,514 (97.7%)	12,019 (2.1%)	946 (0.2%)	568,579
Black	44,387 (96.1%)	1,679 (3.6%)	145 (0.3%)	46,211	40,595 (95.8%)	1,673 (3.9%)	126 (0.3%)	42,394
Native Am.	5,294 (89.7%)	550 (9.3%)	61 (1%)	5,905	4,426 (89.8%)	443 (9.4%)	39 (0.8%)	4,728
Asian	37,161 (98.4%)	594 (1.6%)	20 (0.1%)	37,775	32,115 (98.3%)	540 (1.7%)	14 (0.00%)	32,669
Pacific Islander	2,809 (95%)	139 (4.7%)	8 (0.3%)	2,956	2,741 (95.5%)	123 (4.3%)	6 (0.2%)	2,870
East Indian	18,831 (99.2%)	141 (0.7%)	6 (0.00%)	18,978	19,028 (99.4%)	105 (0.5%)	12 (0.1%)	19,145
Hispanic	89,892 (96.4%)	3,068 (3.3%)	284 (0.3%)	93,244	78,660 (96.3%)	2,760 (3.4%)	236 (0.3%)	81,656
Other	11,011 (98.2%)	190 (1.7%)	14 (0.1%)	11,215	11,656 (98.2%)	203 (1.7%)	14 (0.1%)	11,873
Total	853,715	19,065	1,567	874,347	744,555	17,866	1,393	763,814

Table 27: Frequency of Searches, 2017 to 2018

	2017				2018			
	No Search	Low Discretion	High Discretion	Total	No Search	Low Discretion	High Discretion	Total
White	531,317 (97.6%)	12,105 (2.2%)	1,108 (0.2%)	544,530	503,630 (97.6%)	11,056 (2.1%)	1,106 (0.2%)	515,792
Black	40,623 (95.2%)	1,881 (4.4%)	167 (0.4%)	42,671	39,583 (95.7%)	1,656 (4.0%)	135 (0.3%)	41,374
Native Am.	3,342 (88.6%)	338 (10.3%)	44 (1.2%)	3,774	3,091 (89.5%)	335 (9.7%)	26 (0.8%)	3,452
Asian	30,874 (98.1%)	563 (1.8%)	26 (0.1%)	31,463	29,017 (98.3%)	463 (1.6%)	31 (0.1%)	29,511
Pacific Islander	2,601 (95.4%)	118 (4.3%)	7 (0.3%)	2,726	2,623 (94.8%)	138 (5.0%)	6 (0.2%)	2,767
East Indian	18,203 (99.3%)	119 (0.6%)	12 (0.1%)	18,334	17,336 (99.3%)	102 (0.6%)	25 (0.1%)	17,463
Hispanic	73,455 (96.4%)	2,488 (3.3%)	278 (0.4%)	76,221	75,295 (96.5%)	2,385 (3.1%)	332 (0.4%)	78,012
Other	13,731 (98.1%)	243 (1.7%)	22 (0.2%)	13,996	13,925 (97.9%)	276 (1.9%)	20 (0.1%)	14,221
Total	714,146	17,905	1,664	733,715	684,500	16,411	1,681	702,592

Table 28: Frequency of Searches, 2019 and All Years

	2019				All Years			
	No Search	Low Discretion	High Discretion	Total	No Search	Low Discretion	High Discretion	Total
White	1,111,622 (97.6%)	24,889 (2.2%)	2,492 (0.2%)	1,139,003	3,346,413 (97.7%)	72,773 (2.1%)	6,681 (0.2%)	3,425,867
Black	98,421 (95.7%)	4,131 (4.0%)	284 (0.3%)	102,836	263,609 (95.7%)	11,020 (4%)	857 (0.3%)	275,486
Native Am.	6,663 (89.8%)	685 (9.2%)	70 (0.9%)	7,418	22,636 (89.6%)	2,401 (9.5%)	240 (.9%)	25,277
Asian	72,067 (98.1%)	1,354 (1.8%)	62 (0.1%)	73,483	201,234 (98.2%)	3,514 (1.7%)	153 (0.1%)	204,901
Pacific Islander	6,048 (95.2%)	298 (4.7%)	10 (0.2%)	6,356	16,822 (95.2%)	816 (4.6%)	37 (0.2%)	17,675
East Indian	46,270 (99.3%)	296 (0.6%)	32 (0.1%)	46,598	119,668 (99.3%)	763 (0.6%)	87 (0.1%)	120,518
Hispanic	186,623 (96.3%)	6,551 (3.4%)	608 (0.3%)	193,782	503,925 (96.4%)	17,252 (3.3%)	1,738 (0.3%)	522,915
Other	40,857 (98%)	796 (1.9%)	44 (0.1%)	41,697	91,180 (98%)	1,708 (1.8%)	114 (0.1%)	93,002
Total	1,568,571	39,000	3,602	1,611,173	4,565,487	110,247	9,907	4,685,641

**percentages may not actually add up to 100 percent due to rounding errors.

Hit-Rate Tests

Search hit-rates were analyzed, which indicates the rates at which WSP troopers found contraband when conducting searches. The hit-rate test is an outcome-based test which assumes that in absence of discrimination, searches should yield contraband at equal rates across demographic groups (Knowles et al. 2001). If searches of a demographic group are less productive (e.g., rates of finding contraband are lower), then it is assumed that less probable cause is needed to search these groups and thus discrimination is occurring (Ayers, 2001). As noted by Engel (2008), these tests should be conducted on searches where law enforcement officials have a high amount of discretion as the test assumes that officers have discretion to conduct the search and many searches law enforcement conduct are mandatory (rather than driven by officer decisions). Thus, only the hit rates for high discretion searches were examined. Table 29 below shows the hit rates for each demographic group for high discretion searches. Hit rates are calculated by dividing the number of searches where contraband was found by the total number of searches. For this analysis, Asian and Pacific Islander demographic groups were combined into one category due to the low number of searches by year for these two groups. The search rates are displayed by year, but it is important to note that for many years the numbers of searches conducted on demographic groups are too small to make definitive conclusions and should be interpreted with caution. As can be seen in Table 29 below, hit rates for finding contraband are lower for Black and Hispanic motorists from 2015 to 2019 compared to White motorists. Hit rates for Native Americans are lower in 2018 and 2019 compared to White motorists. Particularly for Black and Hispanic motorists, searches were less productive (10% difference in contraband found) which may indicate that probable cause standards are lower for searches of these groups.

