

Examining Traffic Stop Disparities by the Highland Park Borough
Police Department

REPORT

Prepared for

Highland Park Borough
Public Safety Committee
Highland Park, New Jersey 08904

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Executive Summary

Some residents of Highland Park Borough have suggested that race has been used by the Highland Park Police Department (HPPD) as a pretext for stopping, questioning or engaging some segments of the population. For example, according to the Highland Park Planet Newspaper, in March 2018, an African-American teen male resident was observed taking pictures of homes on his street. Police officers in the area investigating a rash of burglaries, observed the young man. Several officers responded to the area and attempted to question the resident, but the juvenile entered his home before police officers could question him. Some residents point to this incident as an example of disparity of treatment of the African-American community by a police department that is predominantly Caucasian.

In an effort to examine the relationship between the HPPD and the Highland Park Borough community relative to traffic stops, the Highland Park Borough provided De Lacy Davis Consultants (DDC) with 5 years of traffic stop data. In consultation with the Highland Park Mayor and the Public Safety Committee, DDC made several data collection recommendations so that traffic stops could be examined. The investigation was funded solely by DDC as a public service initiative with intentions of contributing to the body of work in this area. The Highland Park Borough provided no financial support for this study.

Data

The researchers analyzed 14,203 HPPD traffic stops. HPPD provided three traffic stop datasets for the period 2014-2018. The first two datasets were merged to create one data list for 2014-2018. A total of 39 rows were removed for duplicate incident number information. The data fields included officer, incident number, date/time, disposition, location, driver race, driver ethnicity, driver gender, vehicle make, vehicle model, and party age. Once all of the available data were collected, it was determined that the datasets needed to be reconfigured to maximize the dataset from the available sample.

Cleaning Process

All rows with blank driver race and blank driver ethnicity were removed. All rows of data with unknown driver race remained if an ethnicity was included. All rows of data with blank driver race remained if an ethnicity was included. Rows with missing officer name remain in the data set, since the study did not control for officer information.

We analyzed data from 14,203 of HPPD traffic stops, ranging from January 1, 2014 to December 31, 2018. The traffic stop data were collected directly from the HPPD's Enforcsys system and InfoCop system on two different dates. After reviewing the datasets, it was determined that the ability to merge the Enforcsys data set with InfoCop was not currently available. It was requested to have the software developer Enforcsys create the ability to extract reports from both datasets. The new dataset included all variables required to analyze the traffic stops from January 2014 – December 2018.

An inter-rater reliability scale was used. Several different researchers reviewed these data and provided insight. The independent results received from each researcher were similar. Inter-

rater reliability is the extent to which different observers are consistent in their observations or judgments.

Analytic Approach

This study utilized a quantitative methodology with a causal comparative, quasi-experimental research design because data from a pre-existing group were used. A pre-existing group means this group has not been randomly assigned; rather, it has been naturally formed. The research team used a variation of the *veil of darkness* (VOD) approach, which hypothesizes that the chances of a police officer identifying the race of a motorist before the stop is greater in the daylight than in the dark (Grogger & Ridgeway, 2006; Taniguchi et al., 2016). The approach uses daylight saving time variations to analyze evening stops and daytime stops. Taniguchi (2016) used traffic stops during inter-twilight hours of 5:30 p.m. – 9:30 p.m. to compare to traffic stops during the day and night.

Similar to the traditional VOD approach, researchers in this study used a VOD hypothesis (daytime vs. nighttime) to analyze racial disproportionality by comparing drivers stopped during daytime with drivers stopped after dark (Taniguchi et al., 2016). The implication of the VOD hypothesis is that the race distribution of drivers stopped during the day should differ from the race distribution of drivers stopped at night if officers engage in racial profiling. Variations of daylight savings time across the time range were used to account for times when it is assumed that a police officer can see the occupant of a vehicle (daytime) versus the time when it is dark, and a police officer may not be able to identify the race of the driver (nighttime). The researchers determined daytime versus nighttime by identifying sunrise and sunset times of each day relative to the time of year for a more accurate indication of when drivers were stopped. These benchmarks helped the researchers differentiate the relationship between daytime and nighttime for the purposes of this study. Hence, stops after sunrise and before sunset were identified as daytime stops and stops after sunset and before sunrise were identified as nighttime stops. The study was designed to determine if there is a difference in the frequency of traffic stops when the driver is Black (non-Hispanic) or Hispanic versus White (non-Hispanic) relative to time of day.

To further analyze this data a frequency analysis was used to determine if disproportionality was present in the frequency of traffic stops in Highland Park, NJ during the years 2014 to 2018. The frequency of traffic stops is compared to the Borough's population as indicated by the 2010 Census population data for Highland Park, NJ. The 2010 Census data were applied to the study because it represents the most accurate population estimates of Highland Park, NJ before the study was conducted at the start of 2014. Further, comparisons were made between groups to understand whether there was a significant difference in stops between racial/ethnic groups.

- The researchers compared the percentage of stops by Black drivers during the daytime to the percentage of the Black population in Highland Park, NJ from 2014 to 2018.
- The researchers compared the percentage of stops by Hispanic/Latinx drivers during the daytime to the percentage of the Hispanic/Latinx population in Highland Park, NJ from 2014 to 2018.

- The researchers compared the percentage of stops by White drivers during the daytime to the percentage of the White population in Highland Park, NJ from 2014 to 2018.

Findings

Upon analysis of the data, it was found that there was racial disproportionality for Black and Asian drivers relative to traffic stop data from 2014-2018. The following was found:

- Black drivers were approximately two and a half times or (250%) more likely to be stopped during the daytime for a traffic violation relative to the population of Black people that resided in Highland Park, NJ.
- Hispanic drivers are approximately one and three-fourth times or (175%) more likely to be stopped during the daytime for a traffic violation relative to the population of Hispanic people that resided in Highland Park, NJ.
- White drivers were approximately three-tenth times, or (30%) less likely to be stopped during the daytime for a traffic violation relative to the population of White citizens that resided in Highland Park, NJ.
- Black drivers were 1.3 times more likely to be stopped at night versus White and Hispanic/Latinx drivers.
- Asian drivers were 1.5 times more likely to be stopped at night versus White and Hispanic/Latinx drivers.
- Black male drivers were 1.4 times more likely to be stopped at night versus White and Hispanic/Latinx drivers.
- Asian male drivers were 1.63 times more likely to be stopped at night versus White and Hispanic/Latinx drivers.
- Black female drivers were 1.22 times more likely to be stopped at night versus White and Hispanic/Latinx drivers.
- Asian female drivers were 1.21 times more likely to be stopped at night versus White and Hispanic/Latinx drivers.
- Approximately 60% of females for all races were stopped during the daytime versus 35%-39% during nighttime traffic stops.
- There were only 53 arrests of 14,127 traffic stops (Asian/PI, 8, Black 21, White/Hispanic, 24).

Discussion

The data suggest that the HPPD disproportionately stopped Black, Hispanic, and Asian drivers in traffic stops during the daytime from 2014 to 2018. In addition, the data suggest that White drivers were less likely to be stopped for traffic violations in comparison to the population and the frequency of traffic stops. White citizens were 63.6% of the Highland Park Borough population, but represented only 54.1% of the traffic stop summons. We found statistical significance between race and sex.

