Project on Police-Citizen Contacts:
Final Report, 2009

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1. INTRODUCTION

OVERVIEW

This report documents the findings from statistical analyses of data collected during all member-initiated traffic stops by the Pennsylvania State Police (PSP) from January 1, 2009 – December 31, 2009. These data represent the eighth year of data collection for the voluntarily-initiated Project on Police-Citizen Contacts. The remainder of Section 1 summarizes the findings from the most recent previous report (Year 7 - 2008) and an overview of the current Year 8 (2009) Report.

SUMMARY OF THE YEAR 7 (2008) REPORT

Prepared February 2010, the *Year 7 Final Report* (see Engel, Cherkauskas, & Tillyer, 2010) summarized the data collected during the seventh year of data collection, from January 1, 2008 through December 31, 2008. During 2008, there were 278,323 member-initiated traffic stops either recorded on scannable CDR forms or electronically entered via the CDR X-press system and entered into the database for analysis. As of December 2008, over 99% of the data collected was transmitted using the CDR X-press system. Of the 278,323 CDR and CDR X-press forms included in the final data set, only 0.6% had one or more missing or invalid items, which is considerably lower than the recommended 5% error threshold.

This report reviewed a number of statistical analyses including descriptive statistics for traffic stops in 2008, trend analyses of traffic stops and traffic stop outcomes from 2002-2008, an examination of post-stop outcomes, including a focus on searches and search success rates, and a series of recommendations. A brief summary of the major findings from these analyses is provided below:

- **Trends in Racial/Ethnic Characteristics of Drivers Stopped (2002-2008):**
  - Department-wide, the 2008 rate of traffic stops involving Black drivers was more than one standard deviation above the six-year average for that organizational unit. The departmental rate of traffic stops was primarily influenced by rates of Black drivers stopped in Troops R and B, which were more than three standard deviations above their six-year average.
  - Department-wide, the 2008 rate of traffic stops involving Hispanic drivers was within one standard deviation of the six-year average.
  - It is important to note that the following results are descriptive and, even when based on statistical testing, cannot be used to determine the causes of changes in the racial composition of drivers stopped, as they may be due to a number of factors including: 1) changes in the racial/ethnic composition of residential populations serviced by those organizational units which have altered the racial/ethnic composition of drivers eligible to be stopped, 2) alterations to the reporting patterns by PSP troopers, 3) other changes in travel patterns that differentially impact the percentages of minority drivers on particular roadways, 4) adjustments to PSP deployment patterns and manpower allocation to address changes in reported criminal patterns and calls for service, resulting in higher concentrations of Troopers in areas where minorities are

more likely to travel and/or violate the law, and 5) changes across time in Trooper behavior toward minority drivers.

- **Trends in Racial/Ethnic Characteristics of Post-Stop Outcomes Drivers Received (2002-2008):**
  o <u>Warnings:</u> The 2008 warning rate for Black and Hispanic drivers was slightly higher than the warning rate for White drivers. The past three years have seen an increase in the warning rates for White, Black, and Hispanic drivers.
  o <u>Citations:</u> Throughout the seven years of data collection, the citation rate for all groups increased between 2002 and 2004, but has stabilized in the past four years. Hispanic drivers consistently have the highest rate of citations, while White drivers are consistently the least cited group (except 2007).
  o <u>Arrests:</u> The 2008 arrest rate was highest for Hispanic drivers, followed by Black and White drivers, respectively, and the difference between these groups expanded. In all years, Hispanic drivers were arrested at a higher rate than Blacks and Whites, with White drivers generally being arrested the least often.
  o <u>Searches:</u> The 2008 search rate was highest for Hispanic drivers, followed by Black drivers and White drivers, respectively. Consistent across all seven years of data collection are the relative stability of the search rate of White drivers and the large discrepancies in the search rates between minority drivers and White drivers.
  o <u>Seizures:</u> Continuing a trend that has been evident in all seven years of data collection, the 2008 seizure rate was highest for White drivers, followed by Black drivers and Hispanic drivers, respectively.
  o There are a number of possible explanations for these racial disparities in post-stop outcomes. As a result, any interpretation of these findings must be made with caution.

- **Post-Stop Outcomes:**
  - Based on the multivariate analysis of warnings, drivers of "other" race/ethnicity were 1.3 times *less* likely than White drivers to be issued warnings, while Black drivers were 1.1 times more likely than White drivers to be warned. Overall, Troopers' decisions to issue warnings were most strongly based on legal factors like the type and number of reasons for the stop.
  - The multivariate analyses of citations and arrests revealed that Black and Hispanic drivers were *not* significantly more or less likely to be issued citations or arrested compared to White drivers. Instead whether drivers were issued citations or arrested was explained primarily by legal factors like the type and number of reasons for the stop and the discovery of contraband.
  - Multivariate analyses of searches revealed that Black and Hispanic drivers were 3.0 and 2.6 times *more* likely to be searched than White drivers, after controlling for other measured factors. Collectively, these results demonstrate that, unlike warnings, citations, and arrests, racial/ethnic differences exist in the rates of searches that cannot be explained by the legal and extralegal factors captured on the traffic stop forms.

- **Search & Seizure:**

- In 2008, PSP Troopers conducted 3,110 searches (1.1% of all stops), the majority of which were conducted based on driver's consent (64.2%).
- Of the 278,323 traffic stops initiated by PSP Troopers in 2008, 2,126 drivers (0.8%) were asked for consent to search. Black and Hispanic drivers were significantly more likely than White drivers to be asked for consent to search, and Hispanics were significantly more likely than Blacks and Whites to grant consent to search when asked.
  - In 2008, 853 of the 3,110 searches resulted in the seizure of contraband (27.4% success rate). Type II probable cause/reasonable suspicion searches were the most successful in terms of recovering contraband (34.5%), while Type III consent-only searches were the least successful (22.4%). The search success rate for mandatory Type I searches was 26.0%.
- For both probable cause/reasonable suspicion and consent only searches, PSP Troopers were less likely to discover contraband during searches of Black and Hispanic drivers compared to searches of White drivers.

It is important to note that, although portions of these analyses reveal racial/ethnic disparities, these findings cannot be used to determine the exact causes of the trends reported. The comparisons of rates across years are simply descriptive and do not take into account other factors that may contribute to these racial/ethnic differences. For multivariate statistical models, not all factors that might influence officer decision-making can be included. Similarly, the findings regarding search success rates do not take into account other extralegal and legal factors that might explain the racial/ethnic disparities reported. In sum, the interpretation of these findings must be made with caution and cannot determine the legality of and/or the presence of discrimination in individual stops or searches conducted by PSP Troopers.

When the results of this Year 7 Report are viewed in context of the previous reports, there are a number of consistent patterns. First, across these seven years of data, there has been no consistent evidence to suggest that PSP Troopers disproportionately stop minority motorists. Second, there has been continual improvement in the data collection process over time. Third, there has been a continual effort by PSP administrators to promote and measure equitable treatment across racial/ethnic groups. Fourth, nearly all of the racial/ethnic disparities in traffic stop outcomes have decreased and/or been eliminated over time. This is likely due to: 1) increased scrutiny in traffic stops, 2) advances in training, 3) administrative priorities placed on equitable treatment, 4) increased field supervisory oversight, and 5) increased reliability and validity of the traffic stop data itself. And finally, despite the above noted advancements, there has been a persistent findings of racial/ethnic disparities involving discretionary and consent searches, and the seizure of contraband during these searches. This is the only consistently problematic issue uncovered in the data analyses. As a result, the UCPI research team continues to believe the implementation of the following recommendations is necessary to address the lingering racial/ethnic disparities in the PSP search and seizure activities.

- **Recommendations:**
  - **It is recommended that more advanced analyses be conducted at the troop and station levels that will pinpoint the exact locations where the largest racial/ethnic disparities in searches exist.** These types of analyses often cannot be conducted on one year of data because there are too few searches and/or seizures for all racial/ethnic groups within stations to provide meaningful comparisons. It is possible, however, to drill down to the station level when multiple years of data are combined. Therefore, it is the recommendation of this research team that the data from 2006 – 2010 be combined to perform more specific analyses examining searches and seizures at the station level. Once the stations with the highest racial/ethnic disparities in search and seizure rates are identified, the possible explanations regarding these elevated disparities can be examined.
  - **Once the stations with the highest racial/ethnic disparities in search and seizure rates are identified as described above, it is recommended that PSP supervisors conduct focus groups / interviews with PSP Troopers working in those stations to better understand the likely sources for these disparities.** The primary goal for supervisors would be to more specifically discuss and better understand from Troopers' perspectives why there are consistent racial/ethnic disparities in search and seizure rates.
  - **In addition to internally gathering information from PSP Troopers, it is recommended that the commanders of the stations and troops identified be directly interviewed by PSP administrators.** The purpose of these interviews is to gain a better understanding of the patterns and practices within those locations. There are several possible explanations for these elevated rates that can only be determined based on local knowledge of the area and additional information that is not included in the Contact Data Reports.
  - **Continued monitoring of racial/ethnic disparities in traffic stop outcomes, particularly searches and seizures, remains necessary. PSP should continue to collect and analyze traffic stop data.** By comparing multiple years of traffic stop data, it is possible to determine the relative effectiveness of any new policies and training on the rates of searches and seizures of minority drivers. Further, continual monitoring of traffic stops provides valuable information to the organization, while simultaneously institutionalizing a culture within the organization that inspires fair and equitable policing.

It is obvious that PSP officials remain committed to both the traffic stop data collection effort and the larger goals of reducing racial/ethnic disparities in traffic stops and post-stop outcomes. They also have demonstrated the importance of providing legitimate and unbiased policing services to citizens of the Commonwealth of Pennsylvania. This commitment has been demonstrated by their ongoing data collection effort, which is currently in its ninth year, and contractually scheduled through Dec 31, 2011. This report, as well as previous final reports, has documented that racial and ethnic disparities in traffic stops and post-stop outcomes are rare within the PSP. While racial/ethnic disparities in search and seizure rates remain an area of concern, these patterns mirror those reported in multiple jurisdictions across the country. This suggests that rather than individual police officer bias, there are larger cultural and/or organizational explanations for these disparities. Academics and

practitioners around the country are continuing to examine these issues, and the PSP is at the forefront of this important research.

YEAR 8 (2009) REPORT OUTLINE

This report for data collected from January 1, 2009 through December 31, 2009 is divided into eight sections: 1) introduction, 2) traffic stop data collection methodology, 3) description of traffic stop data, 4) trend analyses of stops from 2002 through 2009, 5) trend analyses of stop outcomes from 2002 through 2009, 6) bivariate and multivariate analyses of 2009 post-stop outcomes, 7) searches and seizures, and 8) conclusions and policy recommendations. The general content of Sections 2 - 8 are described below.

Section 2

Section 2 includes a description of the study's methodology, which focuses on the details regarding the collection of traffic stop data by the Pennsylvania State Police. It briefly describes the final police stop dataset that includes 306,256 member-initiated traffic stops in 2009 by summarizing 1) the percentage of stop data submitted by both the CDR X-press system and the scannable CDR form, and 2) the error rate for individual organizational units within the PSP.

Section 3

Section 3 provides descriptive statistics for the traffic stop data collected for the time period from January 1, 2009 – December 31, 2009. This description of data includes the number of stops, characteristics of the stops (e.g., time, day, month, roadway type, vehicle registration, number of passengers, length of the stop), the reason for the stop (e.g., speeding, moving violation, equipment or inspection violation, etc.), the characteristics of the drivers (e.g., gender, race, age, residency), and the percent of traffic stops resulting in various post-stop outcomes including warnings, citations, arrests, searches, and seizures. The averages for this information are reported in tables at the department, area, troop, and station levels.

Section 4

Section 4 examines data collected over the eight years of the research project (i.e., May 2002 – December 2009) and documents the stopping trends of Black and Hispanic drivers by PSP Troopers across the department and troop levels during this time period. These temporal trends are assessed using a standard deviation methodology. In contrast to previous reports, these trends are not provided at the area level, due to the reorganization that occurred within the PSP in 2008 that altered the composition of Areas I through V from previous years.

Section 5

Section 5 reports the temporal trends for warnings, citations, arrests, searches, and seizures between 2002 and 2009. Using the standard deviation methodology described in Section 4, the 2009 rate of all traffic stop outcomes are compared to the seven-year average at the

department level. Thereafter, the rate of traffic stop outcomes is reported within racial/ethnic groups at the department level. Finally, the rate of traffic stop outcomes for different racial/ethnic groups between 2002 and 2009 is reported at the troop level for all traffic stop outcomes. Again, due to the department's reorganization in 2008, these trend analyses are not performed at the area level as they were in previous reports.

Section 6

The analyses of post-stop outcomes (e.g., warning, citation, arrest, and search) are documented in Section 6. Driver differences, based on race/ethnicity and gender, are examined for all post-stop outcomes. Following this, several hierarchical multivariate analyses that isolate factors associated with officer decision-making regarding traffic stop outcomes (e.g., warnings, citations, arrests, and searches) are presented. Specifically, Section 6 documents whether these outcomes differ significantly based on a multitude of factors, including: driver characteristics, vehicle characteristics, stop characteristics, legal variables, Trooper characteristics, and community characteristics.

Section 7

Section 7 focuses specifically on search and seizure activity of the PSP. This focus is conducted due in part to the consistent findings of previous years' reports that the largest racial/ethnic disparities in outcomes occur as the result of searches. Section 7 documents the search rates for minority drivers compared to Whites, and further describes the racial/ethnic disparities in searches and seizures at multiple organization levels. Comparisons of probable cause/reasonable suspicion search success rates are made, followed by analyses specifically of consent searches.

Section 8

Section 8 summarizes the information presented and provides policy recommendations based on interpretations of collected data. Note that the findings reported in this document must be interpreted cautiously. The data collected and presented in this report cannot be used to determine whether or not PSP Troopers have individually or collectively engaged in "racial profiling." In addition, the legality of prior or future individual traffic stops cannot be assessed with these data. This report is designed to give feedback to PSP administrators regarding the status of the ongoing data collection process, along with exploring trends and patterns in the data that may be utilized for training purposes.

Appendix A

Appendix A utilizes a series of figures to document the stopping trends of Black and Hispanic drivers by PSP Troopers at the station level between 2002 and 2009. This information is intended to supplement the information in Section 4 regarding the stopping trends of Black and Hispanic drivers at the department and troop level.

Appendix B

Appendix B provides a series of figures that report the rates of post-stop outcomes (e.g., warnings, citations, arrests, and searches) at the station level between 2002 and 2009. It is intended to supplement the information provided in Section 5 at the department and troop level.

2. TRAFFIC STOP DATA COLLECTION METHODOLOGY

OVERVIEW

This section documents the methodology utilized for the data collection effort, including a brief description of the information collected on all trooper-initiated traffic stops through the CDR X-press system or the Contact Data Report (CDR) form. Additional tables summarize the total number of traffic stops, the percent of data received through the CDR X-press system and on the CDR forms, as well as the overall error rate for all data by month. This information is also presented for the entire year across the department, area, troop, and station levels.

DATA COLLECTION

Throughout 2009, PSP personnel collected data on all trooper-initiated traffic stops. From January 1, 2009 – December 31, 2009, data were collected on 306,256 stops. This information was primarily collected using the CDR X-press system with the remainder of the information collected using the Contact Data Report (CDR) form. Both data collection instruments gathered similar information on the following items:

- The Traffic Stop
    - Date/Time [month, day, hour]
    - Location [county and municipality identifiers]
    - Type of Roadway [interstate, state highway, county/local road, other]
    - Reason(s) for the Stop [speeding, other moving violation, equipment/Inspection, pre-existing information, registration, license, special traffic enforcement, other]
    - Duration [1-15 minutes, 16-30 minutes, 31-60 minutes, 61+ minutes]
    - Outcome [written warning, citation, arrest, search]
        - Consent Search Requested
        - Reason(s) for Search [consent, odor of drugs/alcohol, plain view, incident to arrest, canine alert, inventory, probable cause, search warrant, other]
        - Property seized during a search [cash, drugs, vehicle, weapons, stolen property, alcohol, other]
- The Driver
    - Gender [male, female]
    - Age [in years]
    - Race/Ethnicity [White, Black, White Hispanic, Black Hispanic, Native American, Middle Eastern, Asian/Pacific Islander, unknown]
    - Zip Code of Residency
- The Vehicle
    - State of Registration
    - Number of Passengers
- The Trooper
    - Station Identifier
    - Employee Identifier

Table 2.1 reports the monthly number of traffic stops in the data set based on information received from the CDR X-press system and the CDR forms. The rate of information received through these two methods is also reported by month for the entire department. The final column provides the collective error rate by month for both data sources. The error rate is the product of an internal auditing process in which all the data is checked for invalid / missing entries and logical inconsistencies. Maintaining data quality is essential for traffic stop data collection efforts. The Police Executive Research Forum (PERF) has devised a set of guidelines to aid police departments in the collection of traffic and pedestrian stop data (for details, see Fridell, Lunney, Diamond, & Kubu, 2001). PERF recommends a missing data rate of less than 10%, while our research team recommends a more stringent standard of less than 5% missing data.

Between January 1, 2009 and December 31, 2009, information on 306,256 traffic stops was reported using the CDR X-press system or CDR forms. Over 99% of that information was transmitted using the CDR X-press system. The department-wide error rate was 2.0%, which is considerably lower than the recommended 5% but reflects an increase from 0.6% in 2008. This error rate was associated mostly with changes to the data collection system and various adjustments made to that system. These minor fluctuations in error rates are to be expected when new data collection procedures are tested and implemented. The department's error rate in 2009 is consistently under the research team's recommended standard of less than five percent.

In 2009, half of the months accounted for between 20,000 and 30,000 traffic stops each. March accounted for the largest number of traffic stops (n=36,420), while October showed the smallest number of traffic stops (n=14,867) in the data set. Over the twelve months, the rate of traffic stops reported using the CDR X-press system was never less than 99.8% and culminated in 100% of the data received using this method by December. The overall error rate was 2.0%, with most months experiencing around a 0.5% error rate. The error rates in July and August, however, are noticeable outliers from the other months' rates. These inflated error rates are attributed to a higher-than-average amount of missing and/or invalid employee numbers, but should not impact the overall analyses contained within this report. The data collection and transfer issues identified were quickly corrected by PSP officials.

Table 2.1: 2009 Traffic Stops by Month (CDR X-press vs. CDR)

Time Period	Total # in Dataset	% CDR X-press	% CDR	% Errors
2009 Total	306,256	99.9	0.1	2.0
January	17,515	99.9	0.1	0.5
February	20,854	99.9	<0.1	0.4
March	36,420	99.9	0.1	0.5
April	27,742	99.9	<0.1	0.5
May	35,797	99.9	<0.1	0.5
June	26,301	99.9	<0.1	0.6
July	25,404	99.9	<0.1	2.8
August	24,663	99.9	0.1	16.1
September	31,565	99.8	0.2	0.4
October	14,867	99.9	0.1	0.6
November	28,370	99.9	0.1	0.5
December	16,758	100.0	0.0	0.7

Table 2.2 presents the total number of traffic stops, rate of data received by CDR X-press and CDR forms, and the error rate by department, area, troop, and station.[1] Across the areas, Area III conducted the largest number of member-initiated traffic stops (n=72,624) and accounted for just less than 25% of all traffic stop activity. The rate of CDR X-press usage varied slightly, but all areas exceeded 99% usage. Area II exhibited the lowest error rate of 1.4%, but no area reported more than a 3.0% error rate. Across all areas, the 2009 error rates are higher than in 2008 and are largely attributed to the increase in missing and/or invalid employee numbers. Slightly greater variation in these rates is evident at the troop and station levels. At the troop level, nearly all organizational units using the CDR X-press form exclusively showed an error rate of approximately 2% or less in 2009. At the station level, however, great variation in the error rates exists, ranging from a low of 0.3% in Schuylkill Haven, Hazleton, Shickshinny, and Chambersburg to a high of 6.2% in Belle Vernon.[2] Nevertheless, approximately two-thirds of all stations recorded error rates of 2.0% or less.

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[1] Due to a departmental reorganization that occurred in 2009, the organization of all tables in this report has been modified from previous years' reports to reflect the new area and bureau commands. The former organization was: Area I – Troops H,J,L,T; Area II – Troops F,P,R; Area III – Troops A,B,G; Area IV – Troops C,D,E; Area V – Troops K,M,N. The revised organization utilized throughout this report is: Area I - Troops J,K,L,M; Area II- Troops F,N,P,R; Area III-Troops A,G,H; Area IV- Troops C,D,E,B; Bureau of Patrol - Troop T.

[2] Although the error rate in Highspire was 100%, this was based on only 14 stops; therefore, it is not included in this comparison.

Table 2.2: CDR Scan Form Report - 2009 (p. 1 of 3)

	Total # in Dataset	% CDR X-press	% CDR	% Errors
PSP Dept.*	306,256	99.9	0.1	2.0
AREA I	55,865	99.7	0.3	1.7
Troop J	13,680	100.0	0.0	1.6
Avondale	3,236	100.0	0.0	0.8
Embreeville	4,221	100.0	0.0	2.5
Ephrata	1,649	100.0	0.0	1.2
Lancaster	4,574	99.9	0.1	1.5
Troop K	16,650	100.0	0.0	2.0
Media	4,346	100.0	0.0	1.4
Philadelphia	9,825	100.0	0.0	2.5
Skippack	2,479	100.0	0.0	0.8
Troop L	10,954	98.9	1.1	1.6
Frackville	2,263	100.0	0.0	3.9
Hamburg	1,456	91.5	8.5	0.7
Jonestown	3,465	100.0	0.0	1.6
Reading	1,973	99.9	0.1	0.6
Schuylkill Haven	1,797	100.0	0.0	0.3
Troop M	14,581	99.8	0.2	1.7
Belfast	2,673	99.3	0.7	1.9
Bethlehem	1,387	99.4	0.6	1.2
Dublin	2,865	100.0	0.0	1.3
Fogelsville	3,555	100.0	0.0	2.5
Trevose	4,101	100.0	0.0	1.3
AREA II	47,286	100.0	0.0	1.4
Troop F	21,802	100.0	0.0	1.8
Coudersport	1,882	100.0	0.0	1.1
Emporium	1,077	100.0	0.0	1.7
Lamar	3,550	100.0	0.0	1.4
Mansfield	2,286	100.0	0.0	3.5
Milton	3,741	100.0	0.0	2.1
Montoursville	3,699	100.0	0.0	0.5
Selinsgrove	3,494	100.0	0.0	1.8
Stonington	2,073	100.0	0.0	2.7

* The total number of stops included in the data set for the whole department is larger than the sum of the forms for each area, troop, or station as some forms were used for special projects and others had invalid station codes.