Table 29: Search Hit Rates, 2015 to 2019

2015	Contraband	No Contraband	Hit Rate
White	304	725	0.29543246
Black	32	113	0.22068966
Native American	16	45	0.26229508
Asian/Pacific Islander	4	24	0.14285714
East Indian	1	5	0.16666667
Hispanic	63	221	0.22183099
Other	2	12	0.14285714
Total	422	1145	0.2693044
2016			
White	310	636	0.32769556
Black	26	100	0.20634921
Native American	12	27	0.30769231
Asian/Pacific Islander	8	13	0.38095238
East Indian	2	10	0.16666667
Hispanic	53	183	0.22457627
Other	2	12	0.14285714
Total	413	980	0.29648241
2017			
White	397	711	0.35830325
Black	47	120	0.28143713
Native American	17	27	0.38636364
Asian/Pacific Islander	10	23	0.3030303
East Indian	1	11	0.08333333
Hispanic	57	221	0.20503597
Other	7	15	0.31818182
Total	536	1128	0.32211538
2018			
White	412	694	0.37251356
Black	32	103	0.23703704
Native American	8	18	0.30769231
Asian/Pacific Islander	11	26	0.2972973
East Indian	3	22	0.12
Hispanic	71	261	0.21385542
Other	5	15	0.25
Total	542	1139	0.32242713
2019			
White	906	1586	0.3635634
Black	80	204	0.28169014
Native American	20	50	0.28571429
Asian/Pacific Islander	20	52	0.27777778
East Indian	12	20	0.375
Hispanic	152	456	0.25
Other	8	36	0.18181818
Total	1198	2404	0.332593
All years			
White	2329	4352	0.34860051
Black	217	640	0.25320887
Native American	73	167	0.30416667
Asian/Pacific Islander	53	138	0.27748691
East Indian	19	68	0.2183908

Hispanic	396	1342	0.2278481
Other	24	90	0.21052632
Total	3111	6796	0.31402039

Comparing Hit Rates from 2002 to 2006

The hit rates of high discretion searches from 2015 to 2019 were compared to analyses conducted by DGSS for the WSP in 2002, 2003-2004 and 2005-2006. While hit rates are variable across the years, overall success rates have increased over time across groups. This indicates that WSP searches are more productive than they have been in the past. This could be due to a series of court decisions in Washington State that limited when law enforcement could conduct searches, and/or policy changes within the WSP that have improved searches over time, including improved implicit bias training.

Table 30: Comparison of Hit Rates from Previous Reports

	2002	2003-2004	2005-2006	2015	2016	2017	2018	2019
White	.24	.22	.18	0.29	0.326	0.35	0.37	0.36
Black	.22	.09	.15	0.22	0.20	0.28	0.23	0.28
Native American	.18	.15	.18	0.26	0.30	0.38	0.30	0.28
Asian/Pacific Islander	.22	.18	.10	0.14	0.38	0.30	0.29	0.27
East Indian	.04	.05	.11	0.16	0.16	0.08	0.12	0.37
Hispanic	.18	.15	.15	0.22	0.22	0.20	0.21	0.25
Other	0	.06	.13	0.14	0.14	0.31	0.25	0.18
Total	.23	.20	.17	0.26	0.29	0.32	0.32	0.33

Multivariate Search Analysis

Multivariate analysis of *high discretion searches* that occurred as a result of a self-initiated contact was also conducted. Because the total number of Pacific Islander and East Indian drivers searched is limited, Asian, Pacific Islander and East Indian drivers were combined and included in the Other Race category for multivariate analysis. The dependent variable is whether a high discretion search occurred (0=No Search and 1=High Discretion Search). Logistic regression was used and includes the following independent variables: number of violations, seriousness of violations, whether the stop occurred due to an emphasis patrol,⁴ whether the stop occurred at night, occurred on the interstate, driver characteristics including age, sex, and race/ethnicity, and the sex of the officer. This analysis indicates that younger drivers are more likely to be searched than older drivers, Native American, Hispanic and Black drivers are more likely to be searched than White drivers, while Asians/Pacific Islander drivers are the least likely to be searched. Based on these results, Native American drivers are 2.77 times more likely to be searched than White drivers, Hispanic drivers are 1.58 times more likely to be searched than White drivers, and Black drivers are 1.16 times more likely to be searched than White drivers. The results also indicate that the seriousness of the violations increase the likelihood of being searched. Seriousness of violations increases the likelihood of being searched 9.21 times, while the number of violations has no impact on the likelihood of being searched. If the stop involved an emphasis patrol, a search is less likely, and female drivers are less likely to be searched than male drivers. It is worth noting that the high chi-square value suggests that while still significant, our model explaining

⁴ Emphasis patrols were identified by using organization ID (for Target Zero Teams) and stops coded as an emphasis patrol contact in WSP data (contact type 9). It is important to note that APAs are granted much leeway in determining emphasis and these contacts cannot be separated in WSP data due to being coded as a self-initiated contact.

searches has fit issues. This may be due to factors that impact searches that are difficult to include in multi-variate modeling. In past reports, DGSS conducted interviews with WSP troopers regarding factors that impacted searches. Troopers cited numerous factors, such as furtive movement, speech patterns, stories not matching up between passengers and drivers and other physical indicators, that are not easily included in these models as variables which impact a decision to search. Despite these limitations, the higher likelihood of searches for Native American and Hispanic drivers is an area worth further research by the WSP.