Introduction

This study was approached with the understanding that there may be data collection issues. It was important that the researchers not suffer from confirmation bias. That is, the researchers reviewed data frequently to reduce the chances of giving more weight to data that may support a predetermined outcome, rather than the overall evidence. As discussed on several occasions, the data are historical, which cannot change. One weakness of this study is that some data were unusable; a total of 4,820 traffic stops were not usable. These data were missing information like race and or gender which were important to the study.

Ethnicity was another complication of the study. Hispanics/Latinx had to be disaggregated from the demographic data point of White/Caucasian drivers. While there were 8,306 traffic stops documented as White drivers within that group, 2,162 were Hispanic/Latinx, which reduced the White motorist group to 6,144 traffic stops. The researchers wanted to understand whether or not implicit bias was the driving factor for the inclusion of Hispanic/Latinx motorist in the White motorist group. Like the New Jersey State Trooper traffic stop lawsuit in *State vs. Soto* (*State v. Soto*, 324 N.J. Super. 66, N.J. Super. App. Div. 1996), the researchers wanted to use “evidence showing that either there actually are defects which bias the results or the missing factors, when properly organized and accounted for, eliminate or explain the disparity” (*State v. Soto*, 324 N.J. Super. 66, 84, N.J. Super. App. Div. 1996). There was no evidence that HPPD intentionally conflated Hispanic/Latinx with White motorists. After the datasets (Enforcsys and InfoCop) were properly organized, the researchers were able to identify the traffic stops where the motorist was identified as White for race and Hispanic/Latinx as the ethnicity.

The researchers understood that Census data may not sufficiently capture the driving population in Highland Park Borough during all hours of the day. Notably, Census data are a reflection of where people reside during a particular period of time. However, this limitation still reflected disproportionality in traffic stops by race.

Highland Park Borough’s police department demonstrated transparency, professionalism and cooperation throughout the data collection process. The organization’s commitment to this process allowed DDC to independently and objectively analyze these data without external influence. When challenges were identified by the researchers regarding this study, the Highland Park Borough’s public safety committee, and police department leadership responded positively with a collective goal of finding the answers to the questions.

Overall, the results of this study should not be used to improve arguments for one side or there other. The results reflect police practices during a specific period of time that may or may not still exist. One of the goals of this study was to answer the research questions while adding to the body of work in this area. This study should be used to explore trends, examine the impact of police policy and decision making, and to provide a foundation for traffic stop discussions between Highland Park Borough and its community.

Data Analysis and Results

In total, 49% of all traffic stops resulted in the issue of a summons. There was a total of 6,981 summons issued. Conversely, 47% of the traffic stops, or 6,723 stops, resulted in warnings or no action taken. It is important to note that there were only 53 arrests out of 14,203 traffic stops.

Data

The HPPD provided DDC with two datasets to conduct the study. Further examination of the data revealed that individually, neither the EnforcSys, nor the InfoCop data provided all of the data points required to analyze traffic stops for 2014-2018. DDC met with Borough officials and recommended that one of the data collection vendors develop an algorithm to create a third dataset. The third dataset was created by EnforcSys, the developer of the software that the police department uses to capture traffic stop information. DDC requested to have the data correlated between the first two datasets (EnforcSys and InfoCop) to create a single, more complete traffic stop dataset for the time range.

From the dataset, 4,820 stops did not record race or ethnicity data. These stops represented 25% of the total data set. All recorded stops have a summons, arrest, or warning as a disposition. There were 14,203 acceptable lines of data.

There was no delineation between Asian or Pacific Islander (PI) so these categories were merged as Asian/PI-Hispanic or Asian/PI-Non-Hispanic. There were 3,323 traffic stops of Asian/PI Non-Hispanic and 9 Asian/PI Hispanic. There were 2,594 incidents with Black drivers. Some of the dataset listed Hispanic/Latinx as White. For the purpose of this study, there were statistical analyses with Hispanic/Latinx and White as originally identified. Other analyses were run disaggregating Hispanic/Latinx from White. This distinction is explained further in the study.

Analytical Method

We examined the HPPD data for traffic stops for 2014-2018 and included times for sunrise to sunset as (daytime), and sunset to sunrise as (nighttime). This approach is a variation of the VOD approach, which was popularized in use in traffic stop analyses in Oakland, California in 2006 by researchers Grogger and Ridgeway (2006). The researchers made the decision to use a variant of VOD because there were 4,880 traffic stops that could not be included in the analysis. The usable sample size was 14,203. The data that were unusable did not identify race or ethnicity in the stops. It was determined that using a strict VOD methodology would not provide a significant sample size to effectively analyze the datasets.

Several tables reflect analyses that do not total 14,203. In some of the analyses, if certain data points were missing, the item was not counted in the analysis. The impact of the missing data points was minimal.

The analytical approach used for the study provides for clear and straightforward interpretation of the results. Similar to Taniguchi et al. (2016), a statistically insignificant result for a daytime indicator suggests that there was no association between daytime and the race of the driver stopped. Conversely, a statistically significant result for daytime and a particular racial group would indicate that a specific racial group is more likely to be stopped during the daytime. Overrepresentation of Black motor vehicle operators in daytime stops in comparison to nighttime stops would suggest evidence of racial bias.

The data were analyzed using the following guiding questions:

1. Is there a difference in stops between races in Highland Park Borough by police officers?
2. Is there a difference in stops between races in Highland Park Borough by police officers as a function of time of day?
3. Is there is a difference in outcomes of police stops in Highland Park Borough for different races for years 1/01/2014 through 12/31/2018?
4. Are African-Americans (male or female) disproportionately stopped, summoned, or warned in relationship to other racial groups?

Descriptive Statistics for Traffic Stops

The researchers used descriptive statistics to explain the traffic stop dataset used in the analysis. The data, which range from January 1, 2014 to December 31, 2018, are described (gender/day, gender/night, time of day, year of stop, U.S. Census data for race 2010, total driver race, driver race/day, and driver race/night) in Table 1, which reflects the distribution of frequency and percentages of the data. The first column reflects all 14,203 traffic stops that occurred during the date range for the study. The columns on the right reflect U.S. Census data for 2010 with frequency distributions and percentages for all traffic stops, race of driver and percentage of 8,169 daytime stops, and frequency distribution and percentages for race of driver for 6,034 nighttime stops. It is noteworthy that Whites comprise 63.6% of the Highland Park Borough population, but only 39.69% of the traffic stops during 2014 to 2018. In addition, Figure 1 shows the descriptive statistics for the gender of all drivers in the traffic stop sample, and Figure 2 shows the gender of all drivers in the traffic stops by percentage (62% male, 37% female).