Table 2.2: CDR Scan Form Report - 2009 (p. 2 of 3)

	Total # in Dataset	% CDR X-press	% CDR	% Errors
Troop N	10,602	100.0	0.0	0.7
Bloomsburg	1,857	100.0	0.0	0.5
Fern Ridge	2,489	100.0	0.0	0.6
Hazleton	1,471	100.0	0.0	0.3
Lehighton	1,792	100.0	0.0	0.9
Swiftwater	2,993	100.0	0.0	0.8
Troop P	7,512	100.0	0.0	1.3
Laporte	1,571	100.0	0.0	1.3
Shickshinny	1,113	100.0	0.0	0.3
Towanda	2,088	100.0	0.0	0.7
Tunkhannock	908	100.0	0.0	2.6
Wyoming	1,832	100.0	0.0	1.9
Troop R	7,370	100.0	0.0	1.7
Blooming Grove	1,875	100.0	0.0	0.6
Dunmore	1,887	100.0	0.0	2.0
Gibson	2,266	100.0	0.0	2.7
Honesdale	1,342	100.0	0.0	1.3
AREA III	72,624	100.0	0.0	1.5
Troop A	18,055	100.0	0.0	1.2
Ebensburg	4,008	99.9	0.1	0.7
Greensburg	4,110	100.0	0.0	1.8
Indiana	4,363	100.0	0.0	0.9
Kiski Valley	3,308	100.0	0.0	1.6
Somerset (A)	2,266	100.0	0.0	0.7
Troop G	30,575	100.0	0.0	1.8
Bedford	3,829	100.0	0.0	1.5
Hollidaysburg	2,716	100.0	0.0	1.2
Huntingdon	4,039	100.0	0.0	2.0
Lewistown	5,095	99.8	0.2	1.1
McConnellsburg	5,772	100.0	0.0	2.8
Philipsburg	3,560	100.0	0.0	1.2
Rockview	5,564	100.0	0.0	2.0
Troop H	24,030	99.9	0.1	1.4
Carlisle	6,995	100.0	0.0	2.1
Chambersburg	3,044	100.0	0.0	0.3
Gettysburg	3,312	100.0	0.0	1.4
Harrisburg	2,231	100.0	0.0	1.1
Lykens	1,818	100.0	0.0	0.9
Newport	2,705	98.9	1.1	1.7
York	3,925	100.0	0.0	1.4

Table 2.2: CDR Scan Form Report - 2009 (p. 3 of 3)

	Total # in Dataset	% CDR X-press	% CDR	% Errors
AREA IV	69,192	100.0	0.0	2.4
Troop C	18,510	100.0	0.0	1.8
Clarion	2,377	100.0	0.0	1.1
Clearfield	4,148	100.0	0.0	2.3
Dubois	3,365	100.0	0.0	1.6
Kane	2,056	100.0	0.0	3.3
Punxsutawney	2,435	100.0	0.0	1.2
Ridgway	2,588	100.0	0.0	1.3
Tionesta	1,541	100.0	0.0	2.1
Troop D	15,928	100.0	0.0	1.9
Beaver	3,380	100.0	0.0	0.8
Butler	3,996	100.0	0.0	1.8
Kittanning	2,581	100.0	0.0	3.3
Mercer	3,107	100.0	0.0	2.9
New Castle	2,864	100.0	0.0	0.8
Troop E	19,221	100.0	0.0	3.1
Corry	1,448	100.0	0.0	0.9
Erie	4,897	100.0	0.0	4.6
Franklin	1,907	100.0	0.0	1.2
Girard	3,417	100.0	0.0	3.9
Meadville	6,399	100.0	0.0	3.0
Warren	1,153	100.0	0.0	1.1
Troop B	15,533	99.9	0.1	2.5
Belle Vernon	2,524	100.0	0.0	6.2
Pittsburgh	3,528	100.0	0.0	0.8
Uniontown	4,675	100.0	0.0	1.8
Washington	3,466	99.5	0.5	2.9
Waynesburg	1,340	100.0	0.0	1.7
Bureau of Patrol	61,127	100.0	0.0	2.6
Troop T	61,127	100.0	0.0	2.6
Bowmansville	9,345	100.0	0.0	2.8
Everett	14,047	100.0	0.0	2.4
Gibsonia	4,505	99.9	0.1	1.9
Highspire	14	100.0	0.0	100.0
King of Prussia	8,904	100.0	0.0	2.8
New Stanton	6,600	100.0	0.0	3.2
Newville	7,428	100.0	0.0	1.6
Pocono	5,299	100.0	0.0	3.5
Somerset (T)	4,985	100.0	0.0	2.9

SECTION SUMMARY

Between January 1, 2009 and December 31, 2009, information was transmitted on all officer-initiated traffic stops through the CDR X-press system or by the paper CDR form. The information collected included stop, driver, vehicle, and officer characteristics. Regardless of the method of transfer from PSP to the research team, all information was collated into one data set for analysis.

In 2009, 306,256 traffic stops were initiated by PSP personnel and over 99% of that information was recorded using the CDR X-press system. The overall error rate across the department for traffic stops with incorrect, missing, or contradictory information was 2.0%, which is considerably lower than the recommended rate of 5%. Although this error rate is well within acceptable limits, it does represent an increase from 2008. The data collection and transfer issues associated with this increased error rate were quickly identified and corrected by PSP officials. The analyses and findings within this report are unaffected by these minor errors.

In 2009, half of the months accounted for between 20,000 and 30,000 traffic stops each. Over the twelve months, the rate of traffic stops reported using the CDR X-press system was never less than 99.8% and culminated in 100% of the data received using this method by December. The overall error rate was 2.0%, with most months experiencing around a 0.5% error rate. The error rates in July and August, however, are noticeable outliers from the other months' rates. These inflated error rates are attributed to a higher-than-average amount of missing and/or invalid employee numbers that occurred for reasons unknown to the research team. In addition, Area II exhibited the lowest error rate of 1.4%, but no area reported more than a 3.0% error rate. Slightly greater variation in these rates is evident at the troop and station levels. The majority of organizational units using the CDR X-press form exclusively showed an error rate of approximately 2% or less in 2009.

3. DESCRIPTION OF TRAFFIC STOP DATA

OVERVIEW

All trooper-initiated traffic stops reported with valid outcomes conducted between January 1, 2009 and December 31, 2009 are examined in this section (n=306,256). All descriptive statistics are reported at multiple organizational levels. First, the characteristics of traffic stops are reported, including the total number of stops, percentage of stops by weekday, daytime hours, work shift, roadway type, Pennsylvania registration, number of passengers, and duration of the stop. Table 3.1 reports these characteristics at the department, area, and troop level, while Table 3.2 summarizes this information at the station level. Table 3.3 reports the percent of traffic stops by month for all organizational units. Tables 3.4 & 3.5 report the reasons for traffic stops at the area, troop, and station level. Second, the characteristics of drivers involved in trooper-initiated traffic stops are reported, including drivers' age, gender, race/ethnicity, and residency. Tables 3.6 & 3.7 report this information at the department, area, troop, and station levels. Finally, the percentage of stops resulting in warning, citations, arrests, and searches are reported across all organizational units in Tables 3.8 – 3.10.

TRAFFIC STOP CHARACTERISTICS

A variety of traffic stop characteristics are summarized in Tables 3.1 and 3.2 below, including total number of stops, percent of stops occurring on weekdays, percent of stops occurring during daytime hours, percent of stops by shift, percent of stops by roadway type, percent of Pennsylvania registered vehicles, average number of passengers per vehicle, and percent of traffic stops by their duration. Table 3.3 reports the monthly percentages of traffic stops at different organizational levels. Tables 3.4 and 3.5 report the reasons for traffic stops both "prior to" and "subsequent to" the stop are reported. These reasons include: 1) speeding, 2) other moving violations, 3) equipment violations, 4) pre-existing information, 5) registration violations, 6) license violations, 7) special traffic enforcement programs, and 8) "other" reasons not previously indicated. The average speed over the limit observed for traffic stops initiated for a speeding violation is also reported across all organizational levels.

Traffic Stop Descriptives

In 2009, PSP personnel collected valid information during 306,256 member-initiated traffic stops throughout the entire state. At the department level, the majority of traffic stops were initiated on a weekday (68.4%) and during the daytime (74.3%). The day shift (7:00 am – 3:00 pm) accounted for the highest percent of traffic stops (49.9%). Over half of the traffic stops occurred on a state highway (52.3%), while 44% occurred on interstates. More than three-fourths of the vehicles stopped (78.8%) were registered in Pennsylvania and, on average, contained 0.7 passengers (the majority of vehicles stopped were single occupants). Nearly ninety percent (89.9%) of the traffic stops were completed within 15 minutes. Table 3.1 reports these characteristics at the department, area, and troop level, while Table 3.2 summarizes this information at the station level.

Table 3.1: 2009 Traffic Stop Descriptives by Department, Area & Troop

	Total # of Stops	% Weekday	Time of Stop % Daytime	Shift % 7-3	% 3-11	% 11-7	% Inter	Roadway Type % State	% Local	% Other	Regist. % PA	Passengers Avg/vehicle	Duration of Stop (minutes) % 1-15	% 16-30	% 31-60	% 61+
PSP Dept.	306,256	68.4	74.3	49.9	41.1	8.9	44.0	52.3	0.0	3.7	78.8	0.7	89.9	8.8	0.9	0.5
AREA I	55,865	68.9	69.9	47.4	39.3	13.3	33.6	59.9	0.0	6.4	87.9	0.6	84.2	13.6	1.7	0.5
Troop J	13,680	68.9	69.4	48.1	39.5	12.4	0.1	93.2	0.0	6.7	95.3	0.6	84.8	13.0	1.5	0.6
Troop K	16,650	68.5	67.6	44.3	36.4	19.2	50.8	41.1	0.0	8.1	85.5	0.5	85.3	12.2	2.0	0.5
Troop L	10,954	68.7	75.8	50.8	40.9	8.3	37.0	57.6	0.1	5.3	83.8	0.6	87.4	11.1	1.0	0.6
Troop M	14,581	69.6	68.4	47.5	41.2	11.3	44.1	50.7	0.0	5.2	86.8	0.6	80.1	17.5	2.0	0.4
AREA II	47,286	66.4	77.4	53.7	40.2	6.1	34.2	63.3	0.0	2.5	76.2	0.7	87.6	11.2	0.9	0.3
Troop F	21,802	65.8	77.3	54.2	41.2	4.7	21.7	76.0	0.0	2.3	79.5	0.8	93.1	6.0	0.7	0.2
Troop N	10,602	68.2	76.7	55.0	36.6	8.3	53.1	43.6	0.0	3.4	72.5	0.8	85.0	13.5	0.9	0.5
Troop P	7,512	65.6	76.9	49.9	42.5	7.6	16.5	81.5	0.0	2.0	88.8	0.6	89.6	9.6	0.6	0.2
Troop R	7,370	66.4	79.3	54.4	40.0	5.5	62.4	35.2	0.0	2.5	58.8	0.8	73.1	24.8	1.6	0.4
AREA III	72,660	69.1	72.6	49.1	42.2	8.6	27.2	68.1	0.0	4.7	84.3	0.7	92.5	6.5	0.6	0.4
Troop A	18,055	68.5	77.9	52.1	42.2	5.7	.2	94.3	0.0	5.5	95.1	0.6	92.9	5.8	0.6	0.7
Troop G	30,575	68.1	74.0	50.5	43.4	6.0	39.0	58.6	0.0	2.3	78.2	0.8	94.4	4.9	0.5	0.3
Troop H	24,030	70.6	67.0	45.2	40.6	14.2	32.7	60.2	0.0	7.1	83.9	0.6	89.8	9.1	0.8	0.3
AREA IV	69,192	69.1	76.5	52.6	39.9	7.5	38.5	57.8	0.0	3.8	79.8	0.7	91.7	6.8	0.8	0.7
Troop C	18,510	66.1	75.9	49.4	43.9	6.6	42.2	56.0	0.0	1.8	67.6	0.9	93.0	6.2	0.6	0.3
Troop D	15,928	67.0	78.4	54.9	39.1	6.0	22.4	73.1	0.0	4.5	87.6	0.6	91.7	6.7	0.9	0.7
Troop E	19,221	69.8	73.0	50.6	40.3	9.2	37.4	58.8	0.0	3.9	81.7	0.7	89.9	8.0	0.9	1.3
Troop B	15,533	74.0	79.6	56.4	35.6	8.0	51.8	42.9	0.0	5.2	84.2	0.6	92.4	6.0	0.9	0.6
Bureau of Patrol	61,127	68.1	75.5	47.4	43.6	8.9	87.8	11.3	0.0	1.0	65.1	0.8	91.7	7.5	0.5	0.3
Troop T	61,127	68.1	75.5	47.4	43.6	8.9	87.8	11.3	0.0	1.0	65.1	0.8	91.7	7.5	0.5	0.3

Table 3.2: 2009 Traffic Stop Descriptives by Station (p. 1 of 4)

	Total # of Stops	% Weekday	Time of Stop % Daytime	Shift % 7-3	% 3-11	% 11-7	Roadway Type % Inter.	% State	% Local	% Other	Regist. % PA	Passengers Avg/vehicle	Duration of Stop (minutes) % 1-15	% 16-30	% 31-60	% 61+
AREA I																
Troop J																
Avondale	3,236	75.7	72.0	46.2	42.3	11.5	0.2	89.4	0.0	10.4	89.2	0.5	74.7	22.4	2.3	0.6
Embreeville	4,221	62.7	66.7	44.7	40.5	14.8	0.0	98.0	0.0	1.9	97.4	0.6	89.0	9.4	1.1	0.5
Ephrata	1,649	67.9	63.6	48.3	41.1	10.7	0.1	89.1	0.0	10.8	96.5	0.6	90.4	7.0	1.9	0.8
Lancaster	4,574	70.3	72.2	52.7	35.9	11.3	0.2	92.8	0.0	7.1	97.2	0.6	86.2	11.8	1.3	0.7
Troop K																
Media	4,346	73.4	66.4	44.8	41.6	13.7	34.9	57.0	0.0	8.0	90.0	0.5	86.4	11.3	1.7	0.5
Philadelphia	9,825	66.8	66.8	42.3	35.6	22.1	71.2	23.5	0.0	5.3	80.5	0.5	85.2	12.3	2.2	0.3
Skippack	2,479	66.6	72.9	51.6	30.8	17.5	6.9	74.9	0.0	18.2	97.6	0.5	83.6	13.6	1.7	1.2
Troop L																
Frackville	2,263	69.4	82.8	57.3	36.2	6.5	69.4	28.3	0.0	2.3	75.7	0.8	87.3	11.9	0.4	0.4
Hamburg	1,456	69.9	79.0	53.0	41.0	6.0	62.6	29.9	1.0	6.5	64.6	0.7	88.8	10.0	1.0	0.2
Jonestown	3,456	64.7	72.6	49.3	41.6	9.0	43.2	48.0	0.0	8.8	82.2	0.7	82.4	15.0	1.4	1.2
Reading	1,973	69.1	68.4	44.6	44.8	10.6	1.0	95.5	0.0	3.5	98.5	0.4	91.0	7.8	1.1	0.2
Schuylkill Haven	1,797	74.1	79.0	50.4	41.0	8.6	2.8	93.5	0.0	3.7	96.3	0.5	91.9	6.9	0.8	0.4
Troop M																
Belfast	2,673	74.7	74.1	48.1	4632	5.7	32.1	61.3	0.0	6.5	84.1	0.7	82.9	16.0	1.0	0.1
Bethlehem	1,387	60.1	67.8	50.1	35.8	14.1	0.8	90.9	0.0	8.3	94.7	0.5	84.6	12.8	1.8	0.7
Dublin	2,865	72.0	71.6	49.6	42.0	8.4	0.6	94.0	0.0	5.5	99.2	0.5	85.7	12.5	1.5	0.2
Fogelsville	3,555	68.9	61.0	42.5	42.0	15.4	54.9	38.8	0.0	6.3	79.6	0.7	84.6	13.7	1.5	0.3
Trevose	4,101	68.4	69.0	49.1	38.5	12.4	87.8	10.1	0.0	2.0	83.5	0.5	68.9	26.7	3.5	0.9
AREA II																
Troop F																
Coudersport	1,882	64.8	72.7	44.5	48.3	7.2	0.1	98.0	0.0	2.0	84.9	0.7	91.1	8.0	0.5	0.4
Emporium	1,077	67.6	78.6	50.7	45.9	3.4	0.1	97.1	0.0	2.8	93.3	0.7	96.6	3.3	0.1	0.0
Lamar	3,550	66.4	80.4	58.9	37.5	3.6	60.6	38.5	0.0	0.8	62.8	0.9	94.5	4.3	1.0	0.2
Mansfield	2,286	69.7	73.1	53.2	39.6	7.2	1.4	97.9	0.0	0.7	69.6	0.7	95.6	3.5	0.4	0.4
Milton	3,741	64.4	85.2	58.5	38.7	2.8	50.3	48.8	0.0	0.9	67.9	0.9	96.6	3.0	0.4	0.1
Montoursville	3,699	69.0	74.4	54.1	41.5	4.4	18.0	75.3	0.0	6.7	91.7	0.7	85.8	12.9	1.1	0.2

Table 3.2: 2009 Traffic Stop Descriptives by Station (p. 2 of 4)

	Total # of Stops	% Weekday	Time of Stop % Daytime	% 7-3	Shift % 3-11	% 11-7	% Inter.	Roadway Type % State	% Local	% Other	Regist. % PA	Passengers Avg/vehicle	Duration of Stop (minutes) % 1-15	% 16-30	% 31-60	% 61+
AREA II (cont.)																
Selinsgrove	3,494	61.5	79.9	56.8	40.1	3.1	0.0	98.0	0.0	2.0	83.7	0.7	96.1	3.5	0.3	0.1
Stonington	2,073	64.3	66.3	45.8	45.7	8.4	0.0	98.6	0.0	1.3	99.0	0.6	89.7	8.3	1.2	0.7
Troop N																
Bloomsburg	1,857	71.8	74.6	55.7	35.4	8.9	86.1	12.3	0.0	1.7	61.9	0.9	92.2	7.4	0.2	0.1
Fern Ridge	2,489	64.0	76.3	52.2	40.7	7.2	60.9	35.9	0.0	3.2	66.5	0.8	74.0	25.1	0.7	0.2
Hazleton	1,471	64.7	75.3	56.4	31.7	11.8	64.0	31.1	0.0	4.8	72.0	0.8	83.5	14.1	1.9	0.5
Lehighton	1,792	71.9	76.2	49.2	46.7	4.0	1.1	92.5	0.0	6.4	97.4	0.6	80.0	19.0	0.7	0.9
Swiftwater	2,993	69.1	79.3	59.7	30.5	9.8	51.8	46.2	0.0	2.0	69.4	0.9	93.5	4.1	1.1	1.3
Troop P																
Laporte	1,571	62.4	77.6	47.0	47.2	5.8	0.1	99.4	0.0	.4	86.3	0.7	94.5	5.4	0.1	0.1
Shickshinny	1,113	69.5	82.4	55.6	35.0	9.4	0.3	98.3	0.0	1.4	97.0	0.4	86.9	12.2	0.8	0.1
Towanda	2,088	67.2	68.5	42.0	53.4	4.5	0.1	98.7	0.0	1.2	90.5	0.6	88.9	9.6	1.1	0.5
Tunkhannock	908	63.5	69.2	41.6	47.2	11.1	0.2	93.5	0.0	6.3	91.2	0.5	93.2	6.7	0.1	0.0
Wyoming	1,832	65.0	86.2	62.1	28.1	9.8	67.1	30.6	0.0	2.3	82.7	0.5	86.1	13.2	0.6	0.2
Troop R																
Blooming Grove	1,875	71.8	81.8	56.7	38.3	5.0	59.9	37.1	0.0	3.0	61.9	0.7	68.4	29.3	2.1	0.3
Dunmore	1,887	65.6	70.8	46.9	44.6	8.5	78.9	19.5	0.0	1.6	65.2	0.7	77.5	50.7	1.5	0.3
Gibson	2,266	63.2	80.6	57.2	38.0	4.8	75.5	22.5	0.0	2.0	38.7	0.9	69.1	28.7	1.5	0.8
Honesdale	1,342	65.3	85.6	57.1	39.5	3.4	20.4	76.0	0.0	3.6	79.4	0.7	80.4	17.7	1.5	0.4
AREA III																
Troop A																
Ebensburg	4,008	64.9	77.2	52.6	42.2	5.5	0.0	98.4	0.0	1.6	94.5	0.6	94.3	3.8	0.2	1.7
Greensburg	4,110	72.1	76.3	55.1	38.5	6.4	0.3	91.1	0.0	8.1	98.8	0.4	94.1	4.9	0.7	0.4
Indiana	4,363	73.0	76.0	47.0	46.9	6.1	0.2	93.3	0.0	6.6	93.2	0.6	91.8	7.1	0.7	0.2
Kiski Valley	3,308	64.6	80.8	56.0	38.3	8.6	0.0	97.2	0.0	2.8	94.6	0.6	91.8	7.5	0.5	0.2
Somerset (A)	2,266	65.6	81.4	49.7	45.5	4.9	0.4	90.8	0.0	8.7	94.2	0.6	92.3	5.9	0.8	1.0

Table 3.2: 2009 Traffic Stop Descriptives by Station (p. 3 of 4)