Table 31: Logistic Regression Results of High Discretion Searches

<i>Variable</i>	<i>Coefficient (S.E.)</i>	<i>Odds Ratio</i>	<i>Z Value</i>	<i>Significance</i>
Driver Characteristics:				
Female	-0.5582 (.0314)	0.57224	-17.786	.000***
Age	-0.0270 (.0010)	0.97335	-26.639	.000***
Black	0.155194 (.0466)	1.1679	3.328	.000***
Hispanic	0.457795 (.0337)	1.5806	13.595	.000***
Native American	1.0216 (.0879)	2.7778	11.623	.000***
Asian/ Pacific Islander	-0.6606 (.0898)	0.5165	-7.353	.000***
Other Race	-0.3724 (.0906)	0.6890	-4.110	.000***
Nature of Contact:				
Number of Violations	-0.010353 (.016925)	0.9897	-0.612	.571
Violation Seriousness	2.220297 (.024416)	9.2100	90.935	.000***
Emphasis	-0.2716 (.0386)	0.7621	-7.036	.000***
Interstate	-0.031416 (.026477)	0.9691	-1.187	.235
Night	0.04578 (.027413)	1.0468	1.670	.0949
Officer Characteristics:				
Female Officer	0.1543 (.0405)	1.1669	3.813	.000***
Constant	-5.5699 (.0472)	0.00381	-177.782	.000***
$X^2=15046.13, d.f. = 13, p\text{-value} = .000$				

Analysis of Arrest Citations

Analysis of arrest citations for evidence of bias in this level of enforcement actions was conducted next. It is important to note that arrests and citations are combined in WSP data, called arrest citations, and there is no reliable method for separating the data for individuals who received a citation from those who experienced some form of arrest. Therefore, percentages in Table 32 below, represent individuals who experienced an arrest citation by WSP troopers. As indicated in Table 32, the number of arrest citations increased in 2019 (as total number of self-initiated contacts also increased). White motorists received the majority of arrest citations, but their overall proportion of arrest citations have decreased from 2015 to 2019. Hispanic motorists receive the next largest proportion of total arrest citations, receiving 10% or more of total arrest citations from 2015 to 2019. Black motorists receive 5% or more of total arrest citations from 2015 to 2019, while Native American motorists receive less than 1% of total arrest citations.

Table 32: Percent of Total Arrest Citations, 2015 to 2019

	White	Black	Native American	Asian	Pacific Islander	East Indian	Hispanic	Other	Total
2015	74.3%	5.6%	0.6%	5.1%	0.4%	1.6%	10.9%	1.5%	428,605
2016	73.3%	6%	0.7%	5%	0.4%	1.7%	11.2%	1.8%	368,872
2017	73.2%	6.2%	0.6%	5%	0.4%	1.7%	10.9%	2.2%	347,597
2018	72.7%	6.1%	0.5%	4.8%	0.4%	1.6%	11.4%	2.4%	342,417
2019	69.9%	6.6%	0.5%	5.1%	0.4%	1.9%	12.7%	3%	392,208
All Years	72.7%	6.1%	0.6%	5%	0.4%	1.7%	11.4%	2.2%	1,879,699

Table 33 below shows the percentage of each demographic group stopped by WSP troopers in a self-initiated contact that received an arrest citation. For most demographic groups, approximately 50% of self-initiated contacts resulted in an arrest citation. A higher percentage of Asian motorists stopped received an arrest citation compared to other groups, particularly in 2015, 2016, and 2018. A lower percentage of East Indian motorists received an arrest citation compared to other groups.

Table 33: Percent of Total Self-Initiated Contacts that Led to Arrest Citations, 2015 to 2019

	White	Black	Native American	Asian	Pacific Islander	East Indian	Hispanic	Other	Total
2015	49.20%	62.05%	46.00%	57.40%	53.00%	48.70%	51.30%	63.90%	386,726
2016	48.10%	52.50%	50.60%	55.50%	51.50%	45.10%	51.80%	62.00%	325,048
2017	47.00%	50.60%	51.30%	54.50%	52.40%	40.10%	50.40%	58.50%	307,875
2018	48.80%	51.20%	52.50%	55.50%	51.00%	39.60%	51.10%	61.90%	310,198
2019	48.50%	50.90%	53.90%	53.90%	49.60%	41.20%	51.90%	59.40%	353,682
All years	48.35%	51.62%	50.30%	55.39%	55.39%	42.82%	51.36%	60.82%	1,683,529

Because the WSP allows APA divisions the ability to determine their violations emphases based on local-level data, DGSS researchers examined arrest citation by APAs rather than by counties as was used in the benchmarking analysis. The total number of arrest citations across APAs will not equal the total statewide arrest citations because not all troopers who stop or cite drivers are assigned to an APA. As Table 34 below presents the percentage of arrest citations varies greatly by race and ethnicity depending on APA.