Table 1

Descriptive Analysis – 2014-2018

All Data	Number	Percent	Census Data for Race 2010 (13,982)	Number	Percent
	14203	100	American Indian or Alaskan Native (Alone)	11	0.1
			Asian or Pacific Islander (Alone)	2497	17.8
Gender	Number	Percent	Black (Alone)	1018	7.3
Male	8886	62.56	White (Alone)	8886	63.6
Female	5236	36.87	Hispanic	1252	9
Blank	81	0.57	Other	318	2.2
Total	14203	100	Total	13982	100
Gender (Day)	Number	Percent	Race of All HPB Drivers	Number	Percent
Male	4815	58.94	American Indian or Alaskan Native (Alone)	15	0.11
Female	3302	40.42	Asian or Pacific Islander (Alone)	3323	23.4
Blank	52	0.64	Black (Alone)	2523	17.76
Total	8169	100	White (Alone)	6144	43.26
Gender (Night)	Number	Percent	Hispanic	2162	15.22
Male	4071	67.47	Unknown	31	0.22
Female	1934	32.05	Blank	5	0.03
Blank	29	0.48	Total	14203	100
Total	6034	100	Race of Driver (Day)	Number	Percent
Time of Day	Number	Percent	American Indian or Alaskan Native (Alone)	8	0.1
Day	8169	57.52	Asian or Pacific Islander (Alone)	1696	20.76
Night	6034	42.48	Black (Alone)	1377	16.86
Total	14203	100	White (Alone)	3749	45.89
Year Stops Occurred	Number	Percent	Hispanic	1316	16.11
2014	608	4.28	Unknown	20	0.24
2015	4292	30.22	Blank	3	0.04
2016	3038	21.39	Total	8169	100
2017	3763	26.49	Race of Driver (Night)	Number	Percent
2018	2502	17.62	American Indian or Alaskan Native (Alone)	7	0.12
Total	14203	100	Asian or Pacific Islander (Alone)	1627	26.96
			Black (Alone)	1146	18.99
			White (Alone)	2395	39.69
			Hispanic	846	14.02
			Unknown	11	0.18
			Blank	2	0.04
			Total	6034	100

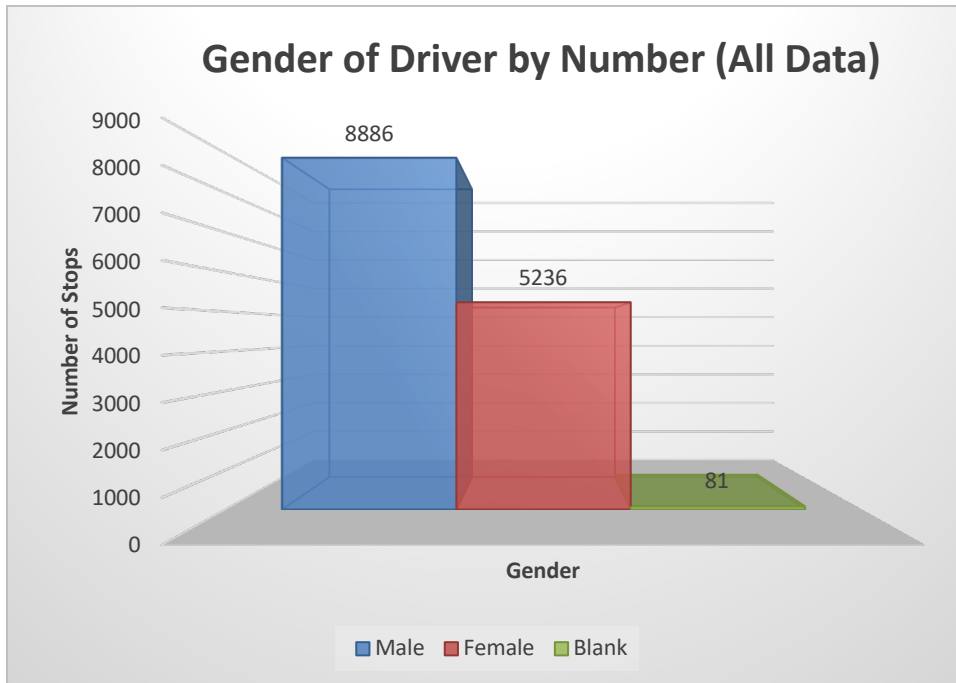


Figure 1. Gender of drivers by number. For all data collected for 2014 through 2018: 8,886 males were stopped, and 5,236 females were stopped.

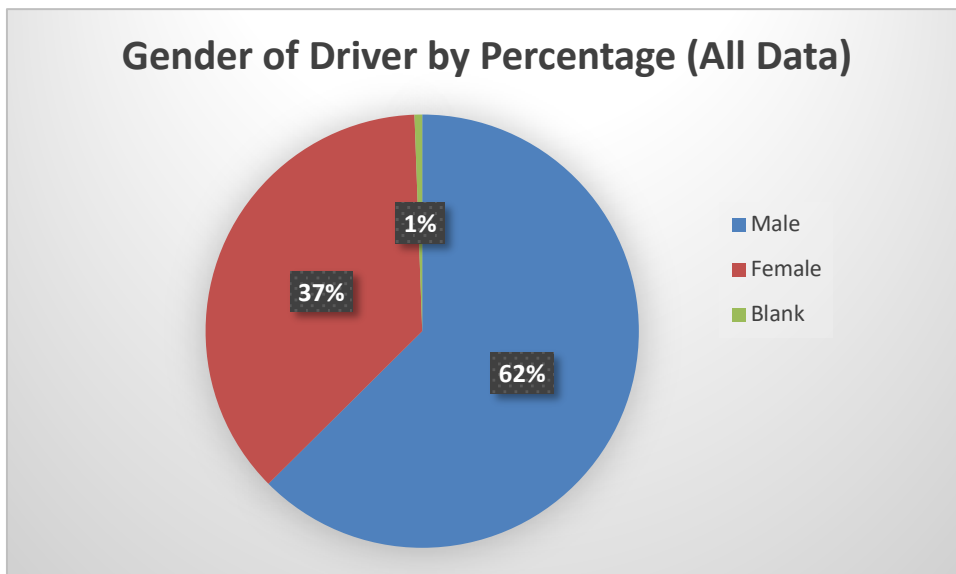


Figure 2. Gender of drivers by percentage. In total, 62% of the drivers were male, and 37% of the drivers were female. Gender data were blank for 1% of the drivers in this dataset.

Variation of Veil of Darkness (Daytime/Nighttime)

Using the variation of the VOD approach, the following figures illustrate the data by gender of the driver and race of the driver, according to daytime and nighttime stops.

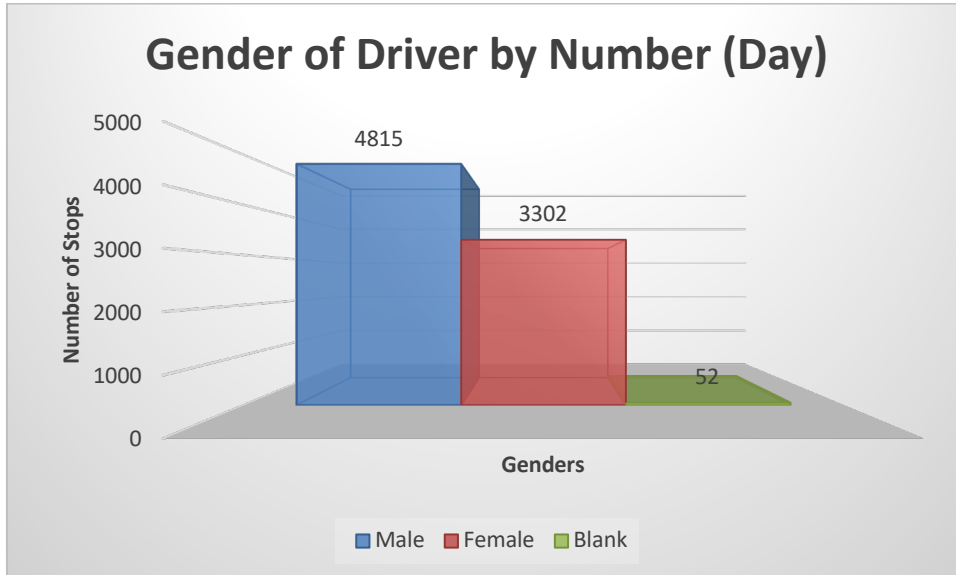


Figure 3. Daytime data: gender of driver by number. Daytime stops by gender reflects 4,815 males and 3,302 females.