	Total # of Stops	% Weekday	Time of Stop % Daytime	Shift % 7-3	% 3-11	% 11-7	% Inter.	Roadway Type % State	% Local	% Other	Regist. % PA	Passengers Avg/vehicle	Duration of Stop (minutes) % 1-15	% 16-30	% 31-60	% 61+
AREA III (cont.)																
Troop G																
Bedford	3,829	69.2	76.9	54.0	40.8	5.2	36.5	60.6	0.0	2.9	75.0	0.8	92.3	5.9	1.3	0.4
Hollidaysburg	2,716	69.0	74.5	50.3	45.5	4.2	65.9	31.4	0.0	2.7	82.9	0.7	78.1	20.8	0.9	0.2
Huntingdon	4,039	68.3	68.4	47.9	45.2	6.9	0.2	97.8	0.0	2.0	98.5	0.6	95.5	3.7	0.3	0.4
Lewistown	5,095	65.8	71.2	47.8	45.4	6.8	0.2	97.6	0.0	2.2	91.4	0.7	95.6	3.6	0.5	0.2
McConnellsburg	5,772	70.7	74.3	48.3	45.0	6.7	63.3	33.2	0.0	3.5	54.5	0.9	98.3	1.4	0.2	0.1
Philipsburg	3,560	65.4	66.5	45.0	44.6	10.4	31.5	65.9	0.0	2.5	84.6	0.7	96.7	2.6	0.2	0.5
Rockview	5,564	68.0	82.6	58.6	38.8	2.6	71.1	28.1	0.0	0.9	71.7	0.8	96.0	3.5	0.3	0.3
Troop H																
Carlisle	6,995	70.7	68.9	45.4	42.7	11.9	50.6	41.1	0.0	8.2	80.7	0.6	91.1	7.2	1.2	0.6
Chambersburg	3,044	74.7	68.8	46.7	40.9	12.3	18.0	66.6	0.0	15.3	94.2	0.6	90.8	8.7	0.4	0.1
Gettysburg	3,312	72.5	72.1	52.2	39.4	8.3	0.3	94.2	0.0	5.5	80.9	0.6	91.5	7.1	1.1	0.3
Harrisburg	2,231	66.0	64.4	43.0	39.7	17.2	52.5	44.7	0.0	2.8	82.8	0.6	88.1	10.4	0.7	0.3
Lykens	1,818	70.7	66.1	45.2	38.9	15.8	0.1	95.3	0.0	4.6	99.4	0.5	94.9	4.3	0.6	0.2
Newport	2,705	65.2	60.1	39.0	32.1	28.9	0.0	99.3	0.0	0.7	71.8	0.7	75.5	24.0	0.5	0.0
York	3,925	72.2	64.8	43.1	44.9	12.0	61.2	31.7	0.0	7.0	85.7	0.5	93.4	5.7	0.9	0.0
AREA IV																
Troop C																
Clarion	2,377	65.4	66.5	43.8	43.3	12.9	72.2	26.1	0.0	1.7	50.6	1.0	85.7	13.2	0.7	0.4
Clearfield	4,148	70.0	80.2	51.7	44.6	3.7	79.2	20.2	0.0	0.6	47.1	1.0	96.6	3.2	0.1	0.1
Dubois	3,365	64.8	78.9	55.5	36.9	7.5	76.1	22.4	0.0	1.5	54.4	0.9	94.4	4.5	0.8	0.4
Kane	2,056	62.6	68.7	44.9	46.3	8.8	1.5	89.9	0.0	8.6	78.8	0.8	93.7	5.6	0.4	0.2
Punxsutawney	2,435	65.4	77.0	49.0	47.1	3.9	6.0	92.7	0.0	1.6	93.5	0.7	93.5	5.5	0.7	0.4
Ridgway	2,588	65.6	77.1	46.9	46.4	6.6	1.4	98.2	0.0	0.4	85.2	0.8	93.1	5.6	1.0	0.3
Tionesta	1,541	65.8	77.8	49.8	45.8	4.4	2.3	97.3	0.0	0.5	92.4	0.6	89.4	9.8	0.5	0.3
Troop D																
Beaver	3,380	68.1	78.2	56.9	35.6	7.5	6.2	90.3	0.0	3.5	88.6	0.5	89.6	9.4	0.7	0.3
Butler	3,996	62.6	73.2	48.7	43.1	8.2	23.1	68.8	0.0	8.1	94.3	0.6	91.7	6.0	1.3	1.1
Kittanning	2,581	68.6	77.5	57.3	35.5	7.2	1.1	98.1	0.0	0.9	97.7	0.5	93.1	4.4	0.8	1.7
Mercer	3,107	62.7	79.4	54.5	42.2	3.3	75.5	21.3	0.0	3.2	65.6	0.9	94.2	4.8	0.8	0.2

Table 3.2: 2009 Traffic Stop Descriptives by Station (p. 4 of 4)

	Total # of Stops	% Weekday	Time of Stop % Daytime	% 7-3	Shift % 3-11	% 11-7	% Inter.	Roadway Type % State	% Local	% Other	Regist. % PA	Passengers Avg/vehicle	Duration of Stop (minutes) % 1-15	% 16-30	% 31-60	% 61+
AREA IV (cont.)																
New Castle	2,864	74.9	85.6	59.4	37.4	3.2	2.1	92.4	0.0	5.5	91.8	0.5	90.0	8.9	0.5	0.6
Troop E																
Corry	1,448	73.3	69.7	45.0	46.1	8.9	1.0	96.1	0.0	2.9	95.4	0.6	91.6	6.3	0.6	1.5
Erie	4,897	76.2	73.3	55.0	34.4	10.6	53.8	40.8	0.0	5.4	66.8	0.7	86.0	11.0	1.0	2.0
Franklin	1,907	67.9	70.3	47.2	46.0	6.8	22.6	67.4	0.0	10.0	86.6	0.8	88.6	10.3	0.8	0.2
Girard	3,417	65.9	70.2	47.7	42.8	9.5	45.3	52.3	0.0	2.4	83.7	0.7	88.4	8.4	1.2	2.0
Meadville	6,399	67.5	78.4	53.8	37.9	8.2	39.7	58.5	0.0	1.8	85.3	0.7	93.4	5.2	0.7	0.6
Warren	1,153	65.5	59.6	34.7	53.4	11.9	1.1	94.4	0.0	4.5	93.0	0.6	90.7	7.2	1.0	1.1
Troop B																
Belle Vernon	2,524	81.8	91.2	70.8	22.6	6.6	69.6	28.8	0.0	1.6	79.8	0.6	96.7	3.0	0.2	0.1
Pittsburgh	3,528	64.8	80.8	62.8	29.6	7.6	73.8	23.4	0.0	2.7	87.8	0.5	95.1	4.2	0.4	0.3
Uniontown	4,675	73.8	68.5	44.6	43.2	12.2	.7	86.6	0.0	12.6	96.5	0.5	89.7	8.3	0.6	1.5
Washington	3,466	78.4	86.8	58.3	37.0	4.7	87.5	10.6	0.0	1.9	73.8	0.6	95.7	3.8	0.3	0.2
Waynesburg	1,340	72.5	74.3	48.3	46.1	5.6	46.5	52.0	0.0	1.5	67.4	0.6	78.3	14.6	6.3	0.8
Bureau of Patrol																
Troop T																
Bowmansville	9,345	69.1	65.2	38.1	40.7	21.2	77.3	22.6	0.0	0.1	65.9	0.8	87.5	11.5	0.5	0.5
Everett	14,047	67.5	79.3	48.2	47.0	4.8	92.5	7.3	0.0	0.2	53.8	1.0	96.5	3	0.3	0.2
Gibsonia	4,505	63.5	81.7	51.2	45.9	2.9	90.8	9.1	0.0	0.1	57.1	0.8	87.7	11.9	0.4	0.1
Highspire	14	78.6	50.0	50.0	21.4	28.6	64.3	21.4	0.0	14.3	100.0	0.5	64.3	28.6	7.1	0.0
King of Prussia	8,904	69.4	63.7	43.9	43.6	12.5	84.2	11.5	0.0	4.2	78.7	0.6	89.3	9.4	0.9	0.4
New Stanton	6,600	70.2	81.2	52.4	38.6	9.0	72.3	27.2	0.0	0.4	79.5	0.7	93.5	5.8	0.6	0.2
Newville	7,428	68.4	81.6	55.2	41.2	3.6	97.0	2.8	0.0	0.2	66.5	0.9	91.7	7.5	0.7	0.1
Pocono	5,299	69.4	80.4	48.1	48.1	3.8	89.4	8.2	0.0	2.4	79.0	0.8	90.4	9.1	0.4	0.2
Somerset (T)	4,985	65.5	77.9	46.8	43.3	9.8	99.2	0.7	0.0	0.1	42.2	0.9	93.3	6.2	0.3	0.3

Traffic Stops By Month

Table 3.3 provides a monthly report of traffic stops for 2009 across all organizational units. March and May accounted for the largest percentage of traffic stops with 11.9% and 11.7% of all traffic stops, respectively. In contrast, October (4.9%), December (5.5%), and January (5.7%) contributed the smallest percentages of traffic stops in 2009. The monthly percentages are also reported at the area, troop, and station levels below.

Table 3.3: 2009 Monthly Breakdown of Traffic Stops By Department, Area, Troop, & Station (p. 1 of 3)

	Total # of Stops	% Jan.	% Feb.	% Mar.	% Apr.	% May	% June	% July	% Aug.	% Sept.	% Oct.	% Nov.	% Dec.
PSP Dept.	306,256	5.7	6.8	11.9	9.1	11.7	8.6	8.3	8.1	10.3	4.9	9.3	5.5
AREA I	55,865	7.3	6.8	11.5	7.6	10.1	8.1	8.4	6.8	11.2	4.6	10.0	7.5
Troop J	13,680	6.7	6.8	11.3	6.4	9.3	9.0	12.0	7.4	11.4	4.0	9.0	6.7
Avondale	3,236	6.9	8.3	10.1	7.5	7.8	9.0	8.4	5.4	13.1	4.2	9.4	10.0
Embreeville	4,221	6.3	5.1	9.8	5.0	9.5	10.0	13.8	10.6	12.2	3.7	8.8	5.2
Ephrata	1,649	3.8	6.6	12.1	6.4	10.0	7.6	9.6	8.2	15.1	4.1	9.3	7.2
Lancaster	4,574	8.1	7.3	13.2	7.0	9.9	8.8	13.6	5.5	8.1	4.2	8.7	5.7
Troop K	16,650	7.8	6.3	10.4	9.4	11.3	7.0	7.4	6.6	10.0	5.0	9.1	9.7
Media	4,346	9.5	7.3	13.1	10.8	9.8	7.4	7.1	7.1	10.3	4.8	6.7	6.0
Philadelphia	9,825	7.8	6.8	9.0	8.0	10.2	7.1	7.6	7.1	9.0	5.5	10.4	11.5
Skippack	2,479	4.4	2.7	10.9	12.3	18.0	6.1	7.1	3.6	13.6	3.7	8.3	9.4
Troop L	10,954	6.9	7.4	11.0	6.4	8.9	7.8	6.3	6.5	13.4	5.1	14.0	6.2
Frackville	2,263	3.7	5.1	14.1	7.2	13.0	11.0	7.6	5.3	13.0	4.6	12.0	3.4
Hamburg	1,456	5.6	6.3	12.9	7.1	10.6	12.6	4.8	4.6	16.1	4.6	10.2	4.5
Jonestown	3,465	9.1	8.5	7.3	4.4	9.1	4.5	6.6	7.0	12.2	6.7	16.3	8.2
Reading	1,973	8.3	8.3	8.1	8.8	6.5	6.9	4.8	8.3	13.0	3.6	15.2	8.3
Schuyl. Haven	1,797	6.2	8.1	15.8	5.7	4.8	7.4	7.0	6.7	15.6	4.7	13.9	5.1
Troop M	14,581	7.5	7.0	13.2	7.7	10.6	8.5	7.9	6.8	10.7	4.4	9.0	6.6
Belfast	2,673	6.8	4.9	11.4	6.6	12.9	10.3	10.1	8.1	12.5	2.8	7.5	6.2
Bethlehem	1,387	10.4	6.7	14.9	7.3	10.5	8.4	9.7	3.5	14.8	1.4	8.7	3.7
Dublin	2,865	6.9	5.8	13.8	8.8	9.4	9.3	6.8	6.2	8.2	4.7	10.5	9.6
Fogelsville	3,555	6.9	9.5	12.1	7.1	10.0	5.4	5.6	8.5	12.3	5.6	10.6	6.4
Trevose	4,101	7.9	7.2	14.5	8.4	10.4	9.6	8.4	6.1	8.5	5.3	7.7	6.0
AREA II	47,286	5.6	7.3	12.8	9.2	13.7	5.7	7.9	6.3	12.6	4.6	10.2	4.2
Troop F	21,802	5.7	8.0	13.9	8.7	12.6	5.7	8.6	7.0	11.3	4.9	9.0	4.6
Coudersport	1,882	4.1	9.2	11.6	10.8	10.8	4.8	6.9	7.3	9.3	8.3	8.6	8.3
Emporium	1,077	5.0	5.4	15.0	8.5	12.8	7.0	6.4	7.8	11.3	5.5	11.0	4.2
Lamar	3,550	8.1	5.1	15.4	11.1	16.6	5.3	7.5	3.7	14.3	4.3	6.0	2.6
Mansfield	2,286	2.3	6.4	12.1	11.2	16.4	4.7	10.9	8.2	11.0	5.6	8.6	2.5
Milton	3,741	6.3	9.8	17.6	7.9	10.9	6.4	7.2	8.8	8.3	3.1	8.3	5.6
Montoursville	3,699	6.6	10.0	12.8	7.8	13.6	5.5	10.0	6.1	10.2	3.4	10.2	3.9
Selinsgrove	3,494	4.7	7.8	12.9	5.9	9.0	5.8	9.9	7.2	12.2	6.1	12.5	6.0
Stonington	2,073	5.7	8.4	12.4	7.7	10.9	6.2	8.5	8.9	13.9	6.0	6.9	4.4

Table 3.3: 2009 Monthly Breakdown of Traffic Stops by Department, Area, Troop, & Station (p. 2 of 3)

	Total # Of Stops	% Jan.	% Feb.	% Mar.	% Apr.	% May	% June	% July	% Aug.	% Sept.	% Oct.	% Nov.	% Dec.
Troop N	10,602	5.8	6.1	10.8	10.9	14.7	4.8	5.9	5.3	13.3	5.0	13.1	4.2
Bloomsburg	1,857	5.5	6.2	12.3	11.3	11.0	4.5	2.1	4.0	17.8	7.4	13.2	4.4
Fern Ridge	2,489	6.0	8.7	12.5	12.6	10.6	4.1	4.1	5.5	12.0	4.5	16.1	3.4
Hazleton	1,471	6.5	3.7	8.4	5.6	17.2	3.9	6.3	5.2	20.3	3.3	16.2	3.3
Lehighton	1,792	5.5	6.8	8.9	10.4	14.5	7.5	6.8	6.8	12.5	5.0	12.5	2.8
Swiftwater	2,993	5.5	4.7	10.8	12.0	19.2	4.6	9.2	5.2	8.8	4.8	9.3	5.9
Troop P	7,512	4.8	8.0	12.4	6.8	15.3	6.9	8.4	5.7	14.0	3.3	10.4	3.9
Laporte	1,571	4.8	5.3	9.9	8.0	16.1	8.2	7.1	5.2	12.9	3.6	12.5	6.2
Shickshinny	1,113	1.1	4.1	16.8	3.4	16.3	5.4	11.2	6.9	15.8	3.1	11.5	4.4
Towanda	2,088	10.8	11.7	12.4	7.1	9.0	7.9	6.1	4.8	11.0	4.4	10.5	4.4
Tunkhannock	908	1.5	5.6	7.9	6.1	21.9	4.2	9.7	6.2	18.7	3.4	13.5	1.2
Wyoming	1,832	2.1	9.6	14.1	7.9	18.1	7.0	9.6	6.2	14.7	1.9	6.3	2.5
Troop R	7,370	6.3	5.9	12.9	10.7	13.4	5.6	8.2	6.2	14.0	4.1	9.6	3.1
Bloom. Grove	1,875	7.9	9.4	16.5	6.8	11.5	5.3	7.0	4.2	12.6	6.4	8.1	4.1
Dunmore	1,887	5.5	4.1	8.4	13.7	15.0	5.1	11.0	8.7	17.6	3.7	6.7	1.2
Gibson	2,266	6.4	6.0	11.7	9.3	15.7	6.0	9.2	5.8	13.6	3.5	10.5	2.4
Honesdale	1,342	4.8	3.4	16.3	14.0	10.1	6.3	4.4	6.0	11.3	2.8	14.9	5.6
AREA III	72,660	5.8	7.2	12.4	9.6	11.9	8.1	6.9	8.5	10.2	4.8	9.0	5.5
Troop A	18,055	6.0	7.7	14.1	8.0	12.1	9.5	6.1	7.8	9.0	4.1	9.8	5.8
Ebensburg	4,008	8.6	10.1	12.8	9.0	11.1	9.1	3.9	6.0	8.6	5.4	11.1	4.3
Greensburg	4,110	7.1	7.4	13.0	7.8	12.5	8.9	6.6	6.6	10.1	4.8	8.7	6.5
Indiana	4,363	3.7	5.6	15.3	8.0	10.8	11.3	8.0	9.4	8.3	4.2	9.3	6.1
Kiski Valley	3,308	5.8	9.1	13.6	7.9	10.6	9.4	6.3	9.5	6.9	2.8	9.7	8.4
Somerset (A)	2,266	4.2	5.6	16.5	7.2	17.4	8.3	5.3	7.5	12.4	2.5	10.3	2.8
Troop G	30,575	4.5	6.6	11.9	10.1	12.1	7.6	8.3	8.7	11.1	5.2	9.6	4.4
Bedford	3,829	5.9	6.6	11.8	10.2	15.4	6.3	9.5	6.4	8.6	4.9	8.3	6.0
Hollidaysburg	2,716	3.8	10.2	14.9	9.2	10.9	4.1	7.0	6.7	11.7	5.7	11.9	3.9
Huntingdon	4,039	3.5	6.8	12.6	10.8	10.5	7.8	9.4	7.4	11.3	5.0	8.4	6.6
Lewistown	5,095	7.3	9.2	12.4	8.9	10.8	8.1	5.6	7.2	11.6	4.4	10.9	3.7
McConnells.	5,772	4.2	3.6	8.2	10.2	12.0	8.7	9.4	12.2	13.2	6.7	7.2	4.3
Philipsburg	3,560	2.6	6.0	10.4	8.1	8.9	7.2	8.3	9.7	15.1	6.2	13.7	3.8
Rockview	5,564	3.4	5.8	14.5	12.0	14.8	8.8	8.5	9.3	7.1	3.8	9.2	2.9
Troop H	24,030	7.4	7.6	11.7	10.3	11.5	7.7	5.8	8.8	10.1	4.7	7.6	6.8
Carlisle	6,995	6.9	7.2	11.5	9.2	10.0	8.0	7.0	11.4	10.1	5.5	8.1	5.1
Chambersburg	3,044	7.2	8.0	15.8	10.6	12.9	6.5	2.9	6.6	9.4	4.4	6.0	9.7
Gettysburg	3,312	6.9	8.4	11.4	8.0	11.1	8.1	8.4	7.7	10.7	4.2	8.7	6.5
Harrisburg	2,231	9.1	6.5	10.8	9.1	14.4	8.5	5.6	11.7	8.7	2.3	6.2	6.9
Lykens	1,818	7.6	9.0	12.0	9.5	12.9	8.1	4.0	6.5	11.4	4.7	7.9	6.2
Newport	2,705	7.6	7.1	12.1	12.3	9.6	5.8	4.0	5.8	12.0	4.1	10.9	8.7
York	3,925	7.6	7.4	9.4	13.7	12.2	8.3	6.1	8.2	8.8	5.9	5.6	7.1

Table 3.3: 2009 Monthly Breakdown of Traffic Stops by Department, Area, Troop, & Station (p. 3 of 3)

	Total # of Stops	% Jan.	% Feb.	% Mar.	% Apr.	% May	% June	% July	% Aug.	% Sept.	% Oct.	% Nov.	% Dec.
AREA IV	69,192	3.8	6.5	12.4	9.3	12.8	10.9	9.0	7.5	9.5	4.5	9.1	4.7
Troop C	18,510	4.1	6.3	10.1	9.5	13.1	10.3	9.2	7.2	10.2	5.2	9.4	5.3
Clarion	2,377	3.2	6.6	10.6	6.1	13.5	9.3	9.3	7.0	12.3	5.8	9.5	6.7
Clearfield	4,148	6.0	6.4	11.2	9.9	10.9	10.3	10.7	8.3	11.2	3.5	7.3	4.3
Dubois	3,365	2.6	6.2	10.2	10.3	14.9	11.7	11.1	6.9	9.2	4.8	7.9	4.3
Kane	2,056	3.0	5.3	10.1	11.6	13.5	6.6	4.1	6.6	8.4	8.7	15.5	6.8
Punxs.	2,435	6.4	6.7	9.3	7.3	14.2	10.6	7.4	6.8	11.6	5.2	9.9	4.8
Ridgway	2,588	3.4	6.0	9.5	8.0	13.6	12.6	11.5	8.0	9.0	4.2	9.3	4.9
Tionesta	1,541	3.4	6.4	8.6	14.7	11.9	9.3	7.0	5.6	8.6	6.9	9.9	7.7
Troop D	15,928	4.9	8.3	17.5	9.8	12.8	9.5	5.9	7.5	8.7	4.4	7.8	3.1
Beaver	3,380	6.4	10.1	15.1	9.6	14.4	8.9	3.8	6.7	8.6	5.6	7.3	3.5
Butler	3,996	4.7	10.5	18.4	9.7	9.7	8.6	9.2	7.0	8.6	3.5	8.6	1.4
Kittanning	2,851	4.3	6.4	21.2	8.6	13.3	12.3	5.5	8.8	6.6	4.7	6.0	2.5
Mercer	3,107	5.3	7.7	14.5	8.2	11.3	7.6	6.6	9.3	10.1	4.5	9.7	5.1
New Castle	2,864	3.5	5.4	18.9	12.7	16.3	10.7	3.3	6.0	9.4	3.7	7.1	3.1
Troop E	19,221	4.3	7.2	12.2	11.2	12.0	10.2	7.8	7.8	10.1	3.7	8.8	4.7
Corry	1,448	3.0	6.6	16.0	10.1	9.5	13.1	4.7	6.7	11.8	1.1	13.2	4.3
Erie	4,897	5.5	6.7	11.1	8.8	13.0	12.3	8.5	9.1	10.0	4.5	7.1	3.4
Franklin	1,907	6.0	8.1	12.7	8.0	12.5	10.4	6.9	6.5	10.6	4.5	11.2	2.5
Girard	3,417	5.0	5.8	11.9	13.6	13.1	9.7	10.0	6.4	8.1	2.2	8.9	5.4
Meadville	6,399	2.6	7.7	12.1	12.9	10.6	8.5	8.1	8.8	10.3	4.5	8.1	5.7
Warren	1,153	5.5	9.5	13.6	10.7	13.4	8.2	2.9	4.8	13.1	2.3	9.5	6.6
Troop B	15,533	1.8	4.2	10.0	6.3	13.5	13.8	13.2	7.3	8.7	4.9	10.3	5.9
Belle Vernon	2,524	2.0	2.6	5.9	3.4	8.8	23.1	30.4	7.2	3.8	3.7	6.8	2.3
Pittsburgh	3,528	1.7	3.9	15.5	14.3	18.5	10.4	4.5	4.6	7.5	4.3	11.0	3.7
Uniontown	4,675	1.9	3.1	4.8	3.4	12.2	6.5	8.3	11.1	14.2	8.1	14.0	12.3
Washington	3,466	1.5	5.4	11.0	4.3	13.8	22.1	18.8	5.3	6.9	2.1	6.8	1.9
Waynesburg	1,340	1.6	8.5	19.3	6.6	13.1	9.3	6.8	6.5	6.5	4.8	10.9	6.0
Bur. of Patrol	61,127	6.4	6.3	10.4	9.3	10.1	9.3	9.4	10.7	8.7	5.7	8.3	5.3
Troop T	61,127	6.4	6.3	10.4	9.3	10.1	9.3	9.4	10.7	8.7	5.7	8.3	5.3
Bowmansville	9,345	5.9	5.2	10.8	9.5	9.4	9.5	9.9	10.4	7.6	6.3	9.0	6.4
Everett	14,047	7.3	5.7	9.3	8.7	10.1	8.7	9.5	11.9	8.1	5.3	9.5	6.0
Gibsonia	4,505	5.0	7.5	9.5	8.5	9.4	11.3	8.6	10.9	9.6	6.7	8.4	5.6
Highspire	14	0.0	7.1	7.1	14.3	0.0	0.0	7.1	0.0	35.7	0.0	28.6	0.0
K. of Prussia	8,904	8.0	7.3	10.9	8.0	9.1	9.7	8.9	10.6	9.3	5.6	6.9	5.6
New Stanton	6,600	3.8	5.5	12.7	11.2	11.4	9.6	9.3	11.7	9.5	5.6	6.5	3.3
Newville	7,428	7.7	7.8	11.7	10.9	9.5	8.3	8.1	7.1	8.9	5.8	9.2	5.1
Pocono	5,299	5.5	7.3	9.3	9.5	10.3	8.0	8.5	11.5	10.3	6.6	7.8	5.4
Somerset (T)	4,985	5.5	5.5	9.0	9.2	13.0	10.8	12.1	10.5	8.4	4.5	7.9	3.5

Reason for the Stop

Information is also collected regarding the reason(s) both "prior to" and "subsequent to" the initiated traffic stop. As reported in Tables 3.4 & 3.5, reasons for member-initiated traffic stops include: 1) speeding; 2) other moving violations; 3) equipment violations; 4) pre-existing information; 5) registration violations; 6) license violations; 7) special traffic enforcement programs; and 8) "other" reasons not previously indicated. In the case of traffic stops initiated for speeding, the average speed over the limit is also recorded. All information is reported at the department, area, and troop levels in Table 3.4, and at the station level in Table 3.5.