Table 34: Percentage of Arrest Citations by APA, All Years

	White	Black	Native American	Asian	Pacific Islander	East Indian	Hispanic	Other	Total
1	78.80	8.90	0.10	4.10	0.50	0.60	6.20	0.90	4260
2	60.70	16.90	0.40	6.80	1.40	0.90	9.60	3.30	57121
3	71.80	11.10	0.40	4.00	1.40	1.00	9.00	1.20	43526
4	74.40	7.10	0.60	5.30	.40	1.20	8.20	2.80	63999
5	58.90	12.70	.10	12.00	.40	3.10	9.60	3.20	60509
6	54.60	16.40	0.20	9.00	1.50	2.30	13.10	2.90	78759
7	63.50	7.20	0.10	11.40	0.20	4.50	9.30	3.90	64293
8	83.50	2.60	1.60	4.00	0.50	1.60	6.00	0.30	7952
10	78.70	3.30	1.00	4.40	.70	1.80	6.70	3.40	3516
11	50.10	2.00	2.50	1.60	0.10	0.60	39.50	3.50	32797
12	33.40	1.70	1.00	1.20	0.10	0.30	53.40	8.90	21411
13	63.60	2.50	0.10	1.30	0.10	0.40	31.20	.90	76481
14	80.20	1.70	0.30	1.10	0.10	0.30	16.00	0.40	27327
15	93.30	1.00	2.60	0.40	0.10	.10	1.40	1.00	18672
16	76.50	5.10	0.70	3.30	0.20	1.20	11.70	1.20	33141
19	90.40	3.30	0.70	1.30	0.20	0.50	2.80	0.70	103286
20	86.40	3.00	0.20	3.70	0.20	0.80	4.90	0.80	21967
21	78.40	5.60	0.10	3.80	0.50	1.10	9.50	0.90	56444
22	79.30	1.30	2.90	1.30	0.20	0.70	13.80	0.50	9639
23	77.00	4.90	0.10	5.60	0.30	1.50	7.40	3.10	31823
24	76.80	4.60	0.20	5.50	0.40	2.10	9.40	0.90	22879
25	72.10	1.40	0.30	2.80	0.10	1.70	21.20	0.30	34250
26	71.60	5.00	0.50	4.90	0.30	1.80	14.00	1.90	54294
27	7.00	1.40	5.40	.90	0.10	0.70	20.80	0.70	13076
28	63.40	3.90	0.30	3.00	0.10	1.00	27.80	0.50	37729
30	70.30	2.60	2.00	9.50	0.20	4.80	7.50	3.10	49656
31	71.50	2.80	0.60	6.50	0.30	3.20	13.40	1.70	55159
32	85.30	5.70	0.10	2.90	0.10	0.30	5.10	0.50	25530
33	71.20	5.80	0.40	8.10	0.30	2.50	8.50	3.10	104750
34	80.80	2.90	0.20	4.00	0.20	1.00	8.60	2.30	41620
35	86.70	1.90	1.60	4.20	0.10	1.30	2.80	1.40	37562
36	79.80	7.60	0.40	4.10	0.60	0.30	5.50	1.70	52483
37	79.60	3.90	2.10	4.20	0.40	0.90	8.40	0.40	46301
38	84.20	2.00	1.60	1.60	0.10	0.20	9.10	1.10	20782
39	90.70	1.30	0.10	3.10	0.20	1.10	3.20	0.30	28287
40	88.10	1.60	0.40	2.30	0.20	.90	6.30	0.20	14964

The average number of violations by race and ethnicity at the state and APA levels were also examined. It is important to note that the WSP has over 200 separate violation codes. In the process of data combining and cleaning, these 200+ violations were combined into 34 categories, such as DUI, Hit and Run, and so on. To estimate the average number of violations, we summed the 34 violation categories and then calculated the mean. As indicated in Table 35 below, the average number of violations differs slightly across groups as has been the case in previous reports. However, the average serious violation score also differs across groups.

Table 35: Statewide Average Violations, 2015 to 2019

	White	Black	Native American	Asian	Pacific Islander	East Indian	Hispanic	Other
2015	1.36	1.53	1.64	1.32	1.58	1.31	1.50	1.39
2016	1.36	1.54	1.62	1.31	1.56	1.30	1.49	1.39
2017	1.35	1.52	1.65	1.29	1.58	1.29	1.46	1.38
2018	1.33	1.50	1.60	1.28	1.58	1.28	1.45	1.36
2019	1.33	1.48	1.59	1.27	1.48	1.28	1.44	1.32
All years	1.35	1.51	1.62	1.30	1.55	1.29	1.47	1.36

The average serious violation score statewide is included in Table 36 below. To calculate seriousness of offense, the following offenses were combined: felony drugs, misdemeanor drugs, DUI (all forms), felony flight/elude, felony warrant, misdemeanor warrant, hit and run/revocation, negligent driving (1st and 2nd degree), reckless driving, vehicular assault, physical assault (felony and misdemeanor), and domestic violence (felony and misdemeanor). Each of these offenses were coded “one” if present and “zero” if absent, then summed across these 14 offense categories (with a resulting possible score ranging from zero to fourteen). The mean seriousness offence by race and ethnicity was then analyzed. The average seriousness score varies with the lowest seriousness score for East Indian drivers, followed by Asian drivers, White drivers, Other drivers, and Black drivers. Native Americans have the highest average serious violation score across all years.

Table 36: Statewide Average Seriousness of Violations, 2015 to 2019

	White	Black	Native American	Asian	Pacific Islander	East Indian	Hispanic	Other
2015	.051	.116	.245	.039	.117	.023	.085	.056
2016	.058	.125	.245	.039	.121	.022	.090	.055
2017	.060	.133	.264	.040	.118	.022	.090	.060
2018	.058	.115	.243	.035	.120	.021	.083	.060
2019	.059	.120	.236	.038	.112	.021	.087	.054
All years	.057	.122	.246	.038	.118	.022	.087	.057

The average number of violations for each APA is presented in Table 37 below, and the average seriousness of violation score in Table 38 below. As indicated, the average number of violations and seriousness of violation score varies depending on APA assignment. However, for several APAs, Native Americans drivers have the highest average serious violation score, often followed by Black drivers.