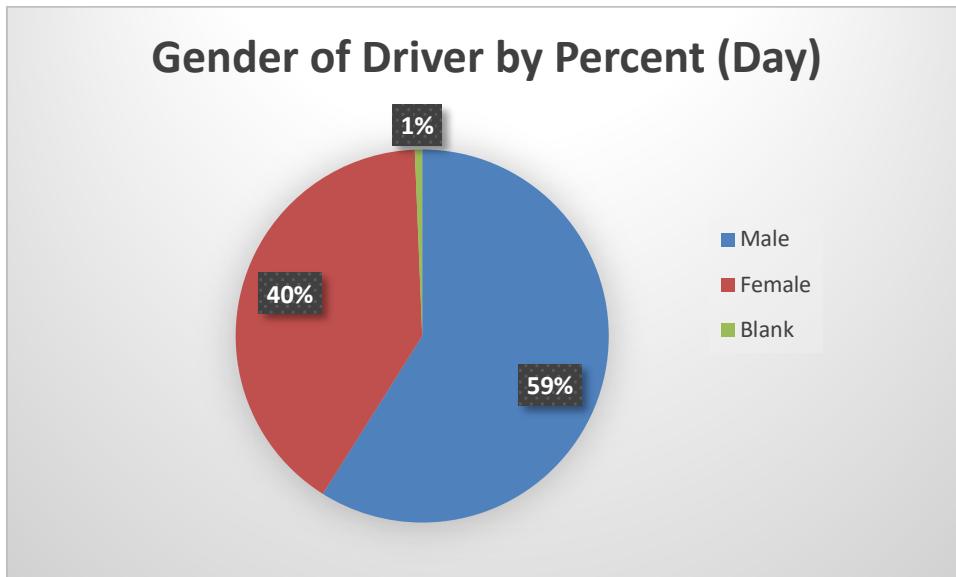


Figure 4. Daytime data: Gender of driver by percent. In all, 59% of daytime stops were male motorists. 40% of daytime stops were female motorists.

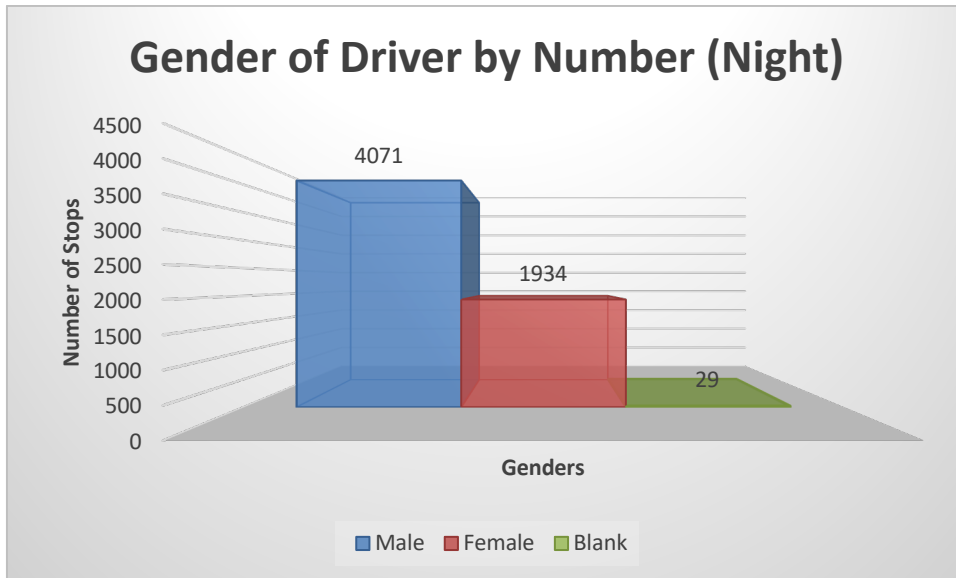


Figure 5. Nighttime data: Gender of driver by number. During nighttime hours, 4,071 males were stopped. 1,934 females were stopped during nighttime.

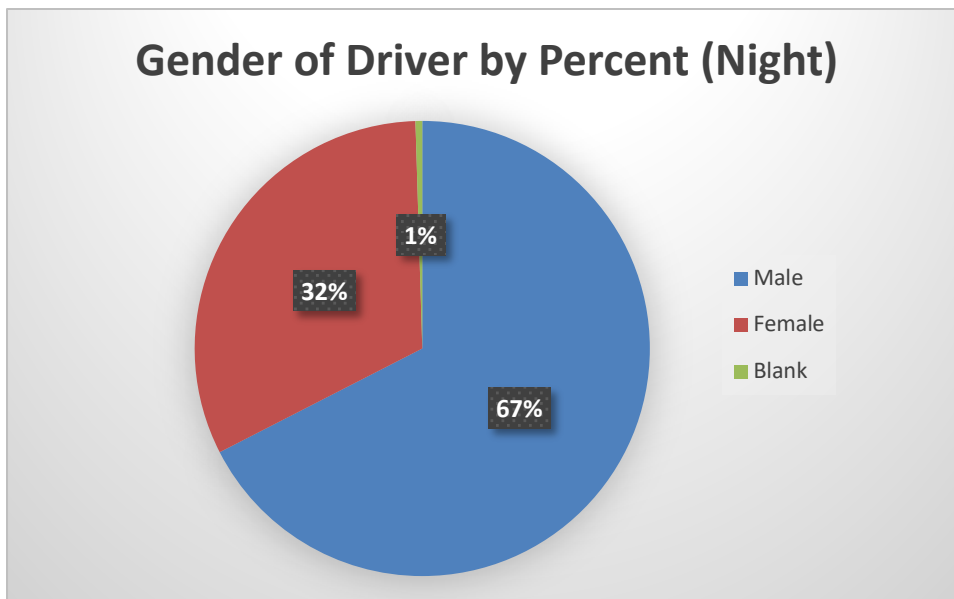


Figure 6. Nighttime data: Gender of driver by percent. The majority of the nighttime stops were male, 67%. Females represented 32% of the nighttime stops.