In 2009, traffic stops were initiated most frequently due to speeding. Across the department, 69.0% of all traffic stops were initiated due to a speeding violation, with the average speed reported at 19.4 miles per hour over the posted speed limit. Moving violations accounted for 17.4% of the reasons for the stop, and equipment inspections were noted as a reason prior to the stop in 9.0% of all trooper initiated traffic stops. No other reason accounted for more than 5% of the traffic stops as reported.

As shown in Table 3.4, at the area level, speeding was also the most common reason for the stop, and ranged from a high of 81.0% of all traffic stops in the Bureau of Patrol to a low of 56.0% of all traffic stops in Area I. The average speed over the limit ranged from a low of 18.2 miles per hour in Area IV to a high of 22.7 miles per hour in Area I. Moving violations and equipment inspections were the next two most common reasons for traffic stops in each of the areas, respectively. Area I personnel initiated 21.5% of their traffic stops due to moving violations, while the Bureau of Patrol only initiated 13.9% of their traffic stops based on a moving violation. Area I had the highest percent of equipment inspections at 12.3%, whereas the Bureau of Patrol initiated only 4.3% of their traffic stops based on an equipment inspection. All other reasons for the stop at the area level accounted for less than 5% of the traffic stops with the exception of Area I, which initiated 8.1% of their traffic stops for a reason related to registration. The reasons for the stop are reported at the troop level in Table 3.4 and at the station level in Table 3.5. These organizational units demonstrated greater variation in their reasons for the stop.

Table 3.4: Reason for Stop by Department, Area, & Troop - 2009

	Total # of Stops	% Speeding		Amt. over Limit (MPH)	% Moving Violation		% Equipment/ Inspection		% Preexisting Info		% Registration		% License		% Spec. Traf. Enf.	% Other	
		P	S		P	S	P	S	P	S	P	S	P	S	P	P	S
PSP Dept	306,254	69.0	0.0	19.4	17.4	0.0	9.0	2.1	0.1	0.2	4.2	2.0	0.9	3.0	0.8	1.0	2.9
AREA I	55,865	56.0	0.0	22.7	21.5	0.0	12.3	2.5	0.1	0.4	8.1	2.1	1.6	4.9	1.4	2.1	3.9
Troop J	13,680	57.6	0.0	22.1	15.9	0.0	12.2	2.1	0.1	0.2	9.6	1.8	3.3	6.1	0.2	2.0	4.5
Troop K	16,650	45.2	0.0	24.8	29.4	0.0	14.2	2.6	0.1	0.5	9.7	2.0	1.0	5.0	1.1	3.2	4.4
Troop L	10,954	70.1	0.0	19.6	19.8	0.1	5.3	2.3	0.1	0.7	3.9	2.1	0.7	3.2	4.3	1.5	3.4
Troop M	14,581	56.3	0.0	24.3	18.9	0.0	15.4	2.8	0.1	0.3	8.2	2.5	1.3	4.8	0.8	1.4	3.1
AREA II	47,286	66.3	0.0	19.1	19.9	0.0	10.3	2.2	0.1	0.3	3.3	1.8	0.7	2.6	0.6	0.9	3.0
Troop F	21,802	74.6	0.0	18.1	14.8	0.0	7.7	2.3	0.1	0.1	2.9	1.9	0.6	2.7	0.3	0.6	3.1
Troop N	10,602	60.5	0.0	20.7	24.7	0.0	11.5	2.0	0.1	0.9	3.9	1.6	0.7	2.7	0.4	0.7	3.2
Troop P	7,512	57.6	0.0	19.8	24.6	0.0	12.2	2.1	0.2	0.3	3.7	2.1	1.3	2.5	2.1	1.2	3.8
Troop R	7,370	58.7	0.0	19.5	22.9	0.0	14.3	2.2	0.1	0.0	2.9	1.7	0.6	2.4	0.4	1.5	1.6
AREA III	72,660	71.3	0.0	19.2	15.7	0.0	8.7	2.1	0.1	0.3	4.0	1.9	0.9	2.6	0.3	0.8	3.1
Troop A	18,055	59.1	0.0	19.7	22.8	0.0	10.5	3.9	0.2	0.8	6.4	2.2	1.0	3.3	0.4	1.1	4.2
Troop G	30,575	77.0	0.0	19.2	14.2	0.0	7.2	1.5	0.1	0.2	2.2	2.0	0.3	2.3	0.3	0.3	2.5
Troop H	24,030	73.1	0.0	19.0	12.4	0.0	9.1	1.4	0.1	0.2	4.6	1.5	1.5	2.5	0.3	1.1	3.0
AREA IV	69,192	68.5	0.0	18.2	17.3	0.0	9.9	2.3	0.2	0.2	4.3	2.4	1.0	3.2	1.4	1.1	3.4
Troop C	18,510	77.5	0.0	16.9	13.2	0.0	7.9	2.1	0.1	0.1	2.3	2.4	0.5	2.3	0.4	1.4	2.9
Troop D	15,928	64.9	0.0	18.8	12.8	0.0	15.2	2.2	0.2	0.2	5.7	2.3	1.4	3.9	4.8	1.0	3.3
Troop E	19,221	74.0	0.0	17.5	13.5	0.0	8.5	2.3	0.1	0.1	3.9	3.1	0.4	3.5	0.1	1.0	4.9
Troop B	15,533	54.7	0.0	20.9	31.6	0.0	8.7	2.4	0.3	0.2	5.5	1.8	1.8	3.3	0.7	0.8	2.3
Bureau of Patrol	61,127	81.0	0.0	18.6	13.9	0.0	4.3	1.4	0.0	0.1	1.3	2.0	0.3	1.9	0.0	0.4	1.0
Troop T	61,127	81.0	0.0	18.6	13.9	0.0	4.3	1.4	0.0	0.1	1.3	2.0	0.3	1.9	0.0	0.4	1.0

NOTE: P = prior to stop, S = subsequent to stop
NOTE: Reasons for the stop may exceed 100% as more than one reason for the stop may be indicated for a traffic stop.

Table 3.5: Reason for Stop by Station – 2009 (p. 1 of 4)

	Total # of Stops	% Speeding		Amt. over Limit (MPH)	% Moving Violation		% Equipment/ Inspection		% Preexisting Info		% Registration		% License		% Spec. Traf. Enf.	% Other	
		P	S		P	S	P	S	P	S	P	S	P	S	P	P	S
AREA I																	
Troop J																	
Avondale	3,236	41.0	0.0	22.1	26.5	0.0	16.8	2.4	0.1	0.2	10.0	2.6	1.9	8.7	0.2	3.5	3.0
Embreeville	4,221	72.1	0.0	23.3	10.5	0.0	7.3	1.0	0.1	0.1	6.6	1.1	1.5	3.4	0.1	2.9	3.3
Ephrata	1,649	78.4	0.0	21.4	7.9	0.0	7.0	2.7	0.0	0.0	5.3	2.1	1.1	3.8	0.9	0.2	1.7
Lancaster	4,574	48.5	0.0	20.9	16.1	0.0	15.5	2.8	0.2	0.2	13.6	1.7	6.7	7.7	0.0	0.6	7.6
Troop K																	
Media	4,346	34.3	0.0	24.0	38.7	0.0	13.9	2.6	0.3	1.1	14.7	2.0	1.3	5.9	0.2	3.3	4.0
Philadelphia	9,825	47.7	0.0	25.8	26.3	0.0	15.0	2.6	0.1	0.3	8.4	1.3	0.9	4.3	0.5	3.2	3.8
Skippack	2,479	54.7	0.0	22.2	25.3	0.0	11.8	2.4	0.1	0.2	5.9	4.4	1.0	6.5	5.4	2.5	7.7
Troop L																	
Frackville	2,263	70.5	0.0	18.9	20.9	0.0	3.9	3.2	0.0	0.2	3.7	2.7	0.6	4.8	0.4	1.0	4.2
Hamburg	1,456	78.2	0.0	18.8	19.1	0.7	2.7	4.7	0.1	4.1	3.5	1.6	0.1	2.0	16.2	1.0	3.8
Jonestown	3,465	76.7	0.0	19.9	11.8	0.0	6.7	1.6	0.0	0.0	3.6	1.9	0.7	3.2	2.8	2.3	3.4
Reading	1,973	71.0	0.0	20.5	16.2	0.0	6.3	0.6	0.2	0.0	4.6	1.2	0.8	2.1	0.1	2.2	2.0
Schuylkill Haven	1,797	49.2	0.0	19.5	38.0	0.0	5.7	2.5	0.2	0.6	4.1	3.1	1.0	3.4	7.0	0.6	3.9
Troop M																	
Belfast	2,673	58.6	0.0	20.9	15.3	0.0	18.1	2.4	0.0	0.1	7.7	2.2	1.7	4.3	0.0	0.7	1.6
Bethlehem	1,387	62.7	0.1	21.9	19.4	0.0	12.1	3.4	0.2	0.1	5.1	1.9	1.6	5.0	0.5	1.2	4.0
Dublin	2,865	42.1	0.0	21.2	21.6	0.0	23.7	2.3	0.1	0.0	9.1	3.1	1.9	5.2	0.4	1.5	2.9
Fogelsville	3,555	62.3	0.0	24.4	24.0	0.0	10.1	2.4	0.1	0.3	7.5	2.1	0.7	3.5	0.2	1.0	2.8
Trevose	4,101	57.4	0.0	28.9	14.9	0.0	13.6	3.7	0.1	0.7	9.6	3.0	1.1	5.9	2.1	2.0	4.1
AREA II																	
Troop F																	
Coudersport	1,882	70.4	0.0	16.4	8.8	0.0	15.4	1.8	0.2	0.5	3.9	2.3	0.3	3.6	0.1	0.7	3.1
Emporium	1,077	47.7	0.0	14.8	42.2	0.0	8.3	0.6	0.1	0.1	1.9	2.2	0.5	1.7	0.0	0.3	0.9
Lamar	3,550	86.1	0.0	17.8	9.0	0.0	4.3	1.2	0.0	0.2	1.0	1.2	0.4	0.9	0.1	0.3	1.2
Mansfield	2,286	77.2	0.0	17.1	12.9	0.0	8.4	3.5	0.0	0.0	1.6	3.0	0.2	3.5	0.1	0.3	5.3
Milton	3,741	84.8	0.0	19.4	12.3	0.0	1.9	1.8	0.0	0.1	1.1	0.8	0.3	1.2	1.2	0.2	0.6
Montoursville	3,699	56.8	0.0	18.6	26.7	0.0	9.8	2.3	0.1	0.0	4.6	1.9	1.0	3.3	0.0	1.6	4.9

NOTE: P = prior to stop, S = subsequent to stop
NOTE: Reasons for the stop may exceed 100% as more than one reason for the stop may be indicated for a traffic stop.

	Total # of Stops	% Speeding		Amt. over Limit (MPH)	% Moving Violation		% Equipment/ Inspection		% Preexisting Info		% Registration		% License		% Spec. Traf. Enf.	% Other	
		P	S		P	S	P	S	P	S	P	S	P	S	P	P	S
AREA II (cont.)																	
Selinsgrove	3,494	80.9	0.0	18.4	8.3	0.0	7.8	3.2	0.0	0.0	3.5	1.2	0.4	1.9	0.3	0.6	2.5
Stonington	2,073	72.6	0.0	18.3	12.3	0.0	12.1	3.8	0.2	0.0	6.4	4.3	1.3	7.1	0.0	0.4	7.6
Troop N																	
Bloomsburg	1,857	63.9	0.0	18.8	34.0	0.0	1.7	0.8	0.2	0.0	1.3	1.0	0.4	1.8	0.1	0.1	1.5
Fern Ridge	2,489	44.5	0.0	19.5	33.8	0.0	19.0	1.3	0.1	0.0	2.8	1.6	0.7	2.0	1.4	0.6	3.6
Hazleton	1,471	68.3	0.0	20.4	17.7	0.0	8.0	2.3	0.1	0.1	6.8	2.0	0.7	4.2	0.0	1.0	1.8
Lehighton	1,792	61.4	0.0	20.4	17.1	0.0	15.0	1.0	0.0	0.2	5.6	0.7	0.4	1.8	0.1	1.7	1.3
Swiftwater	2,993	67.2	0.0	22.7	19.3	0.0	11.2	3.6	0.0	2.9	4.1	2.2	0.8	3.8	0.1	0.3	5.7
Troop P																	
Laporte	1,571	42.1	0.0	18.5	45.0	0.0	9.7	1.7	0.1	0.1	2.3	1.8	0.4	1.6	0.2	0.3	3.0
Shickshinny	1,113	54.5	0.0	19.2	31.1	0.0	9.2	4.0	0.1	0.4	3.0	2.8	1.6	4.7	0.0	1.4	4.9
Towanda	2,088	61.4	0.0	17.5	12.4	0.0	18.9	2.5	0.3	0.5	5.6	2.8	1.0	3.6	2.8	1.5	4.1
Tunkhannock	908	44.7	0.0	20.5	29.4	0.0	13.5	1.7	0.1	0.0	5.0	2.8	2.8	2.8	0.0	1.5	4.1
Wyoming	1,832	74.8	0.0	22.7	14.8	0.0	7.8	0.9	0.2	0.0	5.3	2.4	0.9	2.5	0.5	1.1	1.1
Troop R																	
Blooming Grove	1,875	47.7	0.0	18.9	25.2	0.0	22.1	2.7	0.2	0.0	5.3	2.4	0.9	2.5	0.5	1.1	1.1
Dunmore	1,887	74.0	0.0	21.1	14.8	0.0	6.8	3.1	0.1	0.0	2.4	1.5	0.5	3.3	0.2	1.4	2.2
Gibson	2,266	53.0	0.0	19.0	30.9	0.0	13.4	0.8	0.1	0.0	1.5	1.1	0.3	1.8	0.7	2.3	1.4
Honesdale	1,342	62.4	0.0	18.2	17.7	0.0	15.6	2.5	0.2	0.1	2.8	1.9	0.7	2.1	0.1	1.2	1.9
AREA III																	
Troop A																	
Ebensburg	4,008	75.0	0.0	19.0	12.0	0.0	7.7	6.4	0.1	2.4	4.6	2.8	0.5	3.5	0.1	0.9	4.3
Greensburg	4,110	50.8	0.0	20.4	25.4	0.0	12.6	2.9	0.1	0.2	9.4	1.9	1.8	3.6	0.2	0.7	2.2
Indiana	4,363	58.7	0.0	19.8	18.1	0.0	13.2	1.2	0.3	0.0	6.9	1.1	0.9	2.0	0.9	2.2	2.9
Kiski Valley	3,308	44.6	0.0	20.6	39.4	0.0	10.4	5.4	0.2	0.9	5.4	2.7	1.0	5.1	0.3	0.8	3.9
Somerset (A)	2,266	68.4	0.0	19.3	21.8	0.0	7.0	4.1	0.1	0.1	4.3	2.6	0.8	2.7	0.0	0.7	10.3

NOTE: P = prior to stop, S = subsequent to stop

NOTE: Reasons for the stop may exceed 100% as more than one reason for the stop may be indicated for a traffic stop.

Table 3.5: Reason for Stop by Station - 2009 (p. 3 of 4)

	Total # of Stops	% Speeding		Amt. over Limit (MPH)	% Moving Violation		% Equipment/ Inspection		% Preexisting Info		% Registration		% License		% Spec. Traf. Enf.	% Other	
		P	S		P	S	P	S	P	S	P	S	P	S	P	P	S
AREA III (cont.)																	
Troop G																	
Bedford	3,829	65.9	0.0	18.2	19.3	0.0	0.0	12.7	1.5	0.0	0.2	3.6	1.9	0.2	2.4	0.2	0.3
Hollidaysburg	2,716	59.2	0.0	17.6	31.1	0.0	9.5	1.5	0.0	0.0	3.8	3.2	0.6	4.6	0.3	0.4	1.5
Huntingdon	4,039	72.6	0.0	18.1	12.9	0.0	11.0	1.2	0.1	0.0	3.8	2.0	0.2	2.8	0.6	0.3	2.2
Lewistown	5,095	88.0	0.0	19.6	5.4	0.0	4.7	2.9	0.1	0.1	2.1	4.1	0.6	4.3	0.0	0.5	8.2
McConnellsburg	5,772	79.9	0.0	21.2	10.2	0.0	9.0	0.4	0.0	0.0	1.0	0.5	0.3	0.7	0.5	0.1	0.4
Philipsburg	3,560	82.8	0.0	17.6	12.4	0.0	3.8	1.3	0.1	0.2	0.9	1.9	0.1	1.7	0.5	0.3	2.8
Rockview	5,564	79.7	0.0	19.7	16.6	0.0	2.3	1.8	0.0	0.4	1.5	1.3	0.2	1.1	0.0	0.3	1.3
Troop H																	
Carlisle	6,995	73.4	0.0	18.1	12.4	0.0	8.2	1.3	0.1	0.0	5.3	1.5	2.1	2.7	0.1	1.4	4.8
Chambersburg	3,044	74.4	0.0	18.5	12.5	0.0	9.0	3.0	0.2	1.1	4.8	2.5	0.9	3.7	0.0	0.7	1.9
Gettysburg	3,312	73.4	0.0	19.2	14.5	0.0	8.4	1.2	0.1	0.1	2.7	0.9	1.4	2.1	0.4	0.9	2.9
Harrisburg	2,231	72.9	0.0	22.3	18.4	0.0	2.6	0.7	0.0	0.0	5.1	0.8	1.0	1.8	0.2	1.6	1.3
Lykens	1,818	55.4	0.0	18.2	20.5	0.0	13.2	1.7	0.0	0.1	7.4	2.0	1.9	2.9	0.7	1.8	4.5
Newport	2,705	89.4	0.0	18.3	5.1	0.0	2.8	1.0	0.0	0.0	2.0	2.2	0.9	2.6	0.1	0.8	4.5
York	3,925	67.1	0.0	20.1	8.2	0.0	17.2	0.9	0.1	0.0	5.2	0.8	1.8	1.5	0.7	0.7	0.8
AREA IV																	
Troop C																	
Clarion	2,377	81.9	0.0	18.6	9.3	0.0	8.8	3.0	0.1	0.1	2.6	4.0	0.5	2.5	0.0	0.8	4.5
Clearfield	4,148	87.2	0.0	16.7	7.9	0.0	5.3	2.1	0.0	0.0	1.7	2.0	0.4	2.0	0.0	0.2	1.0
Dubois	3,365	72.4	0.0	18.2	22.0	0.0	4.2	2.2	0.1	0.1	1.4	1.2	0.2	2.4	1.9	1.8	1.8
Kane	2,056	56.8	0.0	16.6	21.9	0.0	16.6	0.8	0.0	0.0	4.6	1.1	0.2	1.9	0.1	0.3	1.5
Punxsutawney	2,435	73.9	0.0	16.8	10.1	0.0	12.5	1.7	0.0	0.0	3.4	2.4	1.1	2.9	0.2	2.3	5.4
Ridgway	2,588	80.8	0.0	15.5	12.7	0.0	5.3	1.3	0.1	0.2	1.6	2.6	0.5	1.9	0.2	4.1	3.6
Tionesta	1,541	83.1	0.0	15.3	8.6	0.0	7.0	4.3	0.1	0.6	1.4	4.2	0.7	2.8	0.3	0.3	4.1
Troop D																	
Beaver	3,380	37.0	0.0	20.2	24.0	0.0	22.1	3.8	0.7	0.0	10.4	2.7	0.7	5.7	0.2	1.4	3.3
Butler	3,996	74.9	0.0	19.6	10.7	0.0	9.2	2.4	0.1	0.1	7.1	1.7	2.6	3.2	18.5	0.7	2.2
Kittanning	2,581	75.0	0.0	19.7	9.0	0.0	11.9	2.2	0.2	0.1	3.6	2.0	1.4	4.1	0.1	1.2	5.5

NOTE: P = prior to stop, S = subsequent to stop

NOTE: Reasons for the stop may exceed 100% as more than one reason for the stop may be indicated for a traffic stop.