Table 37: APA Average Number of Violations, 2015 to 2019

	White	Black	Native American	Asian	Pacific Islander	East Indian	Hispanic	Other
1	1.31	1.52	1.33	1.28	1.41	1.15	1.50	1.30
2	1.37	1.60	1.82	1.34	1.55	1.28	1.55	1.28
3	1.48	1.60	1.70	1.44	1.64	1.40	1.59	1.53
4	1.39	1.52	1.70	1.35	1.47	1.33	1.51	1.35
5	1.34	1.55	1.63	1.33	1.44	1.29	1.51	1.37
6	1.35	1.55	1.60	1.34	1.59	1.33	1.51	1.35
7	1.26	1.44	1.62	1.26	1.31	1.26	1.38	1.26
8	1.31	1.44	1.74	1.22	1.50	1.24	1.48	1.36
10	1.34	1.35	1.79	1.31	1.39	1.37	1.47	1.15
11	1.21	1.30	1.57	1.17	1.25	1.17	1.37	1.18
12	1.25	1.33	1.55	1.21	1.23	1.13	1.40	1.43
13	1.25	1.37	1.65	1.19	1.31	1.21	1.36	1.24
14	1.32	1.44	1.44	1.23	1.31	1.25	1.46	1.28
15	1.51	1.59	1.73	1.39	1.60	1.36	1.54	1.89
16	1.31	1.42	1.35	1.29	1.32	1.36	1.43	1.31
19	1.44	1.62	1.64	1.41	1.70	1.40	1.52	1.50
20	1.22	1.28	1.28	1.21	0.99	1.22	1.29	1.29
21	1.40	1.57	1.54	1.35	1.66	1.43	1.50	1.37
22	1.38	1.43	1.74	1.23	1.50	1.19	1.47	1.50
23	1.19	1.25	1.28	1.14	1.34	1.14	1.24	1.15
24	1.32	1.46	1.45	1.28	1.52	1.29	1.44	1.36
25	1.37	1.45	1.65	1.32	1.40	1.29	1.48	1.40
26	1.32	1.42	1.52	1.33	1.32	1.43	1.45	1.29
27	1.23	1.29	1.47	1.19	1.18	1.19	1.35	1.34
28	1.28	1.39	1.42	1.25	1.19	1.23	1.49	1.26
30	1.29	1.40	1.69	1.17	1.41	1.18	1.44	1.33
31	1.28	1.35	1.83	1.19	1.39	1.19	1.55	1.34
32	1.28	1.34	1.50	1.22	1.23	1.21	1.38	1.28
33	1.28	1.43	1.65	1.19	1.34	1.20	1.43	1.33
34	1.35	1.44	1.57	1.28	1.34	1.33	1.50	1.26
35	1.42	1.51	1.70	1.33	1.28	1.27	1.56	1.51
36	1.42	1.51	1.57	1.36	1.52	1.39	1.56	1.40
37	1.34	1.46	1.55	1.20	1.43	1.22	1.38	1.38
38	1.34	1.47	1.73	1.27	1.28	1.18	1.60	1.45
39	1.19	1.21	1.54	1.13	1.33	1.20	1.26	1.10
40	1.30	1.41	1.53	1.23	1.25	1.23	1.37	1.28

Table 38: Average Seriousness of Violation Score, 2015 to 2019

	White	Black	Native American	Asian	Pacific Islander	East Indian	Hispanic	Other
1	.081	.201	.222	.044	.105	.110	.098	.056
2	.103	.208	.506	.080	.164	.069	.153	.100
3	.106	.169	.288	.082	.137	.066	.124	.131
4	.087	.154	.334	.050	.115	.044	.102	.086
5	.055	.133	.327	.044	.109	.029	.110	.066
6	.067	.147	.295	.063	.143	.032	.121	.077
7	.066	.122	.290	.046	.165	.033	.103	.058
8	.031	.078	.187	.019	.096	0	.066	.046
10	.025	.037	.104	.004	.033	.018	.028	.001
11	.055	.105	.235	.014	.027	.017	.109	.075
12	.042	.080	.258	.014	.071	.030	.094	.086
13	.050	.117	.211	.039	.139	.036	.083	.061
14	.036	.089	.134	.001	.023	.004	.066	.084
15	.053	.079	.143	.030	.035	.023	.044	.092
16	.033	.111	.090	.017	.021	.031	.055	.047
19	.071	.160	.231	.037	.156	.049	.107	.083
20	.012	.022	.074	.001	0	.001	.015	.036
21	.108	.219	.343	.072	.263	.067	.149	.086
22	.049	.098	.303	.028	.167	.066	.067	.055
23	.050	.088	.135	.018	.194	.019	.068	.031
24	.059	.129	.211	.020	.107	.018	.077	.074
25	.030	.077	.172	.016	.001	.001	.051	.037
26	.035	.095	.179	.017	.064	.023	.065	.034
27	.051	.093	.207	.028	0	.032	.065	.091
28	.045	.093	.136	.031	.001	.017	0.93	.054
30	.069	.125	.352	.024	.053	.032	.127	.073
31	.078	.107	.436	.029	.051	.034	.171	.037
32	.056	.088	.226	.027	.048	.010	.078	.020
33	.074	.114	.279	.034	.107	.034	.118	.065
34	.082	.114	.330	.029	.129	.030	.109	.045
35	.037	.079	.090	.013	.024	.008	.050	.045
36	.078	.124	.270	.040	.143	.050	.104	.062
37	.090	.138	.275	.034	.054	.027	.075	.081
38	.104	.148	.363	.065	.090	.039	.159	.081
39	.034	.067	.066	.006	.086	0	.050	.004
40	.036	.078	.185	.017	.137	.001	.050	.150

Multivariate Arrest Citation Analysis

Multivariate analysis of arrest citations was also conducted to determine whether evidence of bias exists in the issuance of arrest citations. The dependent variable is whether an arrest citation occurred (0 = No and 1 = Yes). Logistic regression was used and includes the following independent variables: number of violations, seriousness of violations, seatbelt violations, equipment violations, license/registration violations, insurance violations, distracted driving violations, whether the stop occurred due to an emphasis patrol, whether the stop occurred at night, driver characteristics including age, gender, and race, and the gender of the officer. This analysis indicates that Asian/Pacific Islander and Hispanic drivers are more likely to receive an arrest citation compared to White drivers, but Native American drivers and Black drivers are statistically less likely to receive an arrest citation than White drivers. Asian/Pacific Islander drivers' odds of receiving an arrest citation are 1.24 times that of White drivers, while the Hispanic drivers' odds of receiving a citation are 1.10 times that of White drivers. Females are less likely to receive an arrest citation than males, younger drivers are more likely to receive an arrest citation than older drivers, and night stops are less likely to result in arrest citations. Number of violations, seriousness of violations, seatbelt violations, insurance violations, distracted driving violations, speeding, and interstate stops all increase the likelihood of arrest citations. Seriousness of violations increase the odds of receiving an arrest citation 64.06 times, seatbelt violations increase the odds of receiving an arrest citation 24.55 times, speeding increases the odds of receiving an arrest citation 6.96 times and stops on the interstate increase the odds of getting an arrest citation 1.68 times (See Table 39 below).