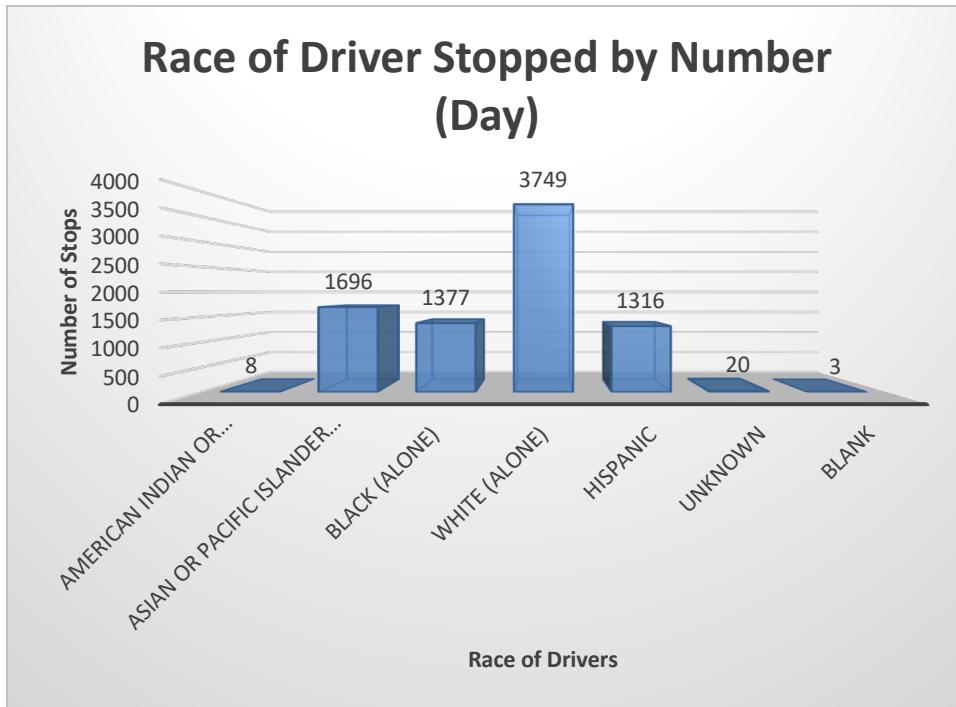


Figure 7. Daytime data: Race of drivers stopped by number.

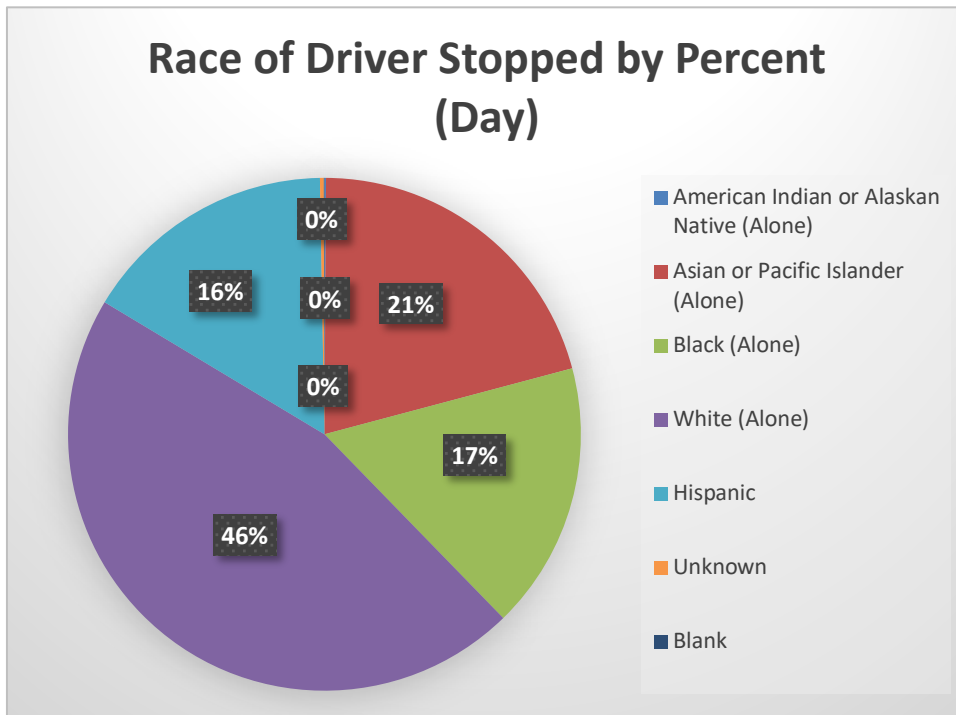


Figure 8. Daytime data: Race of drivers stopped by percentage.

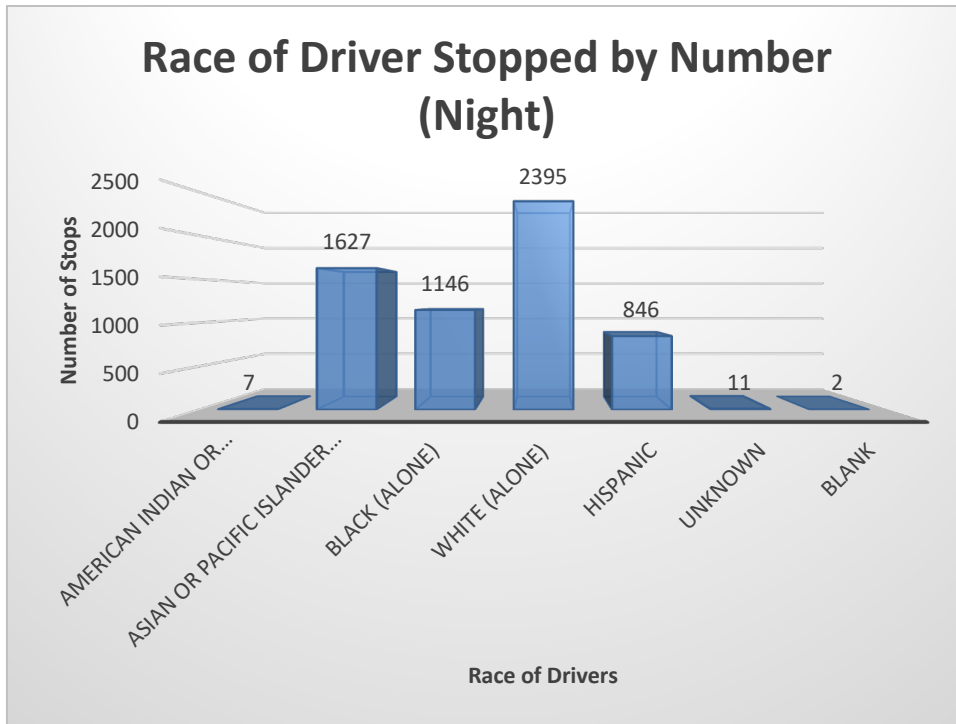


Figure 9. Race of driver stopped by number at nighttime.