Table 3.5: Reason for Stop by Station - 2009 (p. 4 of 4)

	Total # of Stops	% Speeding		Amt. over Limit (MPH)	% Moving Violation		% Equipment/ Inspection		% Preexisting Info		% Registration		% License		% Spec. Traf. Enf.	% Other	
		P	S		P	S	P	S	P	S	P	S	P	S	P	P	S
AREA IV (cont.)																	
Mercer	3,107	85.1	0.0	17.3	6.5	0.0	6.5	0.9	0.1	0.0	1.9	1.1	0.6	1.7	0.1	0.6	1.5
New Castle	2,864	52.5	0.0	17.6	12.5	0.0	27.8	1.5	0.3	0.9	4.4	4.1	1.4	4.6	0.1	1.0	4.9
Troop E																	
Corry	1,448	76.0	0.0	15.7	10.9	0.0	7.7	3.5	0.1	0.0	3.9	3.9	0.6	5.3	0.5	1.2	9.1
Erie	4,897	74.5	0.0	18.5	16.9	0.0	5.8	2.1	0.1	0.2	4.1	3.3	0.3	3.3	0.1	0.9	5.3
Franklin	1,907	61.5	0.0	15.9	16.3	0.0	15.5	3.9	0.2	0.1	5.4	2.5	0.8	4.1	0.1	0.4	1.0
Girard	3,417	76.9	0.0	18.1	16.0	0.0	4.2	1.7	0.1	0.1	3.4	4.7	0.4	4.5	0.1	1.6	7.6
Meadville	6,399	76.5	0.0	17.4	9.3	0.0	10.8	2.1	0.1	0.1	3.4	2.2	0.3	2.4	0.0	0.6	3.8
Warren	1,153	67.1	0.0	16.7	13.1	0.0	9.4	2.8	0.8	0.4	4.9	3.0	1.2	3.5	0.3	1.7	2.3
Troop B																	
Belle Vernon	2,524	69.5	0.0	21.3	19.2	0.0	6.3	1.9	0.0	0.0	4.5	1.1	1.3	1.5	0.2	0.3	1.0
Pittsburgh	3,528	57.0	0.0	23.3	36.4	0.0	4.0	1.7	0.3	0.9	3.6	1.9	1.8	3.3	0.3	0.8	2.5
Uniontown	4,675	43.4	0.0	19.6	35.3	0.0	12.8	3.1	0.5	0.1	9.7	1.2	3.4	4.6	0.2	1.6	4.2
Washington	3,466	49.4	0.0	19.9	37.7	0.0	9.4	2.2	0.1	0.1	3.3	2.7	0.6	3.1	2.3	0.3	1.2
Waynesburg	1,340	74.6	0.0	19.5	14.0	0.0	8.8	3.0	0.4	0.0	3.7	2.3	0.4	3.4	0.0	0.5	0.7
Bureau of Patrol																	
Troop T																	
Bowmansville	9,345	74.0	0.0	18.6	19.6	0.0	5.4	0.9	0.0	0.0	1.5	0.9	0.2	1.6	0.0	0.2	0.5
Everett	14,047	96.3	0.0	17.7	3.5	0.0	1.3	2.0	0.0	0.0	0.4	2.3	0.2	2.1	0.0	0.2	0.6
Gibsonia	4,505	73.5	0.0	16.4	20.2	0.0	4.2	1.6	0.0	0.6	1.5	2.6	0.5	1.6	0.2	1.0	1.8
Highspire	14	64.3	0.0	16.9	7.1	0.0	21.4	0.0	0.0	0.0	7.1	0.0	0.0	0.0	0.0	0.0	0.0
King of Prussia	8,904	76.9	0.0	19.9	17.1	0.0	4.4	1.2	0.0	0.3	2.6	1.5	0.5	1.9	0.1	0.9	1.3
New Stanton	6,600	75.4	0.0	19.0	16.1	0.0	7.6	1.6	0.0	0.0	0.9	1.9	0.4	2.2	0.0	0.3	0.4
Newville	7,428	85.8	0.0	19.7	5.5	0.0	6.5	1.2	0.0	0.0	1.7	3.8	0.2	1.9	0.0	0.2	1.2
Pocono	5,299	72.4	0.0	19.1	20.3	0.0	5.9	1.4	0.0	0.0	1.9	2.3	0.5	3.0	0.0	0.6	2.7
Somerset (T)	4,985	75.1	0.0	18.9	23.9	0.0	1.8	0.5	0.0	0.0	0.3	0.5	0.4	1.0	0.0	0.3	0.3

NOTE: P = prior to stop, S = subsequent to stop
NOTE Reasons for the stop may exceed 100% as more than one reason for the stop may be indicated for a traffic stop.

DRIVERS' CHARACTERISTICS

Driver characteristics are reported in Tables 3.6 & 3.7 across all organizational units. The characteristics of the drivers are grouped by: 1) drivers' age and gender; 2) drivers' race/ethnicity; and 3) drivers' residency.

Drivers' Age & Gender

Table 3.6 reports the total number of traffic stops initiated by PSP personnel, the average age of the driver, and the percent of traffic stops involving male drivers at the department, area, and troop levels. Based on the 306,526 traffic stops, drivers' average age was 35.3 years old and 66.9% of all traffic stops involved a male driver. At the area level, the average age of drivers ranged from a high of 36.1 years old in Area IV to a low of 34.4 years old in Area I. The percentage of male drivers varied from a high of 67.9% in the Bureau of Patrol to a low of 65.5% in Area III. Drivers' average age varied more noticeably at the troop level (Table 3.6) and at the station level (Table 3.7).

Drivers' Race/Ethnicity

In all trooper initiated traffic stops, PSP personnel visually determined the racial/ethnic composition of the drivers based solely on their own perceptions. This method avoids asking drivers to self-identify their race/ethnicity. The collection of drivers' race/ethnicity raises reliability and validity concerns for data collection. Police may be reluctant to indicate drivers' race/ethnicity or may report that information incorrectly. Alternatively, PSP personnel may "disengage," or initiate fewer traffic stops overall.

There are strategies, however, to increase the validity and reliability of this type of data. For example, the current data collection effort contractually guarantees confidentiality to each Trooper. Although Troopers' employee numbers are initially reported on the data collection forms, the research team is required to remove this information from all data files after the Troopers' demographic information has been successfully merged with the traffic stop data. Through the procedures included in the contract and approved by the University of Cincinnati Institutional Review Board, PSP legal team, and PSP union officials, individual Troopers cannot be identified in data analyses. The purpose of this protection is to increase the reliability and validity of the data collected. All PSP Troopers were advised of this confidentiality agreement by the Principal Investigator in a training video. Other initiatives designed to increase compliance and data accuracy are fully described in the *Year 1 Final Report* (see Engel et al., 2004).

Across the department, the racial/ethnic composition of all drivers encountered during member-initiated traffic stops in 2009 is as follows:
- White = 83.6%
- Black = 8.8%
- Any Hispanic = 3.4%
  - White Hispanic = 3.1%

- o Black Hispanic = 0.3%
- Native American = 0.1%
- Middle Eastern = 2.0%
- Asian = 1.8%
- Unknown race/ethnicity or missing data 0.3%

Importantly, some variation in the racial/ethnic background of drivers stopped across areas, troops, and stations is to be expected due to differences in the demographic makeup of residents and travelers, as well as differences in traffic flow patterns in these locations. Further analyses are provided in Section 4, where the percentage of traffic stops by race/ethnicity is compared with the percentage across previous years.

At the area level, the rate of traffic stops involving White drivers ranged from a high of 90.0% in Area IV to a low of 73.1% in Area I (see Table 3.6). Traffic stops involving Black drivers reached a high of 14.9% in Area I and a low of 5.4% in Area IV. Finally, Hispanic traffic stops were also highest in Area I (7.0%) and lowest in Area IV (1.3%). Greater variation is reported at the troop and station levels in Tables 3.6 & 3.7, respectively.

Drivers' Residency

Tables 3.6 & 3.7 also report stopped drivers' residency based on reported residential zip codes. For every traffic stop, drivers' zip codes were recorded to determine the percentage of stops that occurred in locations where the drivers actually reside. Across the department, 94.9% of drivers stopped did not reside in the municipality where they were stopped, 64.6% did not reside in the county where they were stopped, and 24.2% did not reside in the state of Pennsylvania. The rates of out-of-state and out-of-county residents stopped varied noticeably across organizational units. At the area level, out-of-state traffic stops ranged from a high of 35.4% in the Bureau of Patrol to a low of 15.0% in Area I, while out-of-county traffic stops ranged from a high of 90.7% in the Bureau of Patrol to a low of 49.6% in Area I. These differences are likely partially related to the geographic locations of these organizational units and the traffic patterns that exist within those units. Table 3.6 provides a description of the troop rates, while station rates are reported in Table 3.7.

Table 3.6: 2009 Characteristics of Drivers Stopped by Department, Area & Troop

	Total # of Stops	Average Age	% Male	% White	% Black	% White Hispanic	% Black Hispanic	% Any Hispanic	% Native American	% Middle Eastern	% Asian	% Missing/ Unknown	% Stopped out of Municipality	% Stopped out of County	% Stopped out of State
PSP Dept.	306,256	35.3	66.9	83.6	8.8	3.1	0.3	3.4	0.1	2.0	1.8	0.3	94.9	64.6	24.2
AREA I	55,865	34.4	67.6	73.1	14.9	7.0	0.6	7.6	0.0	1.8	2.3	0.4	90.8	49.6	15.0
Troop J	13,680	33.6	65.6	76.3	10.7	9.4	0.4	9.8	0.0	1.1	1.6	0.5	94.3	34.6	9.9
Troop K	16,650	34.4	69.0	61.4	27.0	5.0	0.3	5.4	0.0	2.1	3.6	0.5	82.5	53.7	13.4
Troop L	10,954	35.3	66.6	84.5	6.2	5.3	1.0	6.3	0.0	1.6	1.2	0.1	95.5	54.8	19.4
Troop M	14,581	34.3	68.5	74.8	11.7	8.2	0.8	8.9	0.1	2.1	2.2	0.2	93.6	54.9	18.2
AREA II	47,286	35.8	67.2	86.3	6.2	3.1	0.4	3.4	0.0	1.9	1.6	0.6	95.0	65.5	27.5
Troop F	21,802	36.2	65.7	89.7	4.7	1.6	0.3	1.9	0.0	1.6	1.3	0.8	96.3	67.7	24.3
Troop N	10,602	34.5	66.6	76.3	11.0	6.5	0.8	7.3	0.0	2.6	2.2	0.6	92.9	67.7	32.2
Troop P	7,512	36.4	69.3	94.6	2.3	1.7	0.1	1.8	0.0	0.6	0.5	0.2	95.1	52.9	15.3
Troop R	7,370	35.7	70.3	82.4	7.4	3.9	0.3	4.3	0.0	2.8	2.7	0.4	94.2	68.6	42.6
AREA III	72,660	35.3	65.5	89.4	5.8	1.8	0.2	1.9	0.1	1.4	1.2	0.2	94.9	61.3	21.0
Troop A	18,055	35.3	66.4	94.7	3.3	0.5	0.0	0.5	0.0	0.7	0.5	0.2	93.4	48.9	7.2
Troop G	30,575	35.7	65.8	88.5	5.9	1.5	0.1	1.6	0.1	2.0	1.7	0.1	96.6	72.5	26.7
Troop H	24,030	34.8	64.4	86.7	7.5	3.1	0.3	3.4	0.1	1.0	1.1	0.2	93.9	56.4	24.0
AREA IV	69,192	36.1	66.6	90.0	5.4	1.3	0.1	1.4	0.1	1.8	1.0	0.2	94.0	56.5	22.9
Troop C	18,510	37.3	68.8	87.3	5.6	2.1	0.4	2.5	0.1	3.0	1.5	0.2	94.6	72.0	33.9
Troop D	15,928	34.9	65.4	90.6	6.0	0.9	0.1	0.9	0.1	1.4	0.8	0.2	95.0	56.4	15.5
Troop E	19,221	36.7	65.3	91.2	4.0	1.4	0.1	1.5	0.2	1.7	1.1	0.3	93.0	47.4	21.0
Troop B	15,533	35.2	66.7	91.2	6.2	0.5	0.0	0.6	0.0	1.1	0.7	0.2	93.7	49.6	19.7
Bureau of Patrol	61,127	34.9	67.9	77.2	12.4	3.2	0.4	3.6	0.1	3.4	3.1	0.3	99.6	90.7	35.4
Troop T	61,127	34.9	67.9	77.2	12.4	3.2	0.4	3.6	0.1	3.4	3.1	0.3	99.6	90.7	35.4

NOTE: Any Hispanic totals may appear to differ slightly from the combination of White Hispanic & Black Hispanic due to rounding.

Table 3.7: 2009 Characteristics of Drivers Stopped by Station (p. 1 of 4)

	Total # of Stops	Ave. Age	% Male	% White	% Black	% White Hispanic	% Black Hispanic	% Any Hispanic	% Native American	% Middle Eastern	% Asian	% Missing/ Unknown	% Stopped out of Municipality	% Stopped out of County	% Stopped out of State
AREA I															
Troop J															
Avondale	3,236	34.6	64.9	70.9	9.6	16.2	0.5	16.7	0.0	0.6	1.2	0.0	95.7	34.2	17.0
Embreeville	4,221	33.3	63.7	73.1	16.3	5.4	0.4	5.8	0.0	2.0	2.7	0.0	94.9	41.0	9.2
Ephrata	1,649	31.6	67.7	82.7	5.9	7.5	0.2	7.6	0.0	0.8	1.2	0.0	96.8	38.4	7.5
Lancaster	4,574	33.9	67.2	80.7	8.2	8.9	0.4	9.3	0.0	0.7	1.0	0.0	92.0	27.6	6.3
Troop K															
Media	4,346	35.0	67.8	70.0	22.4	3.2	0.1	3.3	0.0	1.8	2.4	0.0	93.4	48.2	15.8
Philadelphia	9,825	34.1	70.5	53.8	33.0	5.9	0.4	6.4	0.0	2.4	4.3	0.0	74.8	61.1	14.7
Skippack	2,479	34.3	65.3	79.7	11.3	4.6	0.4	5.1	0.0	1.8	2.6	0.0	93.4	34.0	4.8
Troop L															
Frackville	2,263	35.0	67.8	85.7	6.8	3.7	1.1	4.8	0.0	1.2	1.2	0.0	96.9	67.2	29.4
Hamburg	1,456	36.0	66.2	79.5	7.9	6.0	1.2	7.3	0.1	3.2	1.8	0.0	97.5	69.2	29.9
Jonestown	3,465	35.4	66.5	81.7	6.7	7.1	0.6	7.7	0.0	2.2	1.6	0.0	94.7	64.2	23.5
Reading	1,973	34.5	66.4	84.9	4.8	6.8	1.9	8.8	0.0	0.7	0.8	0.0	93.5	32.6	6.0
Schuylkill Haven	1,797	35.9	65.8	92.1	4.5	1.7	0.4	2.1	0.0	0.6	0.6	0.0	96.3	33.9	5.1
Troop M															
Belfast	2,673	33.0	68.2	74.3	11.2	10.2	1.0	11.2	0.1	1.6	1.6	0.0	96.9	62.4	21.1
Bethlehem	1,387	33.8	67.8	74.5	9.9	11.5	0.5	12.0	0.1	2.2	1.3	0.0	86.5	43.2	7.1
Dublin	2,865	35.2	68.1	88.7	3.7	4.4	0.3	4.7	0.1	0.9	1.7	0.0	90.9	50.0	5.8
Fogelsville	3,555	35.0	68.4	73.2	9.4	10.8	1.4	12.2	0.1	2.4	2.4	0.0	96.8	59.5	23.5
Trevose	4,101	34.1	69.4	67.0	20.1	6.1	0.5	6.5	0.0	2.9	3.0	0.0	92.8	53.3	24.2
AREA II															
Troop F															
Coudersport	1,882	39.2	70.8	97.4	0.6	0.8	0.1	0.9	0.1	0.7	0.4	0.0	90.6	64.1	17.3
Emporium	1,077	37.9	75.3	99.3	0.3	0.3	0.0	0.3	0.0	0.2	0.0	0.0	95.5	73.6	9.9
Lamar	3,550	35.8	67.3	82.1	7.3	3.5	0.6	4.2	0.0	3.4	2.2	0.0	98.6	82.6	40.6
Mansfield	2,286	35.9	65.9	86.1	3.8	1.0	0.2	1.3	0.0	1.3	1.7	0.1	96.8	57.3	33.9
Milton	3,741	34.8	63.0	83.2	8.4	2.4	0.6	3.0	0.0	2.9	2.2	0.0	98.7	90.3	38.4
Montoursville	3,699	35.7	63.0	92.6	4.7	0.8	0.2	1.0	0.0	0.7	0.8	0.0	94.9	47.7	12.0

NOTE: Any Hispanic totals may appear to differ slightly from the combination of White Hispanic & Black Hispanic due to rounding.

Table 3.7: 2009 Characteristics of Drivers Stopped by Station (p. 2 of 4)

	Total # of Stops	Ave. Age	% Male	% White	% Black	% White Hispanic	% Black Hispanic	% Any Hispanic	% Native American	% Middle Eastern	% Asian	% Missing/ Unknown	% Stopped out of municipality	% Stopped out of County	% Stopped out of State
AREA II (cont.)															
Selinsgrove	3,494	36.3	64.2	91.8	4.9	1.3	0.1	1.3	0.0	1.3	1.2	0.0	96.9	74.4	20.7
Stonington	2,073	36.6	65.8	97.4	1.4	0.5	0.0	0.6	0.0	0.3	0.2	0.0	94.6	37.7	2.4
Troop N															
Bloomsburg	1,857	33.3	63.0	78.2	9.4	4.6	0.5	5.2	0.1	3.9	2.9	0.0	99.0	88.9	40.9
Fern Ridge	2,489	35.3	69.1	76.6	11.6	5.1	0.9	6.0	0.0	2.6	3.1	0.0	84.8	68.2	36.4
Hazleton	1,471	33.7	69.3	70.4	8.7	12.2	1.8	14.0	0.0	2.3	1.8	0.0	98.0	70.1	35.3
Lehighton	1,792	35.1	64.7	89.3	5.0	3.8	0.4	4.2	0.0	0.7	0.7	0.0	89.8	47.8	6.9
Swiftwater	2,933	34.5	66.8	70.1	16.1	7.5	0.8	8.3	0.0	3.1	2.1	0.0	95.3	64.8	36.8
Troop P															
Laporte	1,571	40.1	74.3	97.2	1.3	0.6	0.0	0.6	0.0	0.3	0.5	0.0	97.1	81.0	17.1
Shickshinny	1,113	34.5	65.3	94.2	2.4	2.0	0.1	2.1	0.0	0.8	0.5	0.0	92.4	35.8	5.8
Towanda	2,088	36.6	68.1	96.8	1.1	1.0	0.0	1.0	0.0	0.6	0.4	0.0	92.3	35.1	14.7
Tunkhannock	908	34.2	70.3	97.2	1.0	1.1	0.1	1.2	0.0	0.3	0.2	0.0	95.7	68.1	9.6
Wyoming	1,832	35.6	68.2	88.9	5.0	3.5	0.2	3.8	0.1	1.0	0.7	0.0	97.8	52.1	22.9
Troop R															
Blooming Grove	1,875	37.1	67.7	85.4	6.7	5.0	0.4	5.3	0.1	1.2	1.1	0.0	92.2	71.5	41.4
Dunmore	1,887	34.0	70.7	80.2	8.7	4.4	0.3	4.7	0.0	3.8	2.3	0.0	95.4	65.8	36.0
Gibson	2,266	35.7	74.2	75.4	9.6	3.5	0.4	4.0	0.0	4.7	5.6	0.0	96.8	79.0	61.3
Honesdale	1,342	36.2	67.0	93.1	3.1	2.5	0.1	2.6	0.0	0.6	0.4	0.0	90.9	50.7	22.0
AREA III															
Troop A															
Ebensburg	4,008	35.6	66.2	95.7	2.4	0.5	0.1	0.6	0.0	0.6	0.6	0.0	91.9	56.8	7.6
Greensburg	4,110	35.4	61.7	95.7	3.1	0.4	0.0	0.4	0.0	0.5	0.3	0.0	93.0	25.4	2.7
Indiana	4,363	33.6	69.5	93.6	4.2	0.6	0.0	0.6	0.0	0.9	0.6	0.0	92.8	57.1	9.7
Kiski Valley	3,308	35.5	69.9	92.4	5.0	0.5	0.1	0.5	0.0	1.1	0.6	0.0	97.6	65.7	7.8
Somerset (A)	2,266	37.6	64.2	96.7	1.3	0.3	0.0	0.4	0.0	0.2	0.4	0.0	92.1	37.3	9.1

NOTE: Any Hispanic totals may appear to differ slightly from the combination of White Hispanic & Black Hispanic due to rounding.