Table 39: Logistic Regression of Arrest Citations

<i>Variable</i>	<i>Coefficient (S.E.)</i>	<i>Odds Ratio</i>	<i>Z Value</i>	<i>Significance</i>
Driver Characteristics:				
Female	-4.730e-02 (2.772e-03)	0.9538	-17.06	.000***
Age	-1.203e-02 (8.642e-05)	0.9880	-139.18	.000***
Black	-5.240e-02 (5.869e-03)	0.9489	-8.93	.000***
Hispanic	9.701e-02 (4.387e-03)	1.1019	22.113	.000***
Native American	-2.172e-01 (1.876e-02)	0.8047	-11.579	.000***
Asian/ Pacific Islander	2.208e-01 (6.054e-03)	1.2470	36.465	.000***
Other Race	2.275e-01 (7.333e-03)	1.3132	37.163	.000***
Nature of Contact:				
Number of Violations	4.121e-01 (3.538e-03)	1.5099	116.474	.000***
Violation Seriousness	4.160 (1.567e-02)	64.062	265.405	.000***
Seatbelt	3.201 (7.486e-03)	24.553	427.575	.000***
Equipment	-9.396e-02 (3.160e-03)	0.3203	-26.030	.000***
License/Registration	-1.652e-01 (4.537e-03)	0.8478	-36.407	.000***
Insurance	-1.652e-01 (6.281e-03)	1.7456	88.698	.000***
Distracted Driving	1.426 (7.683e-02)	4.1615	185.582	.000***
Speed	1.940 (3.541e-03)	6.9616	547.929	.000***
Emphasis	-9.396e-02 (3.610e-02)	0.9103	-190.866	.000***
Interstate	5.225e-01 (2.705e-03)	1.6862	193.137	.000***
Night	-1.205e-01 (2.844e-03)	0.8825	-43.968	.000***
Officer Characteristics:				
Female Officer	-3.444e-01 (5.701e-03)	0.7087	-60.407	.000***
Constant	-1.627 (5.948e-03)	0.1966	-273.458	.000***
X ² =1144855, d.f. = 19, p-value = .000				

Speeding Arrest Citation Analysis

Lastly, we conduct multivariate analysis of drivers who received speeding violations using the same dependent variable (whether an arrest citation occurred) and independent variables. This analysis indicates when examining only drivers who have received speeding violations, Black drivers and Native American drivers are significantly less likely to receive arrest citations compared to White drivers, while differences between Hispanic drivers and White drivers are not significant (indicating there is no difference). Asian/Pacific Islanders are more likely to receive an arrest citation compared to White drivers; Asian/Pacific Islander drivers' odds of receiving an arrest citation are 1.15 times that of White drivers even while controlling for several variables. Seriousness of violations increase the odds of receiving an arrest citation 18.34 times, seatbelt violations increase the odds of receiving an arrest citation 6.07 times, speeding on the interstate increase the odds of getting an arrest citation 1.5 times (See Table 40 below).

Table 40: Logistic Regression of Speeding Violations and Arrest Citations

<i>Variable</i>	<i>Coefficient (S.E.)</i>	<i>Odds Ratio</i>	<i>Z Value</i>	<i>Significance</i>
Driver Characteristics:				
Female	-0.0050996 (.004399)	0.9949	-1.159	.000***
Age	-0.0144203 (.0001371)	0.9867	-105.147	.000***
Black	-0.1867795 (.0092346)	0.8296	-20.226	.000***
Hispanic	-0.0058779 (.0068835)	0.9941	-0.3932	.03932
Native American	-0.2884117 (0.0298059)	0.7495	-9.676	.000***
Asian/ Pacific Islander	0.1448158 (0.0094851)	1.1558	15.268	.000***
Other Race	0.1138965 (0.114628_	1.1206	9.936	.000***
Nature of Contact:				
Number of Violations	1.0493906 (0.0054925)	2.8559	191.059	.000***
Violation Seriousness	2.9092090 (0.0260700)	18.3423	111.592	.000***
Seatbelt	1.8046600 (0.0117582)	6.0779	153.482	.000***
Equipment	-2.3442287 (0.0087773)	0.0959	-267.215	.000***
License/Registration	-1.0899944 (0.0065483)	0.3362	-166.456	.000***
Insurance	-0.1279292 (0.0097464)	0.8799	-13.126	.000***
Distracted Driving	.0244043 (0.0120411)	1.0247	2.027	.0427*
Emphasis	-0.3134918 (0.0056366)	0.7309	-267.215	.000***
Interstate	0.4068536 (0.0042500)	1.5021	95.731	.000***
Night	-0.1464300 (.0044822)	0.8638	-32.669	.000***
Officer Characteristics:				
Female Officer	-0.4273776 (0.0089693)	0.6522	-47.649	0.2463
Constant	-0.5792324 (.0088876)	0.5603	-65.173	.000***

$X^2=278599.4$, d.f. = 18, p-value = .000

CONCLUSIONS

Multiple recent and widely publicized incidents indicating racial disparity in the interactions between law enforcement and persons of color have highlighted the need for continued vigilance when it comes to analyzing, understanding and learning from race related data collected during these interactions. The ability to clearly demonstrate the presence of racially biased policing continues to be a challenge to researchers. The most obvious and cost-effective method has been to compare traffic stop data with the makeup of the population for the geographic area using Census data. Unfortunately, there are many factors that render this method incomplete at best, including the fact that the racial/ethnic composition of the population in a geographic area may not accurately reflect the driving population of that area. Because of this limitation, the study report presented here has, in addition to Census data comparison, included other currently recognized analyses to provide the most complete picture of traffic stop data for the WSP for years 2015 through 2019.

The benchmark comparisons in this report included comparing trooper initiated stops to Census data, analysis of trooper-initiated contact compared to calls for service, trooper-initiated contacts compared to collision data and the “veil of darkness analysis” at the county and state level. A disparity index analysis was also conducted at the state level. For determining whether bias is evident in enforcement decisions, multivariate ordinal regression analysis was also conducted as well as an analysis of searches and a hit rate analysis. Although no single comparison is sufficient to determine the existence of racially biased policing, repeated indications of disproportionality are an indicator that additional examination and analysis of the data is warranted. It is important to note that disproportionality based on race/ethnicity does not on its own indicate racially biased policing, it does however, provide indicators for further investigation into the possible causes for the disproportionality.