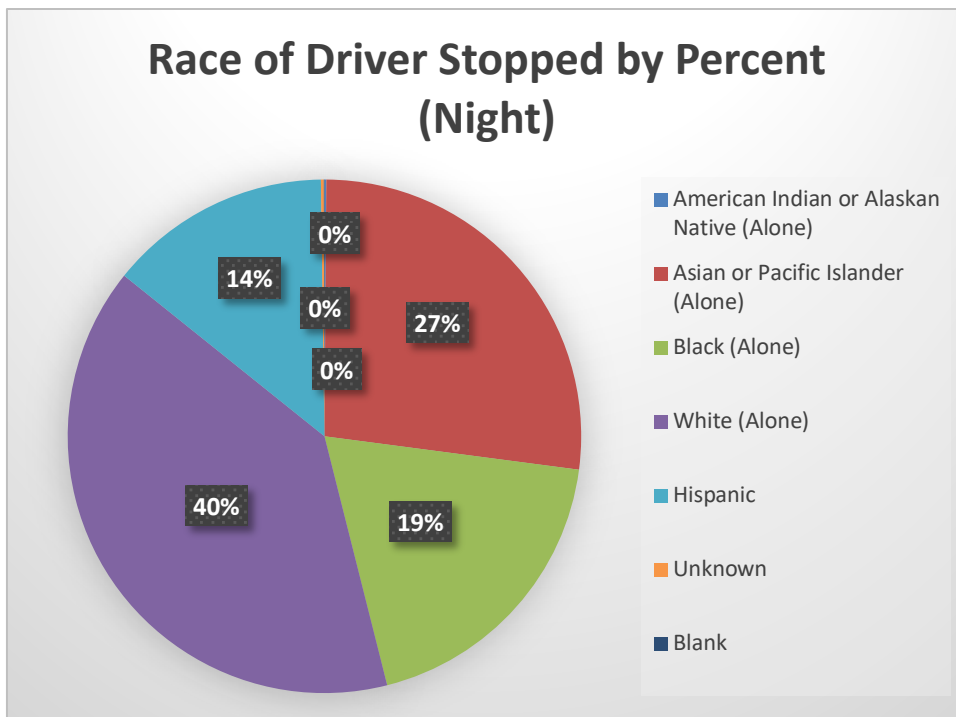


Figure 10. Race of driver stopped at nighttime by percentage.

Race-Sex Interaction

The data suggest that there was an interaction between race and sex in both night and day hours. The data also supported a significant relationship between race and sex (gender) when examining those who were summoned and those who were only warned ($p < .001$). Table 2 and Table 3 illustrate the outcome statistics related to gender and race by whether the driver was summoned or warned.

Table 2

Race of Driver by Gender of Driver Crosstabulation – Summoned

Race of Driver	Gender of Driver		
	Male	Female	Total
American Indian or Alaskan Native	9 (99.9%)	1 (0.1%)	10 (100.0%)
Asian or Pacific Islander	1408 (68.7%)	641 (31.3%)	2049 (100.0%)
Black	666 (59.7%)	449 (40.3%)	1115 (100.0%)
White	1702 (62.2%)	1033 (37.8%)	2735 (100.0%)
Unknown	17 (68.0%)	8 (32.0%)	25 (100.0%)
Hispanic	686 (61.9%)	361 (38.1%)	1047 (100.0%)
Total	4488 (61.6%)	2493 (38.4%)	6981 (100.0%)

Note. Pearson's Chi Square $X^2 = 36.355$, $df = 5$, $p < .001$

Table 3

Race of Driver by Gender of Driver Crosstabulation – Warned

Race of Driver	Gender of Driver		
	Male	Female	Total
American Indian or Alaskan Native	5 (100.0%)	0 (0.0%)	5 (100.0%)
Asian or Pacific Islander	799 (65.7%)	418 (34.3%)	1217 (100.0%)
Black	774 (57.9%)	562 (42.1%)	1336 (100.0%)
White	1989 (61.5%)	1246 (38.5%)	3235 (100.0%)
Unknown	12 (52.2%)	11 (47.8%)	23 (100.0%)
Hispanic	561 (61.9%)	346 (38.1%)	907 (100.0%)
Total	4140 (61.6%)	2583 (38.4%)	6723 (100.0%)

Note. Pearson's Chi Square $X^2 = 36.355$, $df = 5$, $p < .001$. However, it is noted that 2 cells had expected counts less than 5 with a minimum expected count of 1.92.

The following conclusions were made related to race and gender of the driver and day versus night stops (RQ4), as revealed from the data:

- Asian drivers were 1.5 times more likely to be stopped at night versus White and Hispanic/Latinx drivers.
- Black male drivers were 1.4 times more likely to be stopped at night versus White and Hispanic/Latinx drivers.
- Asian male drivers were 1.63 times more likely to be stopped at night versus White and Hispanic/Latinx drivers.
- Black female drivers were 1.22 times more likely to be stopped at night White and Hispanic/Latinx drivers.
- Asian female drivers were 1.21 times more likely to be stopped at night White and Hispanic/Latinx drivers.

Black males represented 12% of the nighttime stops or 725 stops. Black females were stopped 421 times or 6.97% of the nighttime stops. Table 4 illustrates the VOD analysis highlighting male, female, Black male, and Black female statistics.

Table 4

Veil of Darkness Analysis by Gender and Black Race

Model Specification	n	Percentage Stopped
Model 1: Male only	4,071	67.47%
Model 2: Female only	1,934	32.05%
Model 3: Black males	725	12.00%
Model 4: Black females	421	6.97%

Discussion

The discussion of the results provides an understanding of the findings of the relationships between race, gender, and time of day (nighttime vs. daytime) and stops and outcomes. These results are discussed according to research question.

Question 1: Is there a difference in stops between races in highland by police officers?

The population of Highland Park is divided into 0.1% American Indian or Alaskan Native, 17.8% Asian or Pacific Islander, 7.3% African Americans, 63.6% White/Caucasian, 9%

Hispanic, and 2.2% other; however, overall, African-Americans/Blacks were stopped at a 17.76% rate, while Whites were stopped at a 43.26% rate. The rate among African-Americans was 16.86% in the daytime and 18.99% in the nighttime. Comparatively, Whites were stopped at a rate of 45.89% in the daytime and 39.69% at nighttime.

Question 2. Is there a difference in stops between races in Highland Park Borough by police officers as a function of time of day (day or night)?

Blacks were stopped 1,377 times from sunrise to sunset, while Whites were stopped 3,749 times during the same time period. On the other hand, during the hours of sunset to sunrise, Blacks were stopped 1,146 times, while Whites were stopped 2,395 times. Blacks represented 16.86% of the stops during the daytime and 18.99% of the stops during the nighttime. Whites 45.89% of the daytime stops and 39.69% of the stops at nighttime.

Question 3. Is there is a difference in outcomes of police stops for different races for years 1/01/2014 through 12/31/2018?

For the period of 1/1/2014 through 12/31/2018, Black drivers were stopped 2,569 times, with 43% of these stops, or 1,116 stops, resulting in a summons. Black females were summoned at a rate of 18%, while the rate for Black males was 14.9%. White drivers were stopped 6,144 times, or 43.26% of the time, with 62% of these stops resulting in 3,780 summonses being issued. Finally, *no other action, or warnings* were documented by police officers for a total of 6,723 stops. In all, 47% of the time, there was a warning, or no action taken against the motorist. Involving Black drivers, 1,338 warnings were documented or 9.42%, while Whites experienced no other action or warnings 4,140 times or 29.15%. Asians were stopped 3,323 times.

Question 4. Are African-Americans (male or female) disproportionately stopped, summoned, or warned in relationship to other racial groups?

There are significant statistical differences in outcomes when considering gender and race in summons ($p < 0.001$) and warnings ($p = 0.001$), notably for African Americans. HPPD police officers warned African Americans at a higher rate in relationship to the other racial groups. The study suggests that African American/Black and Asian motorist were disproportionately stopped in relationship to their representation in the population. Whites represented 63.3% of the Highland Park population, while Blacks represented 7.3%, and Asians represented 18.8%. African American/Black drivers were stopped at a 17.76% rate, while White drivers were stopped at a 43.26% rate. The rate for African Americans in the daytime and nighttime was approximately 17% to 19%. Comparatively, Whites were stopped in the daytime at a rate of 45.89% and in the nighttime at a rate of 39.69%. These data suggest disproportionality.