Table 3.7: 2009 Characteristics of Drivers Stopped by Station (p. 3 of 4)

	Total # of Stops	Ave. Age	% Male	% White	% Black	% White Hispanic	% Black Hispanic	% Any Hispanic	% Native American	% Middle Eastern	% Asian	% Missing/ Unknown	% stopped out of municipality	% stopped out of county	% stopped out of state
AREA III (cont.)															
Troop G															
Bedford	3,829	36.6	65.5	88.8	6.1	1.7	0.2	1.9	0.0	2.2	1.0	0.0	96.1	65.5	30.6
Hollidaysburg	2,716	32.7	62.2	90.6	5.2	0.8	0.0	0.8	0.0	1.6	1.5	0.0	95.6	63.6	19.8
Huntingdon	4,039	37.4	65.1	97.4	1.4	0.3	0.0	0.3	0.0	0.3	0.4	0.0	96.0	57.4	5.5
Lewistown	5,095	33.8	66.2	89.6	5.3	1.9	0.2	2.1	0.1	1.3	1.6	0.0	96.8	72.7	12.6
McConnellsburg	5,772	38.2	67.3	79.2	11.9	1.8	0.1	1.9	0.4	3.7	2.7	0.0	95.0	84.5	53.7
Philipsburg	3,560	35.0	66.6	92.4	2.8	1.0	0.1	1.1	0.0	2.0	1.5	0.0	97.2	73.4	19.5
Rockview	5,564	34.6	65.8	86.7	5.9	2.3	0.2	2.4	0.0	2.1	2.6	0.0	98.7	79.3	32.5
Troop H															
Carlisle	6,995	34.9	65.4	88.6	7.0	2.2	0.3	2.5	0.0	0.8	1.0	0.0	94.8	69.6	31.8
Chambersburg	3,044	34.9	61.9	89.6	5.7	3.4	0.2	3.5	0.1	0.5	0.4	0.0	90.0	33.3	23.0
Gettysburg	3,312	35.0	62.1	84.3	5.4	6.4	0.2	6.6	0.1	1.7	1.8	0.0	97.0	53.8	23.3
Harrisburg	2,231	34.1	69.1	79.4	11.4	4.6	0.5	5.1	0.0	1.9	1.7	0.0	96.1	69.0	26.4
Lykens	1,818	36.1	62.7	97.0	1.4	1.0	0.1	1.1	0.0	0.2	0.2	0.0	86.2	27.6	3.2
Newport	2,705	33.6	63.3	89.6	5.7	1.8	0.2	2.0	0.1	1.0	1.6	0.0	98.6	80.4	15.2
York	3,925	34.9	65.4	80.3	13.5	2.9	0.4	3.3	0.1	1.1	1.3	0.0	91.8	42.8	25.8
AREA IV															
Troop C															
Clarion	2,377	35.5	69.4	78.8	10.0	4.0	0.5	4.5	0.0	4.2	2.5	0.0	97.5	83.0	50.3
Clearfield	4,148	36.1	66.9	78.4	8.9	3.2	0.9	4.0	0.1	6.2	2.2	0.0	98.0	81.4	53.5
Dubois	3,365	36.2	69.9	82.7	8.8	3.1	0.3	3.4	0.1	2.9	1.8	0.0	98.1	83.7	46.4
Kane	2,056	39.3	70.4	92.8	2.0	1.0	0.1	1.2	0.1	2.0	1.7	0.0	86.7	54.9	25.4
Punxsutawney	2,435	37.7	69.2	96.8	1.6	0.5	0.1	0.5	0.0	0.8	0.2	0.0	94.3	60.3	7.6
Ridgway	2,588	38.1	66.7	95.7	1.2	0.7	0.2	0.9	0.1	1.2	0.7	0.0	88.9	51.3	16.4
Tionesta	1,541	40.7	70.9	97.9	1.2	0.4	0.0	0.4	0.1	0.3	0.2	0.0	93.8	79.8	11.2
Troop D															
Beaver	3,380	34.2	64.1	91.7	6.4	0.6	0.0	0.6	0.0	1.0	0.3	0.0	95.9	46.2	14.2
Butler	3,996	34.5	64.3	93.7	4.0	0.6	0.0	0.7	0.0	0.9	0.7	0.0	92.5	53.3	9.1
Kittanning	2,581	34.7	64.0	93.1	4.8	0.5	0.1	0.6	0.1	0.8	0.6	0.0	96.1	53.4	5.0
Mercer	3,107	33.8	66.1	82.3	8.9	2.3	0.1	2.4	0.0	3.8	2.1	0.0	97.2	80.7	37.2

NOTE: Any Hispanic totals may appear to differ slightly from the combination of White Hispanic & Black Hispanic due to rounding.

Table 3.7: 2009 Characteristics of Drivers Stopped by Station (p. 4 of 4)

	Total # of Stops	Ave. Age	% Male	% White	% Black	% White Hispanic	% Black Hispanic	% Any Hispanic	% Native American	% Middle Eastern	% Asian	% Missing/ Unknown	% stopped out of municipality	% stopped out of county	% stopped out of state
AREA IV (cont.)															
New Castle	2,864	37.5	69.2	92.1	6.2	0.5	0.0	0.6	0.3	0.6	0.3	0.0	94.1	49.1	12.1
Troop E															
Corry	1,448	36.7	70.2	97.4	1.1	0.5	0.0	0.5	0.0	0.6	0.4	0.0	95.4	39.4	8.1
Erie	4,897	36.6	66.1	88.4	5.3	1.7	0.0	1.7	0.1	2.3	1.8	0.0	92.3	48.4	36.3
Franklin	1,907	36.9	69.4	87.5	2.8	2.9	0.3	3.2	1.5	2.6	1.9	0.0	90.6	53.9	16.6
Girard	3,417	35.6	62.0	90.2	4.7	2.0	0.0	2.0	0.0	1.8	0.9	0.0	87.1	33.7	18.1
Meadville	6,399	37.6	63.7	92.3	4.2	0.8	0.0	0.9	0.1	1.4	0.8	0.0	96.6	55.5	17.1
Warren	1,153	35.7	67.2	98.4	0.6	0.5	0.1	0.6	0.1	0.1	0.1	0.0	94.6	38.0	9.0
Troop B															
Belle Vernon	2,524	36.1	70.5	90.8	6.1	0.9	0.0	0.9	0.1	1.3	0.7	0.0	94.8	67.9	23.8
Pittsburgh	3,528	34.8	65.8	88.2	8.2	0.7	0.1	0.8	0.0	1.3	1.2	0.0	96.4	51.4	19.0
Uniontown	4,675	34.7	63.4	93.9	5.3	0.2	0.0	0.2	0.0	0.3	0.1	0.0	89.6	23.4	5.7
Washington	3,466	35.9	68.6	90.1	6.4	0.6	0.1	0.7	0.0	1.6	1.1	0.0	94.7	63.8	30.5
Waynesburg	1,340	34.5	68.7	93.4	3.8	0.2	0.1	0.3	0.0	1.2	0.7	0.0	95.8	65.5	34.9
Bureau of Patrol															
Troop T															
Bowmansville	9,345	33.7	66.5	75.2	13.4	4.6	0.7	5.3	0.1	2.5	3.3	0.0	99.8	93.1	25.7
Everett	14,047	34.6	65.2	73.2	14.6	3.2	0.3	3.5	0.1	4.4	4.0	0.0	99.9	99.5	47.9
Gibsonia	4,505	36.2	67.9	83.6	9.6	1.4	0.1	1.5	0.0	3.2	1.8	0.0	99.2	84.2	44.4
Highspire	14	37.6	50.0	85.7	14.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	92.9	50.0	7.1
King of Prussia	8,904	34.6	70.6	74.9	12.4	4.9	0.6	5.6	0.0	3.2	3.7	0.0	99.3	79.8	23.8
New Stanton	6,600	34.6	67.8	85.7	9.2	1.0	0.1	1.1	0.0	2.2	1.7	0.0	98.5	73.6	23.8
Newville	7,428	36.6	70.3	79.8	11.2	2.7	0.3	2.9	0.1	3.0	2.8	0.0	99.9	96.2	34.7
Pocono	5,299	33.5	67.2	82.1	8.9	3.5	0.4	3.8	0.1	2.5	1.9	0.0	99.6	93.5	23.9
Somerset (T)	4,985	36.4	70.4	69.5	16.9	3.0	0.3	3.4	0.0	6.0	3.8	0.0	100.0	98.5	59.3

NOTE: Any Hispanic totals may appear to differ slightly from the combination of White Hispanic & Black Hispanic due to rounding.

TRAFFIC STOP OUTCOMES

Traffic stop outcomes, including the rate of warnings, citations, arrests, searches, and seizures of contraband, are provided at all organizational levels in Tables 3.8 & 3.9. These tables report: 1) the total number of stops; 2) the percentage of warnings, citations, and arrests issued to drivers and passengers; 3) the total number of searches conducted; 4) the percentage of occupants and/or vehicles searched; and 5) the percentage of searches resulting in contraband seizures (i.e., the "hit rate"). These percentages may exceed one-hundred percent, as drivers and passengers may experience one or more outcomes (i.e., a driver may be both warned and cited in the same stop). Additional analyses are presented in Table 3.10, in which traffic stop outcomes are examined for drivers only. Post-stop outcomes are discussed in greater detail in Sections 5 & 7 of this report.

Warnings

Based on the 306,256 traffic stops initiated in 2009, warnings were issued to drivers in 28.3% of those traffic stops. Passengers were warned in 0.2% of all department-wide traffic stops. At the area level, drivers received a warning most frequently in Area I (37.4% of all stops) and least frequently in the Bureau of Patrol (13.8%). Troop level rates of warnings are reported in Table 3.8 and at the station level in Table 3.9.

Citations

The most common traffic stop outcome for drivers in 2009 was a citation, which occurred in 86.6% of all traffic stops. Furthermore, 0.2% of all traffic stops involved one or more passengers receiving a citation. The rate of citations for drivers differed across areas. The highest rate of citations was reported in Bureau of Patrol (93.1%) while the lowest rate of citations occurred in Area IV (83.1%). The percentages of citations at the troop and station levels are also reported in Tables 3.8 & 3.9.

Arrests

Compared to warnings and citations, member-initiated traffic stops that result in arrests of drivers or passengers are relatively rare events. In 2009, 1.4% of stops resulted in the arrest of the driver, while 0.1% of all traffic stops resulted in the arrest of a passenger. At the area level, the rate of arrest ranged from a high of 2.7% in Area I to a low of 0.2% in the Bureau of Patrol. Troop level and station level rates of arrests demonstrate greater variation and are reported in Tables 3.8 & 3.9, respectively.

Searches

Similar to arrests, searches of vehicles or occupants are rare events and only occurred in 1.1% of all member-initiated traffic stops in 2009. Throughout the department, PSP

personnel reported 3,414 searches of vehicles or occupants.[3] At the area level, the rate of searches was highest in Area I, where nearly half of all department-wide searches were conducted. This organizational unit reported a search during 2.9% of all traffic stops. The fewest searches were conducted by the Bureau of Patrol (n=179 searches), with a rate of 0.3% searches occurring during traffic stops. Tables 3.8 & 3.9 also report the raw number of searches and the rate of searches at the troop and station levels, respectively.

Seizures

The rate of contraband discovery during traffic stops is referred to as a "hit rate" or a "search success rate." To calculate this rate, the number of traffic stops in which contraband was seized is divided by the number of traffic stops in which a search was conducted. This rate allows a comparison across organizational units regardless of the number of searches conducted. The search success rates reported in the tables below include searches for any reason. Additional analyses in Section 7 further examine search success rates by reason for the search.

In 2009, the overall search success rate across the department was 28.0%. In other words, contraband was discovered in slightly less than 30% of all traffic stops in which a search was reported. At the area level, the highest hit rate was reported in Area IV at 39.4%, while Area I had the lowest hit rate at 21.2%. Interestingly, Area I conducted the most searches, but had the lowest hit rate. Table 3.8 also reports the hit rates at the troop level and Table 3.9 summarizes the hit rate for stations. It is important to note that at some of these organizational units, only a limited number of searches were conducted, thus an asterisk is placed beside the hit rates based on less than ten searches. These hit rates may be unstable due to the infrequent occurrence of a vehicle or occupant search.

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[3] A search is defined by one of three conditions present on the CDR: a) 'search initiated' is indicated, b) 'reason for the search' is indicated, or c) 'seizure of contraband' is indicated.

Table 3.8: 2009 Driver Outcomes by Department, Area & Troop

	Total # of Stops	Warnings		Citations		Arrests		# of Searches	% Person or Vehicle Searched	% Seized
		% Drivers	% Passengers	% Drivers	% Passengers	% Drivers	% Passengers			
PSP Dept.	306,256	28.3	0.2	86.6	0.2	1.4	0.1	3,414	1.1	28.0
AREA I	55,865	37.4	0.2	87.2	0.3	2.7	0.2	1,605	2.9	21.2
Troop J	13,680	31.6	0.2	93.7	0.3	4.1	0.3	296	2.2	31.4
Troop K	7,375	44.3	0.5	85.1	0.3	2.6	0.4	958	5.8	20.0
Troop L	10,954	32.4	0.1	88.3	0.3	1.7	0.0	81	0.7	9.9
Troop M	14,581	38.8	0.2	82.8	0.2	2.3	0.1	270	1.9	17.4
AREA II	47,286	24.7	0.2	87.2	0.2	1.2	0.1	451	1.0	30.6
Troop F	21,802	23.0	0.3	86.5	0.3	1.1	0.1	155	0.7	38.7
Troop N	10,602	22.5	0.1	90.6	0.1	1.2	0.1	103	1.0	30.1
Troop P	7,512	27.4	0.2	83.8	0.3	1.4	0.0	54	0.7	11.1
Troop R	7,370	30.2	0.2	87.5	0.1	1.4	0.3	139	1.9	29.5
AREA III	72,660	30.7	0.2	83.8	0.2	1.4	0.1	641	0.9	30.0
Troop A	18,055	32.3	0.2	85.2	0.3	1.6	0.1	174	1.0	20.7
Troop G	30,575	35.4	0.1	79.2	0.1	0.7	0.1	184	0.6	41.3
Troop H	24,030	23.7	0.2	88.5	0.2	2.3	0.1	283	1.2	28.3
AREA IV	69,192	33.6	0.2	83.1	0.3	1.7	0.1	533	0.8	39.4
Troop C	18,510	35.4	0.1	78.3	0.2	1.1	0.0	64	0.3	32.8
Troop D	15,928	34.2	0.2	85.8	0.3	1.9	0.2	221	1.4	46.6
Troop E	19,221	39.7	0.3	76.4	0.3	1.9	0.1	108	0.6	41.7
Troop B	15,533	23.5	0.3	94.3	0.3	1.8	0.1	140	0.9	29.3
Bureau of Patrol	61,127	13.8	0.1	93.1	0.2	0.2	0.0	179	0.3	41.9
Troop T	61,127	13.8	0.1	93.1	0.2	0.2	0.0	179	0.3	41.9

Table 3.9: 2009 Driver Outcomes by Station (p. 1 of 4)

	Total # of Stops	Warnings		Citations		Arrests		# of Searches	% Person or Vehicle Searched	% Seized
		% Drivers	% Passengers	% Drivers	% Passengers	% Drivers	% Passengers			
AREA I										
Troop J										
Avondale	3,236	43.6	0.1	90.8	0.4	4.4	0.3	126	3.9	33.3
Embreeville	4,221	24.8	0.2	94.2	0.2	2.9	0.2	81	1.9	14.8
Ephrata	1,649	28.2	0.1	95.5	0.4	3.5	0.4	24	1.5	41.7
Lancaster	4,574	30.5	0.2	94.8	0.2	5.3	0.3	65	1.4	44.6
Troop K										
Media	4,346	49.0	0.6	72.9	0.2	3.8	0.8	352	8.1	24.1
Philadelphia	9,825	43.1	0.5	90.6	0.3	1.8	0.2	487	5.0	15.0
Skippack	2,479	40.7	0.1	84.4	0.3	4.0	0.3	119	4.8	28.6
Troop L										
Frackville	2,263	29.3	0.1	91.3	0.2	1.5	0.1	15	0.7	13.3
Hamburg	1,456	31.2	0.3	94.0	1.0	0.4	0.1	1	0.1	100.0*
Jonestown	3,465	30.2	0.1	81.9	0.2	2.9	0.0	38	1.1	10.5
Reading	1,973	37.2	0.1	91.1	0.1	1.5	0.1	22	1.1	4.5
Schuylkill Haven	1,797	36.4	0.0	89.0	0.1	1.1	0.0	5	0.3	20.0*
Troop M										
Belfast	2,673	25.0	0.1	84.0	0.1	0.9	0.0	27	1.0	0.0
Bethlehem	1,387	33.2	0.3	88.0	0.1	2.7	0.1	35	2.5	8.6
Dublin	2,865	53.9	0.2	76.9	0.3	3.4	0.3	64	2.2	35.9
Fogelsville	3,555	44.2	0.1	78.6	0.2	1.2	0.1	82	2.3	18.3
Trevose	4,101	34.7	0.1	87.9	0.2	3.2	0.1	62	1.5	9.7
AREA II										
Troop F										
Coudersport	1,882	40.5	1.3	68.1	0.2	1.4	0.0	11	0.6	9.1
Emporium	1,077	38.3	1.1	73.7	0.1	0.4	0.0	0	--	--
Lamar	3,550	17.7	0.4	85.2	1.0	1.8	0.1	15	0.4	26.7
Mansfield	2,286	31.8	0.0	78.4	0.3	1.3	0.1	13	0.6	69.2
Milton	3,741	14.1	0.1	96.4	0.0	0.3	0.0	10	0.3	20.0
Montoursville	3,699	18.3	0.1	91.3	0.3	1.3	0.4	55	1.5	67.3

* Indicates fewer than 10 searches conducted. Interpret percentages with caution.

Table 3.9: 2009 Driver Outcomes by Station (p. 2 of 4)

	Total # of Stops	Warnings		Citations		Arrests		# of Searches	% Person or Vehicle Searched	% Seized
		% Drivers	% Passengers	% Drivers	% Passengers	% Drivers	% Passengers			
AREA II (cont.)										
Selinsgrove	3,494	16.1	0.1	92.2	0.1	0.4	0.0	13	0.4	15.4
Stonington	2,073	35.2	0.0	84.9	0.0	1.8	0.1	38	1.8	13.2
Troop N										
Bloomsburg	1,857	17.3	0.1	90.5	0.1	0.2	0.1	4	0.2	50.0*
Fern Ridge	2,489	16.2	0.1	93.9	0.1	0.4	0.1	7	0.3	14.3*
Hazleton	1,471	27.7	0.3	88.9	0.3	1.2	0.2	28	1.9	21.4
Lehighton	1,792	21.5	0.3	89.3	0.2	1.6	0.1	22	1.2	27.3
Swiftwater	2,993	29.0	0.0	89.5	0.1	2.4	0.2	42	1.4	38.1
Troop P										
Laporte	1,571	26.4	0.1	78.5	0.1	0.6	0.1	18	1.1	27.8
Shickshinny	1,113	32.8	0.2	84.8	0.3	0.9	0.0	0	--	--
Towanda	2,088	45.0	0.3	72.3	0.8	0.9	0.0	34	1.6	2.9
Tunkhannock	908	22.2	0.2	91.6	0.6	6.7	0.1	0	--	--
Wyoming	1,832	7.6	0.1	97.1	0.0	0.4	0.0	2	0.1	0.0
Troop R										
Blooming Grove	1,875	36.6	0.3	90.5	0.1	1.7	0.2	42	2.2	19.0
Dunmore	1,887	34.3	0.3	80.5	0.1	0.9	0.3	33	1.7	33.3
Gibson	2,266	24.6	0.1	88.2	0.2	1.3	0.3	37	1.6	27.0
Honesdale	1,342	25.0	0.4	91.9	0.3	1.7	0.6	27	2.0	44.4
AREA III										
Troop A										
Ebensburg	4,008	25.3	0.1	84.5	0.1	2.1	0.1	14	0.3	28.6
Greensburg	4,110	45.2	0.3	79.4	0.3	1.4	0.0	43	1.0	25.6
Indiana	4,363	30.1	0.1	83.4	0.3	0.8	0.1	24	0.6	12.5
Kiski Valley	3,308	21.2	0.2	91.0	0.2	2.0	0.0	79	2.4	15.2
Somerset (A)	2,266	41.5	0.3	92.0	0.6	1.9	0.1	14	0.6	42.9

* Indicates fewer than 10 searches conducted. Interpret percentages with caution.

	Total # of Stops	Warnings		Citations		Arrests		# of Searches	% Person or Vehicle Searched	% Seized
		% Drivers	% Passengers	% Drivers	% Passengers	% Drivers	% Passengers			
AREA III (cont.)										
Troop G										
Bedford	3,829	48.4	0.1	67.6	0.1	1.0	0.1	51	1.3	19.6
Hollidaysburg	2,716	46.7	0.1	79.4	0.1	0.5	0.1	15	0.6	33.3
Huntingdon	4,039	44.4	0.1	68.1	0.0	1.2	0.0	22	0.5	36.4
Lewistown	5,095	23.4	0.0	91.4	0.1	0.6	0.0	33	0.6	51.5
McConnellsburg	5,772	51.1	0.2	69.3	0.1	0.6	0.1	36	0.6	55.6
Philipsburg	3,560	34.6	0.1	80.0	0.1	0.7	0.1	1	0.0	0.0*
Rockview	5,564	9.4	0.1	93.9	0.1	0.4	0.1	26	0.5	57.7
Troop H										
Carlisle	6,995	17.4	0.2	90.7	0.2	3.4	0.3	101	1.4	45.5
Chambersburg	3,044	37.7	0.6	89.8	0.3	0.7	0.2	35	1.1	5.7
Gettysburg	3,312	31.3	0.5	79.9	0.3	2.0	0.1	35	1.1	22.9
Harrisburg	2,231	22.8	0.2	92.1	0.1	1.5	0.0	25	1.1	12.0
Lykens	1,818	35.6	0.1	71.1	0.1	1.8	0.1	27	1.5	40.7
Newport	2,705	19.6	0.1	93.6	0.3	3.9	0.1	14	0.5	7.1
York	3,925	15.4	0.1	93.2	0.1	1.2	0.1	46	1.2	19.6
AREA IV										
Troop C										
Clarion	2,377	41.2	0.1	73.9	0.2	0.2	0.0	16	0.7	25.0
Clearfield	4,148	21.3	0.1	95.4	0.2	0.3	0.1	12	0.3	50.0
Dubois	3,365	23.7	0.0	85.3	0.1	0.7	0.0	6	0.2	16.7*
Kane	2,056	40.3	0.2	75.3	0.0	4.0	0.0	6	0.3	33.3*
Punxsutawney	2,435	50.5	0.1	35.3	0.2	1.8	0.1	15	0.6	40.0
Ridgway	2,588	33.5	0.0	73.6	0.6	1.0	0.1	7	0.3	14.3*
Tionesta	1,541	62.7	0.1	57.2	0.1	0.5	0.0	2	0.1	50.0*
Troop D										
Beaver	3,380	25.3	0.1	92.6	0.3	1.3	0.1	20	0.6	40.0
Butler	3,996	53.2	0.2	82.6	0.3	3.5	0.2	39	1.0	33.3
Kittanning	2,581	29.9	0.2	81.0	0.3	2.4	0.5	82	3.2	64.6
Mercer	3,107	36.9	0.1	81.3	0.1	0.5	0.1	49	1.6	24.5

* Indicates fewer than 10 searches conducted. Interpret percentages with caution.