The enforcement analysis presents mixed results for searches and arrest citations. Despite similar search rates, the searches of Black and Hispanic motorists are less productive. For Native American drivers, the search rates are slightly higher than for White motorists, but also less productive. Additionally, the multi-variate analysis of high discretion searches finds that Native American and Hispanic drivers are searched more than White motorists even while controlling for numerous variables. The findings that race and ethnicity impacted searches was found by the DGSS research team in 2007, suggesting that this disparity warrants further examination by the WSP.

In contrast, the arrest citation analysis indicates that Asian/Pacific Islander motorists and Hispanic motorists are significantly more likely to receive an arrest citation. These differences persist even when including several control variables. Black motorists and Native American motorists were less likely than White drivers to receive an arrest citation than White drivers. When examining arrest citations for drivers who received a speeding violation, Black motorists and Native American motorists are again statistically less likely to receive an arrest citation than White motorists, while there is no difference between Hispanic motorists and White motorists. However, Asian American motorists are statistically more likely to receive an arrest citation than are White motorists. We recommend examining what may be contributing to inconsistent odds of arrest citations across demographic groups.

RECOMMENDATIONS

- While we do not find evidence of discrimination in the decision to stop, we encourage the WSP to examine what appears to be overrepresentation of Black motorists compared to their proportion of the population in stops at the state-level, and in Pierce and King County. We also suggest the WSP examine potential overrepresentation of Hispanic motorists in stops in Benton County.
- Preliminary enforcement analysis suggests that Black and Hispanic motorists experience high discretion searches more often (according to multivariate analysis), but have lower rates where contraband is found (hit rate analysis). This disproportionality was also found in previous reports. We suggest the WSP further examine the data to better understand disproportionalities.

DATA RECOMMENDATIONS

- The Washington State Patrol has a data collection and management strategy that seems to serve agency needs well but causes challenges for independent, multivariate analysis. Two issues dominate this concern: (1) the format in which data is stored (a series of tables) and (2) storage of data two different sources/databases. With regard to the first issue, the current format of the data makes combining data accurately difficult which can impact analysis accuracy and validity. With large, multiyear datasets, this also requires big data processing capabilities which can add to time and costs for independent analyses. For the second issue, some variables useful for multi-variate analysis are not necessarily stored in the same database and linking data between the two storage systems is difficult or impossible, in some cases. To ease analysis in the future, WSP could benefit from funding for a centralized data management system, especially a system that automates some of the data collection processes which would reduce the resources required for independent analysis.
- In the course of this research, DGSS researchers were made aware that linking stop location data to specific geographic regions is difficult as APA region is a geographic area to which a trooper is assigned rather than the specific location of the stop. Additionally, determining the county in which the contact occurred was difficult as it necessitated linking manually entered mile-post data with GIS mapping of Washington State. Because troopers manually enter their location data for each contact, data entry issues (human error) led to inability to establish an accurate stop location. To ease independent analysis, adding county and/or APA region of stop to data collection processes would be beneficial. As mile-post data can be difficult to map accurately and leaves room for data entry errors, adopting automated systems that allow for precise location data to be incorporated with contact information, such as latitude and longitude, could be beneficial. The ability to automatically link latitude and longitude, or at least more easily link county-level information where the stop occurred would enable increased accuracy in future WSP traffic stop data analysis.
- DGSS also recommends that enforcement actions record formats be revised to separate citations and arrests. Currently, there is no reliable method for separating arrests and citations in the data. As arrests and citations have different implications for enforcement, tracking these activities separately will aid in future analysis and is important for examining for potential bias in enforcement activities.
- It is also recommended that WSP track all stops that occur due to district emphasis. As indicated in the report, WSP encourages APA regions to determine violation emphasis based on various data. These emphases are not necessarily recorded as an emphasis stops and therefore are difficult to identify and separate. As these emphases reduce trooper discretion in terms of stops and enforcement actions, assigning a special code for these stops would aid future analysis.

BIBLIOGRAPHY

- Anwar, S., & Fang, H. (2006). An alternative test of racial prejudice in motor vehicle searches: Theory and evidence. *American Economic Review*, 96(1), 127-151.
- Bonner, H. S., & Stacey, M. (2018). Measuring Disproportionate Treatment in Policing: One Department's Experience. *Journal of Criminal Justice and Law*, 84.
- Cordner, G., Williams, B., & Velasco, A. (2002). Vehicle stops in San Diego: 2001. *San Diego, CA: San Diego Police Department*.
- Fridell, L. A. (2004). By the numbers: A guide for analyzing race data from vehicle stops. Washington, DC: Police Executive Research Forum.
- Gaines, L. K. (2006). An analysis of traffic stop data in Riverside, California. *Police Quarterly*, 9(2), 210-233.
- Goel, S., & Phillips, C. (2017). *Police Data Suggests Black and Hispanic Drivers Are Searched More Often Than Whites*. SLATE.
- Grogger, J., & Ridgeway, G. (2006). Testing for racial profiling in traffic stops from behind a veil of darkness. *Journal of the American Statistical Association*, 878-887.
- Gross, S. R. (2002). Road Work: Racial Profiling and Drug Interdiction on the Highway. *Michigan Law Review*, 651-754.
- Hernández-Murillo, R., & Knowles, J. (2004). Racial Profiling or Racist Policing? Bounds Tests in Aggregate Data. *Federal Reserve Bank of St. Louis Working Papers*, 1-36.
- Higgins, G. E., Vito, G. F., & Grossi, E. L. (2012). The impact of race on the police decision to search during a traffic stop: A focal concerns theory perspective. *Journal of Contemporary Criminal Justice*, 28(2), 166-183.
- Horrace, W. C., & Rohlin, S. M. (2016). How dark is dark? Bright lights, big city, racial profiling. *The Review of Economics and Statistics*, 226-232.
- Ingram, J. R. (2007). The Effect of Neighborhood Characteristics on Traffic Citation Practices of the Police. *Police Quarterly*, 371-393.
- Klinger, D. A. (1997). Negotiating order in patrol work: An ecological theory of police response to deviance. *Criminology*, 35(2), 277-306.
- Knowles, J., Persico, N., & Todd, P. (1999). Racial Bias in Motor Vehicle Searches: Theory and Evidence. *Journal of Political Economy*, 203-229.
- Lamberth, J. C. (2006). *Data Collection and Benchmarking of the Bias Policing Project: Final Report for the Metropolitan Police Department in the District of Columbia*. Lamberth Consulting.
- Lange, J. E., Blackman, K. O., & Johnson, M. B. (2001). Speed violation survey of the New Jersey Turnpike: Final report. *Public Services Research Institute*.
- Lange, J. E., Johnson, M. B., & Voas, R. B. (2005). Testing the racial profiling hypothesis for seemingly disparate traffic stops on the New Jersey Turnpike. *Justice Quarterly*, 22(2), 193-223.
- Lundman, R. J., & Kaufman, R. L. (2003). Driving while Black: effects of race, ethnicity, and gender on citizen self-reports of traffic stops and police actions. *Criminology*, 195-220.
- Novak, K. J. (2004). Disparity and racial profiling in traffic enforcement. *Police Quarterly*, 65-96.
- Oakland Police Department. (2004). Promoting cooperative strategies to reduce racial profiling: A technical guide. Oakland, CA: Author.
- Persico, N., & Todd, P. (2006). Generalizing the hit rates test for racial bias in law enforcement, with an application to vehicle searches in Wichita. *The Economic Journal*, 116(515), F351-F367.
- Persico, N., & Todd, P. E. (2008). The hit rates test for racial bias in motor-vehicle searches. *Justice Quarterly*, 25(1), 37-53.
- Pickerill, J. M., Mosher, C., & Pratt, T. (2009). Search and seizure, racial profiling, and traffic stops: A disparate impact framework. *Law & Policy*, 31(1), 1-30.
- Pierson, E., Corbett-Davies, S., & Goel, S. (2018). Fast Threshold Tests for Detecting Discrimination. *Stanford University*.