Limitations

There were several limitations of this study. One limitation of this study was that the researchers were unable to analyze the locations of traffic stops to understand if there was a difference between Highland Park residents being stopped versus visitors. Other limitations included the following:

- Data collection was very difficult due to the lack of organization between the different databases in order to draw reports from the merged data from both datasets. The collection challenges limited the study timeframe.
- The sample size did not permit implementation of the traditional VOD analysis. The sample size would have been significantly reduced from the 14,203 traffic stops.
- The study did not examine traffic stop data comparing traffic stops of Highland Park Borough residents to non-residents of Highland Park Borough, as noted.
- U.S. Census data may not be the most current data available from which to base this study, as the data were 9 years old. Middlesex County data may have been a stronger benchmark.

Recommendations

This research can and should be extended to include other groups affected by racial profiling. The same methods can be used to identify factors that indicate racial profiling among individuals of Middle Eastern decent at airports. This research could also elicit perceptions of racial profiling in states that have recently passed anti-illegal immigration laws, such as Arizona's Senate Bill #1070. This law requires aliens 14 years of age or older, who are in the U.S. longer than 30 days to register with the U.S. government and have the registration documents in their possession (Title 8, US Code). The law makes it a misdemeanor to be in Arizona without carrying the required documents.

It is also recommended that researchers engaging in this subject matter subject police officers to this type of study. Perhaps not so evident is understanding what officers perceive as racial profiling versus what minority citizens perceive as racial profiling. Most evidently, the research in this arena should extend to theories in both social learning and broken windows to underscore its meaningfulness. The researchers recommend that Highland Park Borough consider the following:

- HPPD develop an algorithm to create reports from InfoCop and Enforcys to capture all demographic data points.
- HPPD engage the services of a data analyst to support data collection, to review and analyze data on a regular basis that can be used to inform deployment decisions and monitor traffic stops, and to report findings to the community annually.

- Future study of traffic stop data controlling for increased daily population during rush hours, such as 7:00 a.m. to 9:00 a.m., and 4:00 p.m. to 6:00 p.m. is recommended. Such a study should include Middlesex County demographics in the study.
- Implicit/Explicit bias training for all HPPD police officers/personnel is recommended to educate staff on the effects of implicit bias.

References

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Appendix: Additional Census and HPPD Stop Data