	Total # of Stops	Warnings		Citations		Arrests		# of Searches	% Person or Vehicle Searched	% Seized
		% Drivers	% Passengers	% Drivers	% Passengers	% Drivers	% Passengers			
AREA IV (cont.)										
New Castle	2,864	19.0	0.2	91.3	0.4	1.4	0.2	31	1.1	54.8
Troop E										
Corry	1,448	47.2	0.3	66.6	0.1	3.1	0.0	8	0.6	37.5*
Erie	4,897	40.5	0.3	78.6	0.3	2.5	0.2	41	0.9	38.1
Franklin	1,907	65.2	0.8	60.8	0.3	1.6	0.1	10	0.5	10.0
Girard	3,417	37.3	0.3	83.2	0.3	2.0	0.1	12	0.4	41.7
Meadville	6,399	30.7	0.2	79.1	0.4	1.1	0.0	27	0.4	66.7
Warren	1,153	41.4	0.2	70.8	0.4	2.9	0.0	9	0.8	22.2*
Troop B										
Belle Vernon	2,524	19.1	0.4	98.1	0.2	0.5	0.1	9	0.4	11.1*
Pittsburgh	3,528	20.4	0.5	97.7	0.1	0.5	0.0	21	0.6	23.8
Uniontown	4,675	25.9	0.3	88.8	0.5	4.3	0.2	72	1.5	33.3
Washington	3,466	15.8	0.2	96.5	0.3	0.4	0.1	26	0.8	23.1
Waynesburg	1,340	51.8	0.4	91.3	0.7	1.9	0.1	12	0.9	41.7
Bureau of Patrol										
Troop T										
Bowmansville	9,345	11.2	0.1	94.1	0.3	0.3	0.1	48	0.5	43.8
Everett	14,047	9.1	0.1	95.4	0.1	0.1	0.0	22	0.2	40.9
Gibsonia	4,505	12.1	0.1	94.2	0.7	0.2	0.0	6	0.1	0.0*
Highspire	14	57.1	0.0	50.0	0.0	0.0	0.0	1	7.1	0.0*
King of Prussia	8,904	23.6	0.1	85.4	0.3	0.5	0.0	44	0.5	47.7
New Stanton	6,600	12.2	0.1	93.6	0.1	0.2	0.0	18	0.3	77.8
Newville	7,428	16.5	0.0	97.7	0.1	0.1	0.0	18	0.2	16.7
Pocono	5,299	15.7	0.0	91.7	0.1	0.1	0.0	14	0.3	21.4
Somerset (T)	4,985	11.4	0.0	91.1	0.1	0.1	0.1	8	0.2	37.5*

* Indicates fewer than 10 searches conducted. Interpret percentages with caution.

Post-Stop Outcomes by Severity

All previous analyses on post-stop outcomes reported each disposition independently. The total percentages across outcomes may exceed 100% because drivers could receive multiple outcomes. An alternative way to examine these data is to use a severity index, where only the most severe outcome for each traffic stop is reported. A severity index was created using warnings, citations, and arrests.[4] The rank ordering is as follows (from least severe to most severe):

- Level 1: Warning
- Level 2: Citation
- Level 3: Arrest

For example, if a driver received both a warning and a citation, they would be included only in the citation category. In the case of a citation and an arrest, the traffic stop would be categorized as resulting in an arrest.

Table 3.10 reports the severity index for all member-initiated traffic stops in 2009. Across the department, 12.8% of all traffic stops resulted in the issuance of a warning to the driver as the most severe disposition. A large majority of traffic stops resulted in a citation as the most severe outcome (85.7%), while only 1.4% of all traffic stops resulted in a drivers' arrest. Compared to the information reported in Table 3.8, there is a dramatic reduction in the percentage of warnings; that is, the majority of these warnings were issued in combination with either a citation or arrest.

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[4] Searches and seizures were removed from these analyses because they represent a special type of activity and were conducted independent of warnings, citation, and arrests. To create the severity index, all traffic stops that resulted in the classification of "Other" (n=93) were removed due to their rare occurrence and the complexity they introduce to the development of a severity index.

Table 3.10: 2009 Driver Outcomes by Department, Area, Troop & Station (p. 1 of 3)*

	Total # of Stops	% Warning as Most Severe	% Citation as Most Severe	% Arrest as Most Severe
PSP Dept.	306,256	12.8	85.7	1.4
AREA I	55,865	11.8	85.4	2.7
Troop J	13,680	5.0	90.9	4.1
Avondale	3,236	8.1	87.5	4.4
Embreeville	4,221	4.7	92.4	2.9
Ephrata	1,649	3.5	93.0	3.5
Lancaster	4,574	3.7	91.1	5.3
Troop K	16,650	14.1	83.3	2.6
Media	4,346	25.2	71.1	3.8
Philadelphia	9,825	9.0	89.2	1.8
Skippack	2,479	15.0	81.0	4.0
Troop L	10,954	11.2	87.0	1.7
Frackville	2,263	8.0	90.5	1.5
Hamburg	1,456	5.9	93.7	0.4
Jonestown	3,465	17.4	79.7	2.9
Reading	1,973	8.9	89.6	1.5
Schuylkill Haven	1,797	10.4	88.5	1.1
Troop M	14,581	16.1	81.6	2.3
Belfast	2,673	15.3	83.7	0.9
Bethlehem	1,387	10.5	86.8	2.7
Dublin	2,865	21.4	75.2	3.4
Fogelsville	3,555	20.5	78.2	1.2
Trevose	4,101	10.8	86.0	3.2
AREA II	47,286	12.2	86.6	1.2
Troop F	21,802	12.8	86.1	1.1
Coudersport	1,882	31.1	67.5	1.4
Emporium	1,077	26.1	73.5	0.4
Lamar	3,550	13.1	85.0	1.8
Mansfield	2,286	20.6	78.1	1.3
Milton	3,741	3.6	96.1	0.3
Montoursville	3,699	7.9	90.9	1.3
Selinsgrove	3,494	7.6	92.0	0.4
Stonington	2,073	14.1	84.1	1.8

* 93 traffic stops were reported as "Other" and are not included in these percentages.

Table 3.10: 2009 Driver Outcomes by Department, Area, Troop & Station (p. 2 of 3)

	Total # of Stops	% Warning as Most Severe	% Citation as Most Severe	% Arrest as Most Severe
Troop N	10,602	8.8	90.0	1.2
Bloomsburg	1,857	9.5	90.4	0.2
Fern Ridge	2,489	5.9	93.7	0.4
Hazleton	1,471	10.7	88.1	1.2
Lehighton	1,792	10.0	88.4	1.6
Swiftwater	2,993	9.1	88.5	2.4
Troop P	7,512	15.7	82.9	1.4
Laporte	1,571	21.3	78.1	0.6
Shickshinny	1,113	14.7	84.4	0.9
Towanda	2,088	27.3	71.8	0.9
Tunkhannock	908	6.7	86.6	6.7
Wyoming	1,832	2.8	96.8	0.4
Troop R	7,370	11.9	86.8	1.4
Blooming Grove	1,875	8.6	89.7	1.7
Dunmore	1,887	19.1	80.0	0.9
Gibson	2,266	11.3	87.4	1.3
Honesdale	1,342	7.2	91.1	1.7
AREA III	72,660	15.7	82.9	1.7
Troop A	18,055	14.0	84.4	1.6
Ebensburg	4,008	13.8	84.1	2.1
Greensburg	4,110	20.3	78.3	1.4
Indiana	4,363	16.5	82.7	0.8
Kiski Valley	3,308	8.0	90.1	2.0
Somerset (A)	2,266	7.1	91.0	1.9
Troop G	30,575	20.4	78.9	0.7
Bedford	3,829	31.8	67.2	1.0
Hollidaysburg	2,716	20.4	79.1	0.5
Huntingdon	4,039	31.4	67.4	1.2
Lewistown	5,095	8.4	97.0	0.6
McConnellsburg	5,772	30.4	69.0	0.6
Philipsburg	3,560	19.6	79.7	0.7
Rockview	5,564	5.9	93.7	0.4
Troop H	24,030	10.9	86.8	2.3
Carlisle	6,995	8.5	88.1	3.4
Chambersburg	3,044	9.9	89.5	0.7
Gettysburg	3,312	19.3	78.8	2.0
Harrisburg	2,231	7.8	90.8	1.5
Lykens	1,818	27.6	70.6	1.8
Newport	2,705	6.0	90.1	3.9
York	3,925	6.5	92.3	1.2

Table 3.10: 2009 Driver Outcomes by Department, Area, Troop & Station (p. 3 of 3)

	Total # of Stops	% Warning as Most Severe	% Citation as Most Severe	% Arrest as Most Severe
AREA IV	69,192	16.3	82.1	1.7
Troop C	18,510	21.3	77.6	1.1
Clarion	2,377	26.0	73.7	0.2
Clearfield	4,148	4.4	95.3	0.3
Dubois	3,365	14.6	84.7	0.7
Kane	2,056	23.4	72.6	4.0
Punxsutawney	2,435	34.9	63.3	1.8
Ridgway	2,588	25.5	73.5	1.0
Tionesta	1,541	42.6	56.9	0.5
Troop D	15,928	13.4	84.7	1.9
Beaver	3,380	6.7	92.1	1.3
Butler	3,996	15.9	80.7	3.5
Kittanning	2,581	17.7	79.9	2.4
Mercer	3,107	18.6	80.9	0.5
New Castle	2,864	8.4	90.1	1.4
Troop E	19,221	22.7	75.4	1.9
Corry	1,448	31.0	65.9	3.1
Erie	4,897	20.9	76.6	2.5
Franklin	1,907	38.3	60.1	1.6
Girard	3,417	15.7	82.6	2.0
Meadville	6,399	20.5	78.4	1.1
Warren	1,153	27.4	69.6	3.0
Troop B	15,533	5.4	92.8	1.8
Belle Vernon	2,524	1.8	97.7	0.5
Pittsburgh	3,528	2.2	97.3	0.5
Uniontown	4,675	10.3	85.4	4.3
Washington	3,466	3.5	96.1	0.4
Waynesburg	1,340	8.6	89.5	1.9
Bureau of Patrol	61,127	6.9	92.9	0.2
Troop T	61,127	6.9	92.9	0.2
Bowmansville	9,345	5.7	93.9	0.3
Everett	14,047	4.6	95.2	0.1
Gibsonia	4,505	5.8	94.0	0.2
Highspire	14	50.0	50.0	0.0
King of Prussia	8,904	14.4	85.2	0.5
New Stanton	6,600	6.2	93.5	0.2
Newville	7,428	2.3	97.6	0.1
Pocono	5,299	8.3	91.6	0.1
Somerset (T)	4,985	8.8	91.0	0.1

SUMMARY

Section 3 reported the characteristics of traffic stops and stopped drivers at the department, area, troop, and station levels based on 306,256 member-initiated traffic stops from January 1, 2009 through December 31, 2009. Department-wide trends are reported below. Trends at the area, troop, and station levels are reported within this section.

- Across the department, the majority of traffic stops had the following characteristics:
  o Occurred on a weekday (68.4%)
  o Occurred during the daytime (74.3%)
  o Occurred on a state highway (52.3%) or an interstate (44.0%)
  o Involved a vehicle registered in Pennsylvania (78.8%)
  o Involved vehicles with an average of 0.7 passengers
  o Lasted between 1-15 minutes (89.9%)
  o March and May accounted for the largest percentages of traffic stops

- Across the department, characteristics of the stop included:
  o The most frequent violation observed prior to traffic stops was speeding (69.0%), followed by moving violations (17.4%), and equipment inspections (9.0%)
  o For speeding stops, the average amount over the limit was 19.4 mph

- Across the department, characteristics of the drivers included:
  o Average age of 35.3 years
  o 66.9% male
  o White (83.6%), Black (8.8%), Hispanic (3.4%), Middle Eastern (2.0%), and Asian/Pacific Islander (1.8%)
  o Non-resident of the municipality in which they were stopped (94.9%), non-resident of the county in which they were stopped (64.6%), and non-Pennsylvania resident (24.2%)

- Across the department, traffic stop outcomes can be summarized by the following characteristics:
  o 28.3% of stops resulted in a warning issued to the driver
  o 86.6% of stops resulted in a citation issued to the driver
  o 1.4% of stops resulted in the arrest of the driver
  o 1.1% of stops resulted in a search of either the occupant(s) and/or the vehicle
  o Of the searches conducted, 28.0% resulted in the discovery of contraband
  o Severity scale:
    o Warning was most severe outcome = 12.8% of stops
    o Citation was most severe outcome = 85.7% of stops
    o Arrest was most severe outcome = 1.4% of stops

4. TREND ANALYSES I: TRAFFIC STOPS 2002 – 2009

OVERVIEW

This section documents the rate of Black and Hispanic drivers stopped by PSP Troopers between 2002 and 2009. These trends are reported at the department and troop levels (Appendix A summarizes the station level trends). In this section and all subsequent sections involving temporal trends, no analyses are offered regarding rates of activity at the area level. As described below, temporal trends are based on all previous years of data collection and are only applicable to organizational units that are consistent in composition from year to year. In 2008, the PSP underwent an agency-wide re-organization, which significantly altered the composition of all areas. Thus, comparing the rate of activity within Area I between 2002 and 2009, for example, would be inappropriate due to the difference in troop and station composition. All temporal analyses are restricted to the department, troop, and station levels.

METHODOLOGY

Temporal analyses are best used to summarize the rate of activity (i.e., the rate of traffic stops of a selected group) within organizational units across time. This section exclusively uses this type of analysis to compare the rate of traffic stops of Black and Hispanic citizens within one organizational unit. In this manner, the rates from year to year in a jurisdiction are comparable. Importantly, changes in the rate of traffic stops within that organizational unit may result from a variety of factors including differences in traffic patterns, alterations of driver behaviors, modifications of officer behavior, and/or officer deployment practices; however, any changes in the rate of traffic stops will not be affected by changes in other jurisdictions. In effect, differences between organizational units are considered in these analyses and do not influence the results. As a result, the strength of documenting temporal trends is to examine differences within organizational units across time.

Standard Deviation Methodology

The temporal trends of Black and Hispanic drivers stopped by PSP Troopers were constructed using a standard deviation analysis technique. This approach relies on the previous years' data as the key component in reporting the spectrum of activity that occurred within one organizational unit. The rate of traffic stops could range from considerably less activity relative to the normal rate (i.e., one or more standard deviational units below the average) to considerably more activity compared to the normal rate (i.e., one or more standard deviational units above the average). Based on probability theory, the majority of values (i.e., the rate of traffic stops) will fall within one standard deviation of the average. Fewer cases will be within two standard deviations of the average, and even fewer values within three standard deviations.

To create the standard deviation, the following steps were used:
   a. Calculate an average rate of traffic stops. For Black and Hispanic drivers, the rate of traffic stops between 2002 and 2008 was used to compute an average rate for the organizational unit of interest. The current year (2009) was not included in the

average because it is the data point of most interest and should not be included in the average for comparison purposes.

    b. <u>Calculate standard deviation using the seven-year average rate of traffic stops.</u> The standard deviation is a standardized measure of variability based on the changes in the rate of traffic stops across all years. Again, the 2009 rate was not included in the average, as it is the focal point of this report. Inclusion of its rate would bias the development of the standard deviation.

    c. <u>Compare the 2009 rate of traffic stops to the seven-year average using the standard deviation.</u> The seven-year average and three standard deviations in either direction comprise the background of each graph. For all eight years (i.e., 2002-2009), the actual values of traffic stops for the target group are plotted on the graph to allow an assessment of the 2009 rate of traffic stops in relation to the seven-year average and the standard deviational values.

Standard Deviation Interpretation

The aforementioned methodology is applied to traffic stops of Black and Hispanic drivers at the department and troop levels. For each organizational unit and race/ethnicity, a graph shows the seven-year average represented by a solid black line. Moving up and down from this central number are the values for one, two, and three standard deviations above and below the seven-year average, respectively. The red line indicates the actual rate of traffic stops for each year. The interpretation is straightforward: if the red line is above the seven-year average at one time point, the rate for that year was above the average; similarly, if the red line is below the black line, the rate for that year was below the average.

Each graph includes text indicating how the 2009 rate of traffic stops compares to the value of the standard deviation (based on the previous seven years). This provides a simple method to assess any of the eight years of data in relation to the seven-year trend, while also offering substantive information regarding the difference between the specific year and the average. In summary, each graph reports the following information:

- the actual rate of traffic stops for each year
- each year's rate of traffic stops in relation to the seven-year average
- each year's rate of traffic stops in standard deviational units
- the overall trend of traffic stops

The standard deviation is a measure of variation in the rate of traffic stops for one organizational unit based on seven years of data collection. The research team purposefully does not offer a value assessment of the 2009 rate in relation to the seven-year average. In other words, the research team does not assign a "cutoff value" for an acceptable rate of traffic stops (i.e., a standard deviational value at which any rate of traffic stops above or below is concerning). The graphs demonstrating temporal values are strictly a tool to assess trends over time in the rate of traffic stops and to identify organizational units that are experiencing noticeable increases in their rate of traffic stops of Black or Hispanic drivers. There are numerous factors beyond the scope of this methodology that may be directly related to changes in the rate of traffic stops of minority drivers. For example:

- changes in the traffic population within that jurisdiction
- alterations to the reporting patterns by PSP troopers
- adjustments in PSP traffic stop behaviors
- differences in deployment patterns across time
- modifications of manpower allocation

Any single factor or a combination of these factors may influence the rate of traffic stops of minority drivers in any one year and result in an increase or decrease in the rates reported in the graphs below. The following graphs are to be interpreted with caution and cannot be used as evidence of overt biased policing by the PSP or any of its organizational units.

While no definitive conclusions regarding bias in traffic stops can be ascertained from the following graphs, they do offer a basic picture of the traffic stopping trends by organizational unit. The standard deviation is a statistical indicator that offers a range of roughly "average" values. Using this statistic, units experiencing rates of traffic stops within one standard deviation of the seven-year average were operating in a similar fashion to the seven-year average. Organizational units reporting rates of traffic stops more than two standard deviations outside their seven-year average were experiencing a shift from previous years. Any rate of traffic stops beyond three standard deviations is roughly equivalent to achieving statistical significance using a statistical test. Such changes identified should be further examined by PSP administrators to identify the cause of these changes.

TRAFFIC STOPS: 2002 – 2009

The stopping rate of Black and Hispanic drivers by PSP Troopers between 2002 and 2009 is reported in the following graphs. The department rate for Black and Hispanic drivers is reported in Figures 4.1 & 4.2 and the rate of traffic stops for Black and Hispanic drivers at the troop level is summarized in Figures 4.3 – 4.34. Within each graph, the actual rate of activity (i.e., Black or Hispanic traffic stops) is located on the vertical axis and the year of activity is represented on the horizontal axis. Importantly, the scale of the graphs is appropriate for the specific organizational unit of interest reported in that graph and should be consulted prior to reviewing the results. Comparison of trends between organizational units is not recommended due to the difference in scales and due to geographic and organizational differences between units. Information regarding traffic stops at the station level is reported in Appendix A.[5]

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[5] The graphs in Appendix A were not constructed using the standard deviation methodology; rather, they simply report the rate of traffic stops by race/ethnicity between 2002 and 2009. Additional standard deviation analyses at the station level are available from the authors upon request.

Department Level

Figure 4:1: Percent of Traffic Stops with Black Drivers – <u>Department</u>

Figure 4:2: Percent of Traffic Stops with Hispanic Drivers – <u>Department</u>
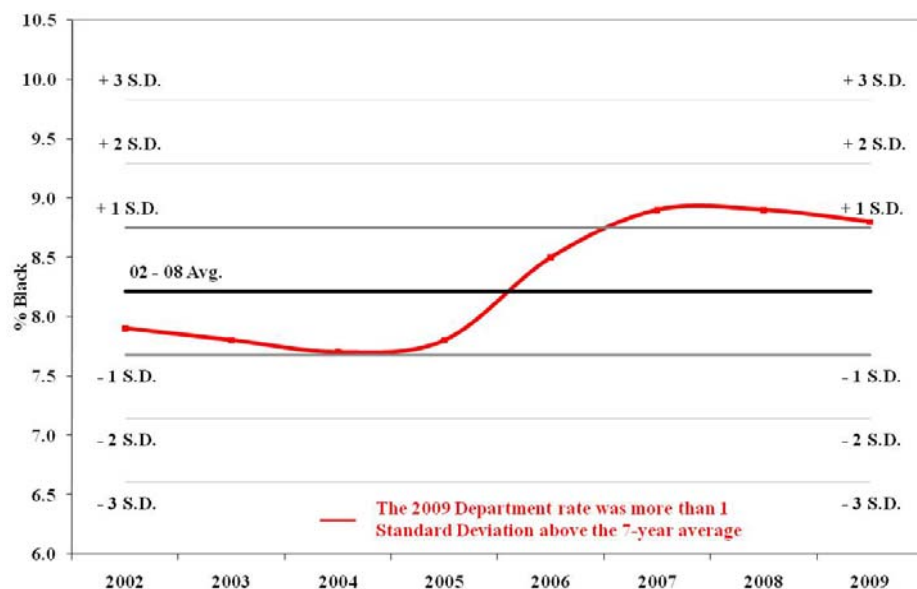
Across the department, the rate of traffic stops involving Black drivers was 8.8% in 2009 and relatively unchanged from 2008. As demonstrated in Figure 4.1, the rate of traffic stops involving Black drivers increased in 2006 and 2007 after several years of relative stability, and remained stable in 2008. The 2009 rate was slightly higher than one standard deviation above the seven-year average. This finding is a product of the lower rates between 2002 and 2005. Please refer to the subsequent graphs to determine the specific contributions of each lower organizational unit.

As demonstrated in Figure 4.2, the rates of traffic stops involving Hispanic drivers dipped slightly below 3.5% for 2009. This represents a slight decrease from the rate of stops of Hispanic drivers in previous years after a noticeable increase in 2004. The 2009 rate of Hispanic traffic stops was within one standard deviation above the seven-year average (i.e., 2002-2008). Please refer to the subsequent graphs to determine the specific contributions of each lower organizational unit.