- Pierson, E., Simoiu, C., Overgoor, J., Corbett-Davies, S., Jenson, D., Shoemaker, A., Goel, S. (2020). A large-scale analysis of racial disparities in police stops across the United States. *Nature Human Behavior*.
- Ridgeway, G. (2009). Cincinnati Police Department traffic stops: Applying RAND's framework to analyze racial disparities. Santa Monica, CA: RAND.
- Ritter, J. A. (2013). Racial Bias in Traffic Stops: Tests of a Unified Model of Stops and Searches. *Working Paper No. 2013-05. Department of Applied Economics, University of Minnesota*, 1-39.
- Sanga, S. (2009). Reconsidering Racial Bias in Motor Vehicle Searches: Theory and Evidence. *Journal of Political Economy*, 1155-1159.
- Schafer, J. A., Carter, D. L., & Katz-Bannister, A. (2004). Studying traffic stop encounters. *Journal of Criminal Justice*, 159-170.
- Schafer, J. A., Carter, D. L., Katz-Bannister, A. J., & Wells, W. M. (2006). Decision Making in Traffic Stop Encounters: A Multivariate Analysis of Police Behavior. *Police Quarterly*, 184-209.
- Simoiu, C., Corbett-Davies, S., & Goel, S. (2017). The problem of infra-marginality in outcome tests for discrimination. *The Annals of Applied Statistics*, 1193-1216.
- Smith, M. R., & Alpert, G. P. (2002). Searching for direction: Courts, social science, and the adjudication of racial profiling claims. *Justice Quarterly*, 19(4), 673-703.
- Smith, M. R., & Petrocelli, M. (2001). Racial profiling? A multivariate analysis of police traffic stop data. *Police Quarterly*, 4-27.
- Taylor, J., & Whitney, G. (1999). Crime and racial profiling by US police: Is there an empirical basis? *The Journal of Social, Political, and Economic Studies*, 24(4), 485.
- Tillyer, R., & Engel, R. S. (2013). The impact of drivers' race, gender, and age during traffic stops: Assessing interaction terms and the social conditioning model. *Crime & Delinquency*, 59(3), 369-395
- Tillyer, R., Engel, R. S., & Cherkaskas, J. C. (2010). Best practices in vehicle stop data collection and analysis. *Policing: An International Journal of Police Strategies & Management*.
- Tillyer, R., Engel, R. S., & Wooldredge, J. (2008). The intersection of racial profiling research and the law. *Journal of Criminal Justice*, 36(2), 138-153.
- Taniguchi, T., Hendrix, J., Aagaard, B., Strom, K., Levin-Rector, A., & Zimmer, S. (2016). *Test of Racial Disproportionality in Traffic Stops Conducted by the Fayetteville Police Department*. Research Triangle Park, NC: RTI International.
- Vito, G. F., & Walsh, W. F. (2008). Suspicion and traffic stops: Crime control or racial profiling. *International Journal of Police Science & Management*, 10(1), 89-100.
- Walker, S. (2001). Searching for the denominator: Problems with police traffic stop data and an early warning system solution. *Justice Research and Policy*, 3(1), 63-95.
- Warren, P., Tomaskovic-Devey, D., Smith, W., Zingraff, M., & Mason, M. (2006). Driving While Black: Bias Processes and Racial Disparity in Police Stops. *Criminology*, 709-738.
- Withrow, B. L. (2004). Driving While Different: A Potential Theoretical Explanation for Race-Based Policing. *Criminal Justice Policy Review*, 344-364.
- Withrow, B. L. (2004). Race-Based Policing: A Descriptive Analysis of the Wichita Stop Study. *Police Practice and Research*, 223-240.
- Worden, R. E., McLean, S. J., & Wheeler, A. P. (2012). Testing for racial profiling with the veil-of-darkness method. *Police Quarterly*, 15(1), 92-111.
- Zingraff, M. T., Mason, H. M., Smith, W. R., Tomaskovic-Devey, D., Warren, P., McMurray, H. L., & Fenlon, C. R. (2000). Evaluating North Carolina state highway patrol data: Citations, warnings, and searches in 1998. *report submitted to North Carolina Department of Crime Control and Public Safety and North Carolina State Highway Patrol*.
- Zingraff, M. T., Smith, W. R., & Tomaskovic-Devey, D. (2003). Studying Racial Disparity in Traffic Stops and Outcomes: Lessons Learned in North Carolina. *NIJ Journal*, 48-50.