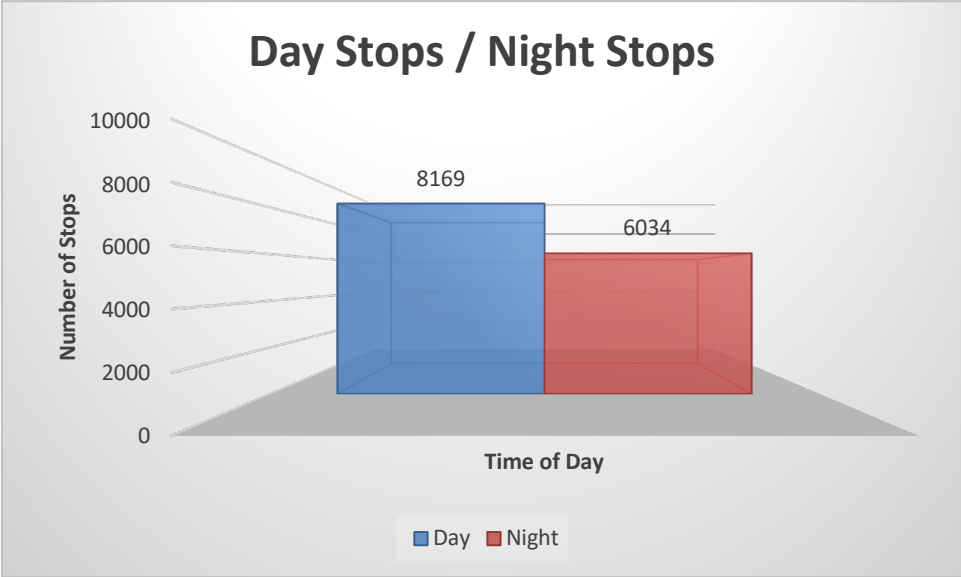


Figure 11. Number of stops by time of day

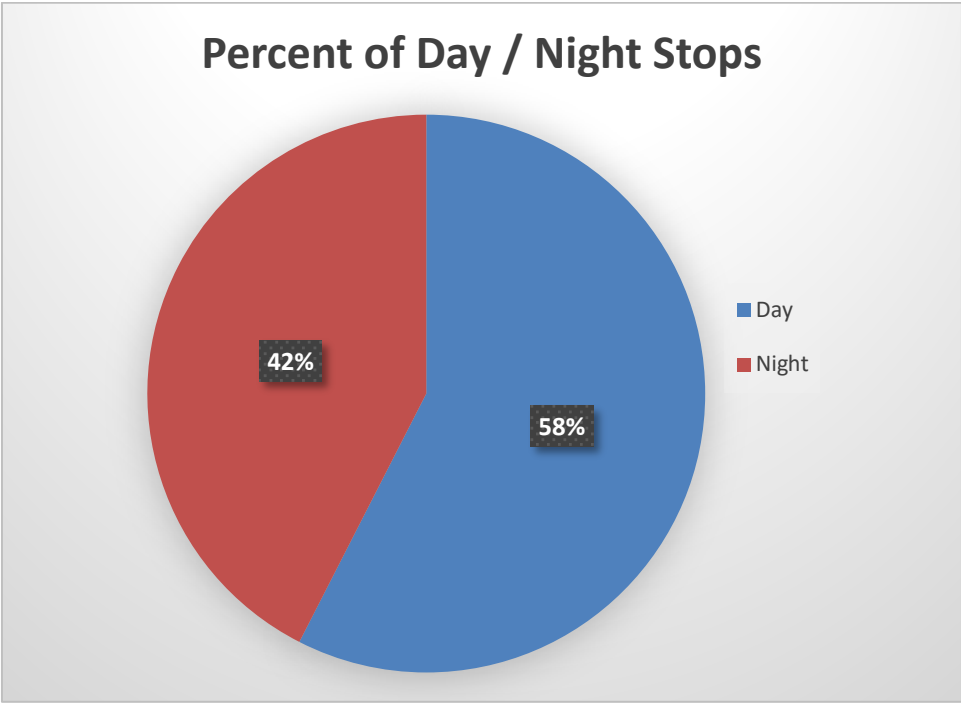


Figure 12. Percentage of stops by time of day

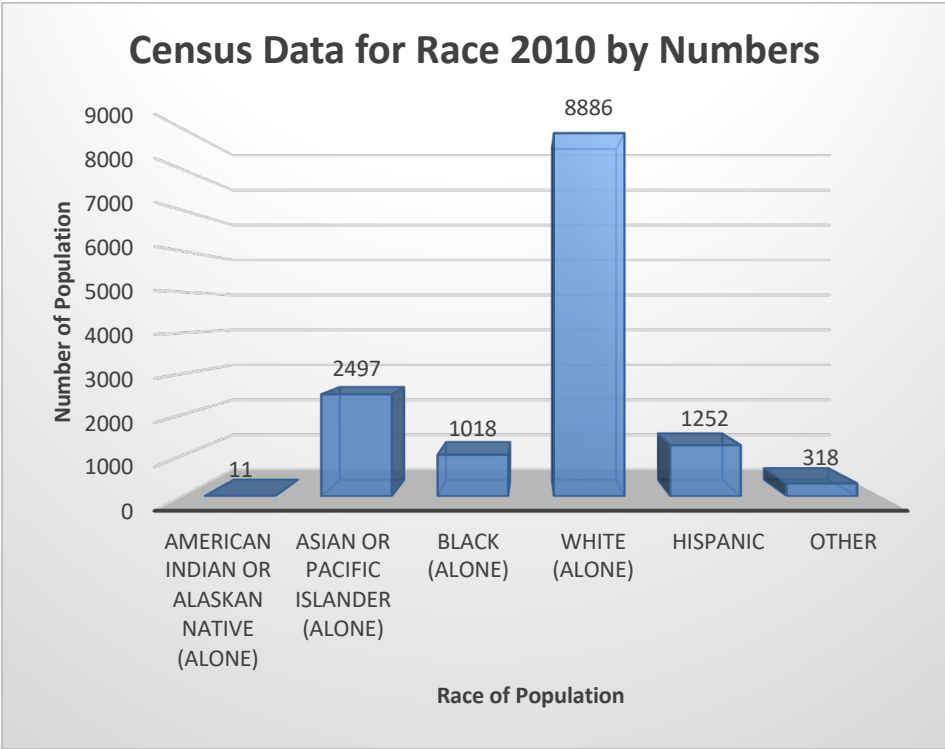


Figure 13. 2010 Census data for race by number

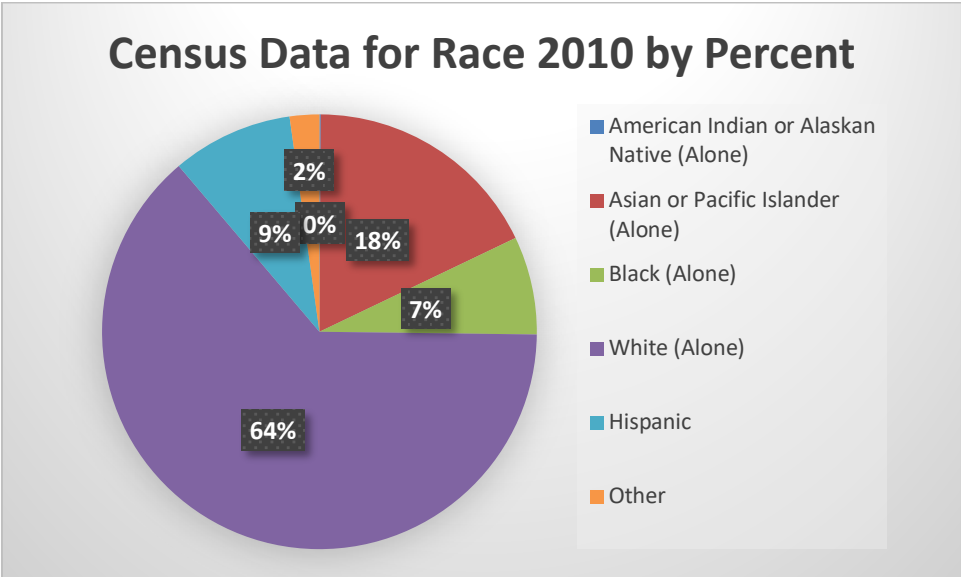


Figure 14. 2010 Census data for race by percent

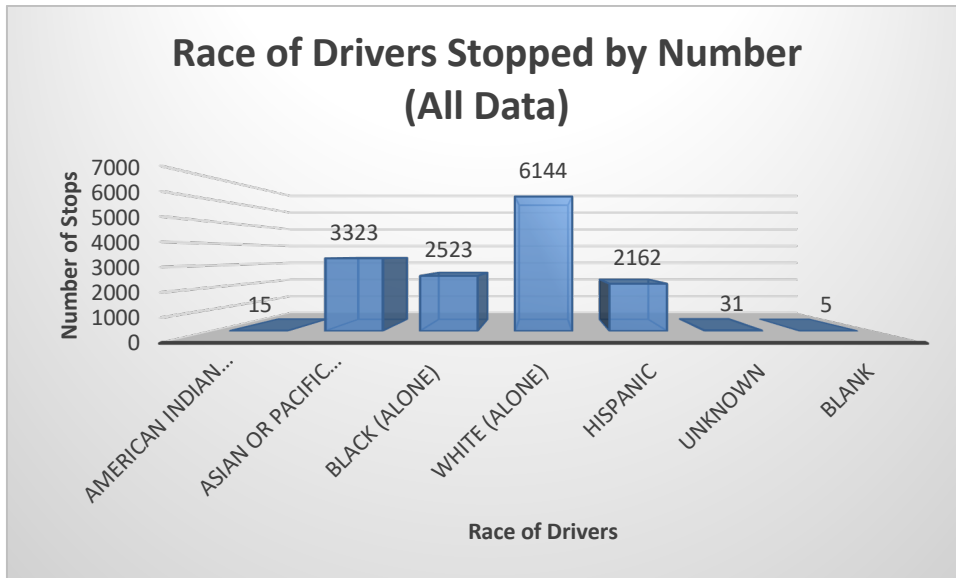


Figure 15. The frequency of all motor vehicle stops (N = 14,203).

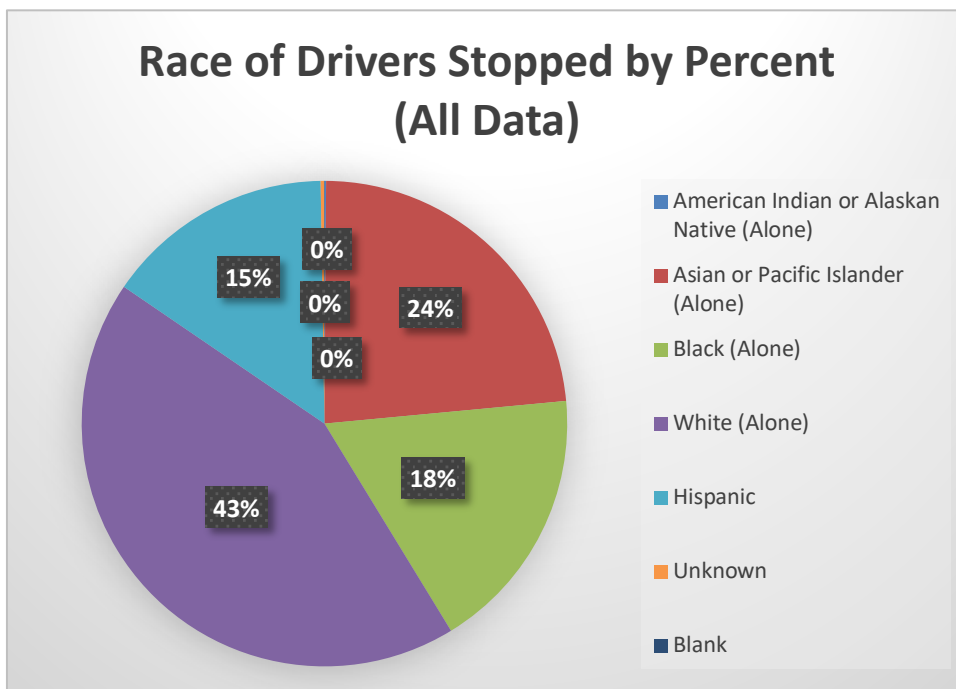


Figure 16. Race of all drivers stopped by percent