Troop Level

Figure 4:3: Percent of Traffic Stops with Black Drivers – Troop J

Figure 4:4: Percent of Traffic Stops with Hispanic Drivers – Troop J
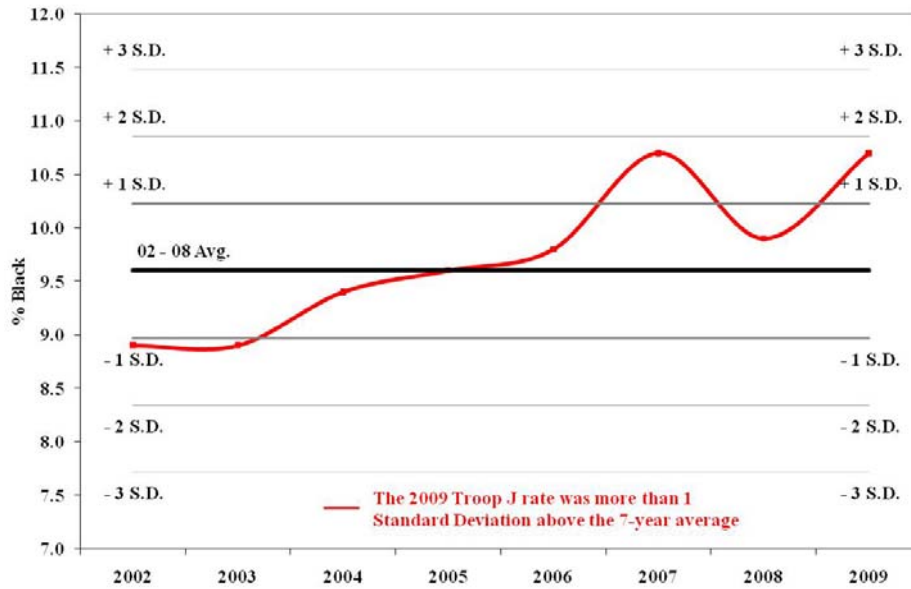
Figure 4.3 displays the rate of traffic stops involving Black drivers in Troop J between 2002 and 2009. Overall, the rate of traffic stops of Black drivers had been increasing since 2003 prior to the reduction in 2008. The decline experienced in 2008 resulted in the rate falling within one standard deviation of the seven-year average. The 2009 rate matches the 2007 rate of 10.7% and ties for the highest rate in any of the eight years available for analysis.

In Troop J, the rate of traffic stops involving Hispanic drivers in 2009 broke a slightly upward trend that began in 2007 falling to 9.8%. As demonstrated in Figure 4.4, the 2009 rate was still within one standard deviation of the seven-year average for this organizational unit. The lowest rate occurred in 2003 and preceded a noticeable increase in the 2004 and 2005 rates.

Figure 4:5: Percent of Traffic Stops with Black Drivers – <u>Troop K</u>

Figure 4:6: Percent of Traffic Stops with Hispanic Drivers – <u>Troop K</u>
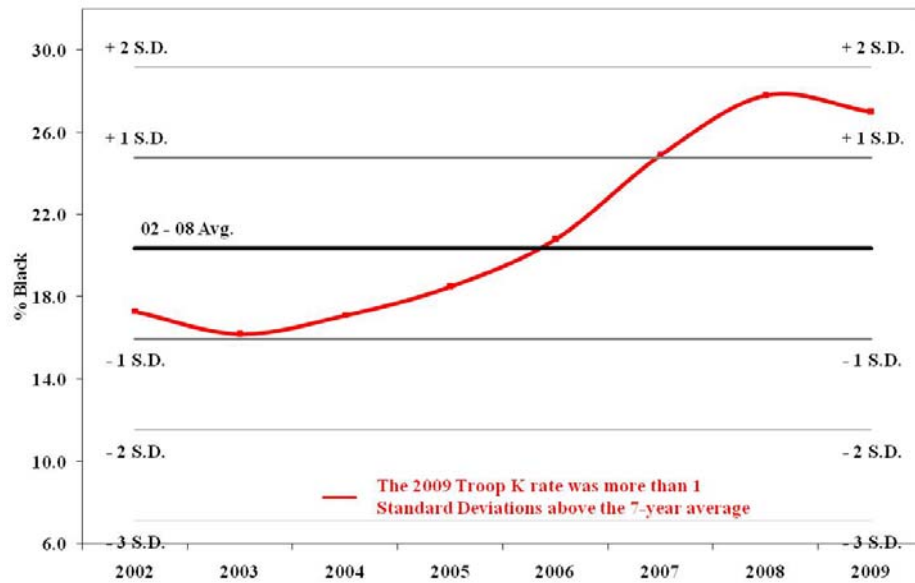
The 2009 rate of traffic stops involving Black drivers in Troop K was more than one standard deviation above the seven-year average for this organizational unit. As reported in Figure 4.5, the rate began increasing in 2004 and maintained that trend through 2008. The 2009 rate dropped slightly to 27%.
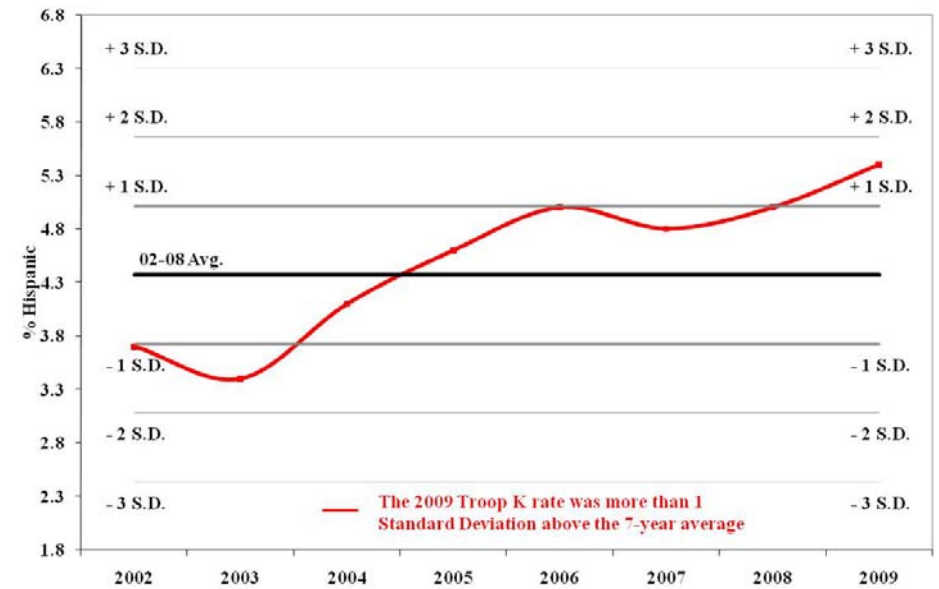
The rate of traffic stops involving Hispanic drivers in Troop K between 2002 and 2009 are reported in Figure 4.6. The 2009 rate rose to 5.4% giving it the highest percent of any year in the eight years available for analysis. The 2009 rate is more than one standard deviation above the seven-year average for this organizational unit.

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Figure 4:7: Percent of Traffic Stops with Black Drivers – <u>Troop L</u>
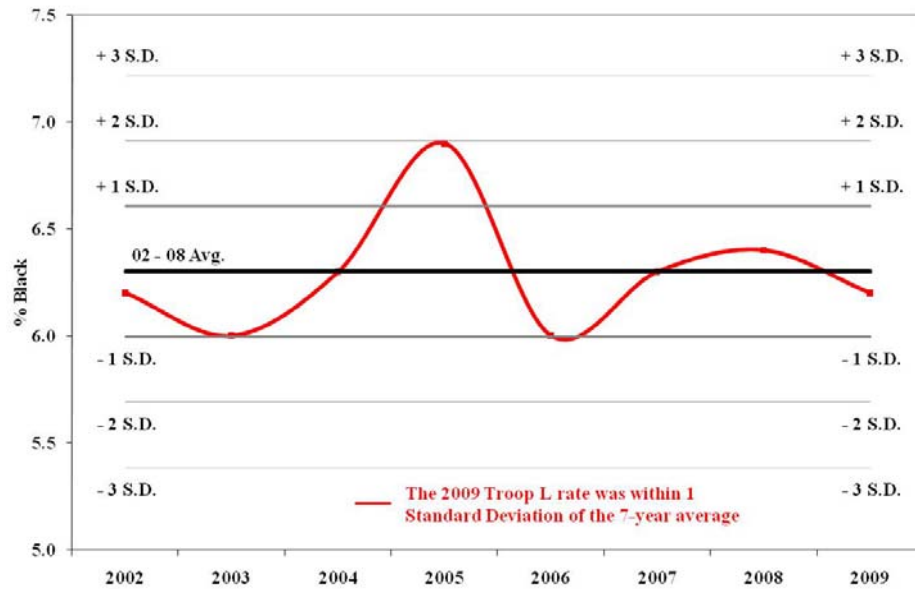
Figure 4.7 reports the rate of traffic stops involving Black drivers in Troop L between 2002 and 2009. In 2009, the rate was similar to the 2008 rate and within one standard deviation of the seven-year average. The highest rate of traffic stops involving Black drivers occurred in 2005.

Figure 4:8: Percent of Traffic Stops with Hispanic Drivers – <u>Troop L</u>
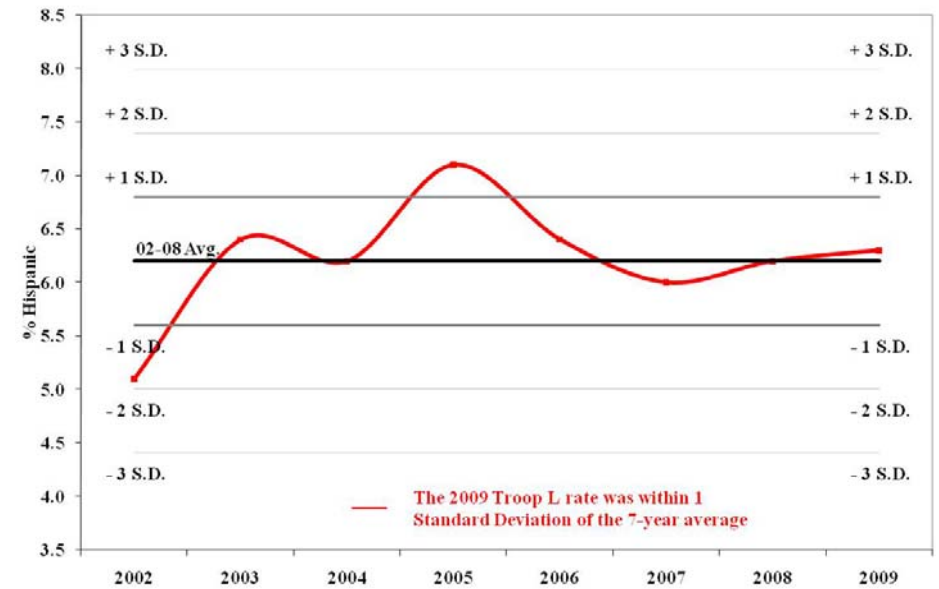
The rate of traffic stops in 2009 involving Hispanic drivers was within one standard deviation of the seven-year average for this organizational unit. As reported in Figure 4.8, the 2009 rate was slightly above the seven-year average and continued the upward trend started in 2008. The lowest rate occurred in 2002 prior to a noticeable increase in subsequent years.

Figure 4:9: Percent of Traffic Stops with Black Drivers – <u>Troop M</u>

Figure 4:10: Percent of Traffic Stops with Hispanic Drivers – <u>Troop M</u>
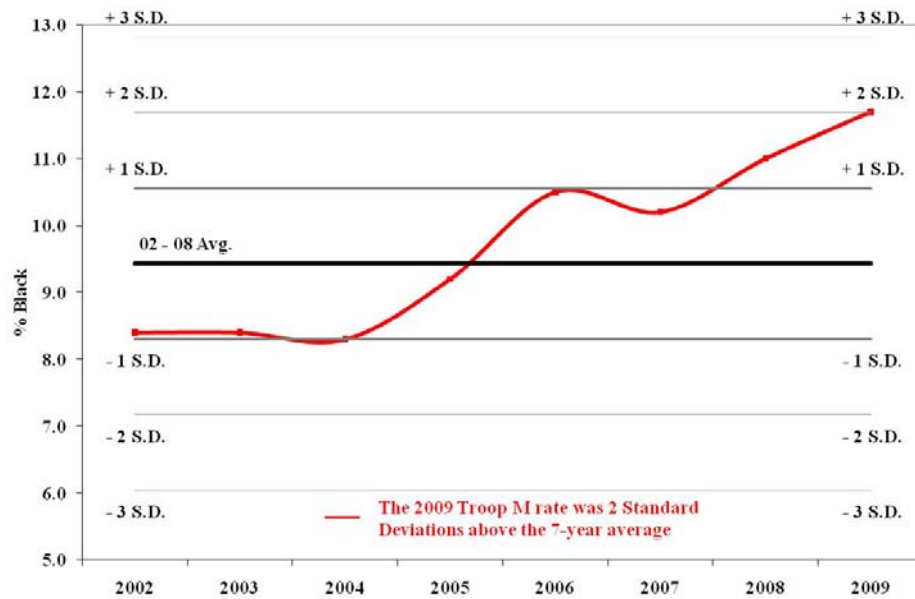
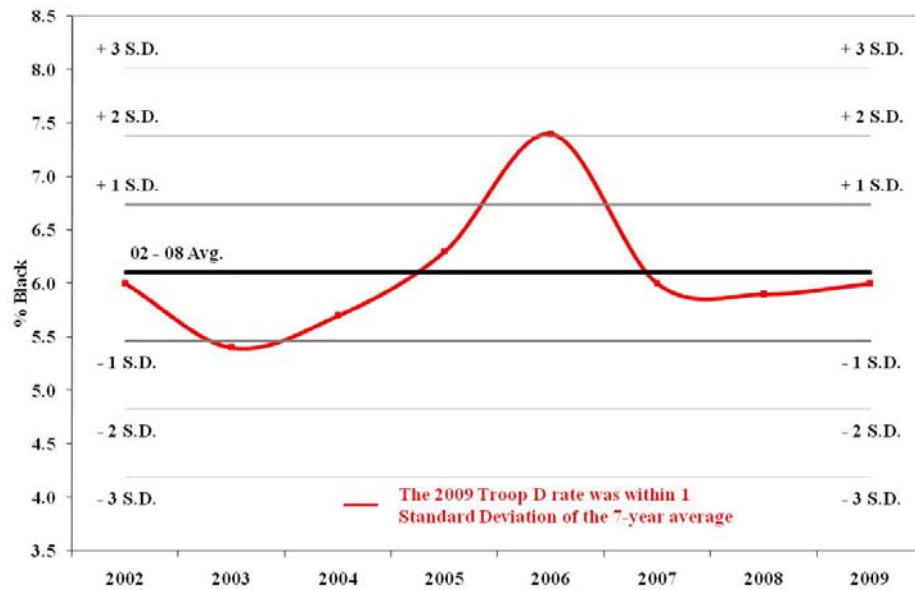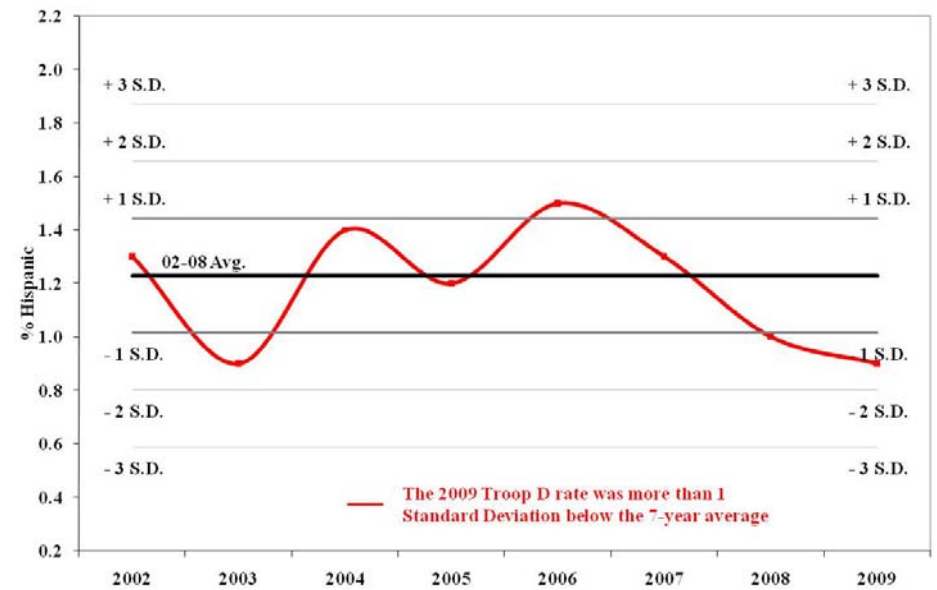

Figure 4.9 displays the rate of traffic stops involving Black drivers in Troop M between 2002 and 2009. The 2009 rate was slightly higher than the 2008 rate and more than two standard deviations above the seven-year average. Previously, the rate was relatively stable between 2002 and 2004 prior to rising in 2005 and 2006.
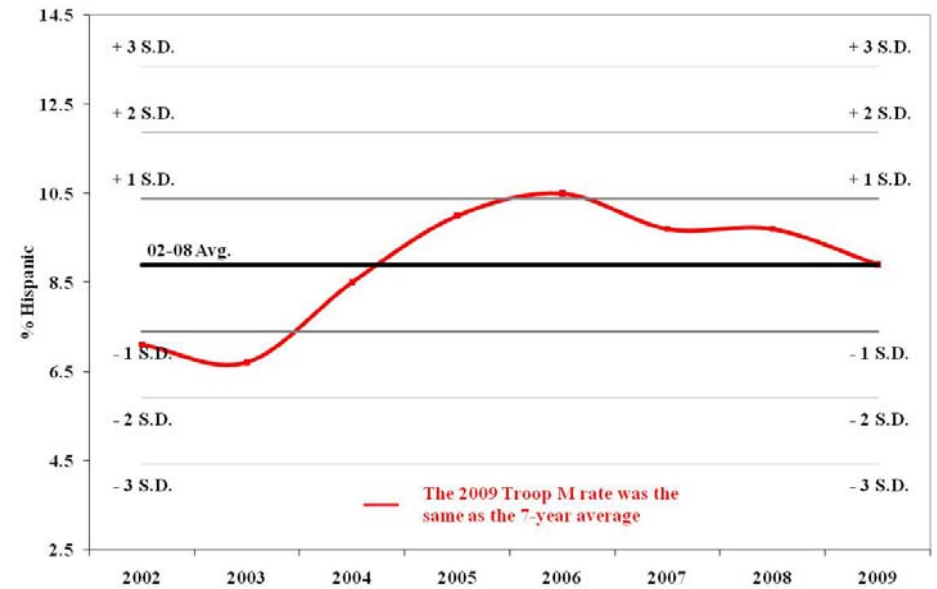
The rate of traffic stops involving Hispanic drivers in Troop M between 2002 and 2009 are reported in Figure 4.10. The 2009 rate is a decrease from the 2008 rate and is identical to the seven year average for this organizational unit. The past five years have been relatively stable after a steady increase between 2003 and 2005.

Figure 4:11: Percent of Traffic Stops with Black Drivers – <u>Troop F</u>

Figure 4:12: Percent of Traffic Stops with Hispanic Drivers – <u>Troop F</u>
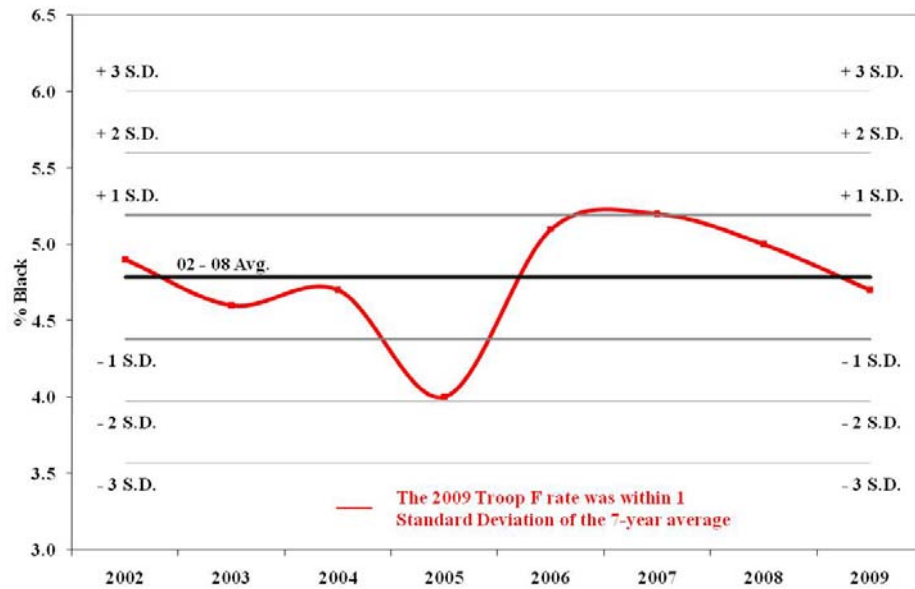
The rate of traffic stops involving Black drivers in Troop F between 2002 and 2009 are reported in Figure 4.11. The 2009 rate is slightly lower than the 2008 rate and is within one standard deviation of the seven-year average for this organizational unit. The lowest rate was reported in 2005, but has been relatively stable in the last three years.
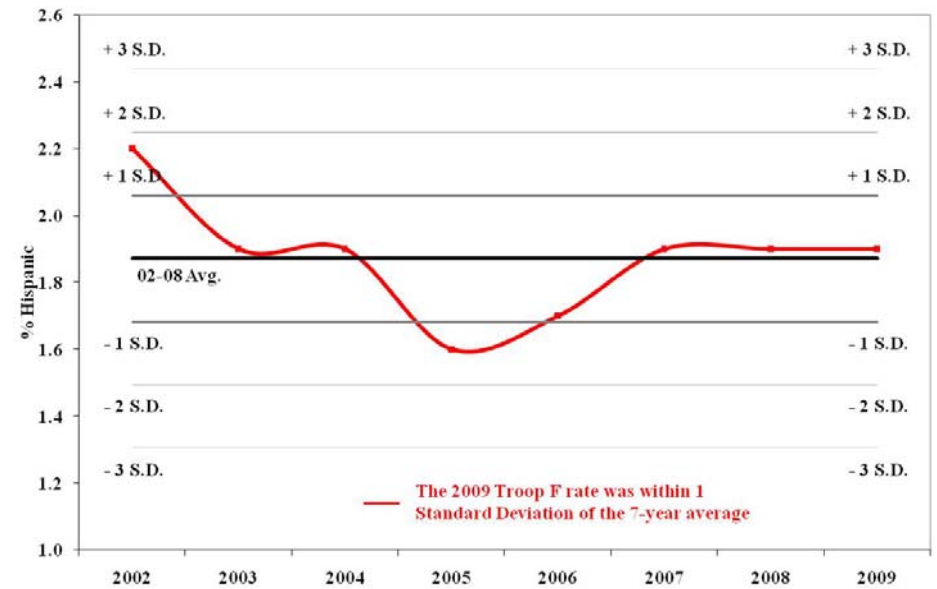
In 2009, the rate of traffic stops involving Hispanic drivers in Troop F was nearly identical to the 2007 and 2008 rates and was within one standard deviation of the seven-year average for this organizational unit. As demonstrated in Figure 4.12, the rate declined steadily between 2002 and 2005 before increasing in 2006 and stabilizing in 2007.

Figure 4:13: Percent of Traffic Stops with Black Drivers – <u>Troop N</u>

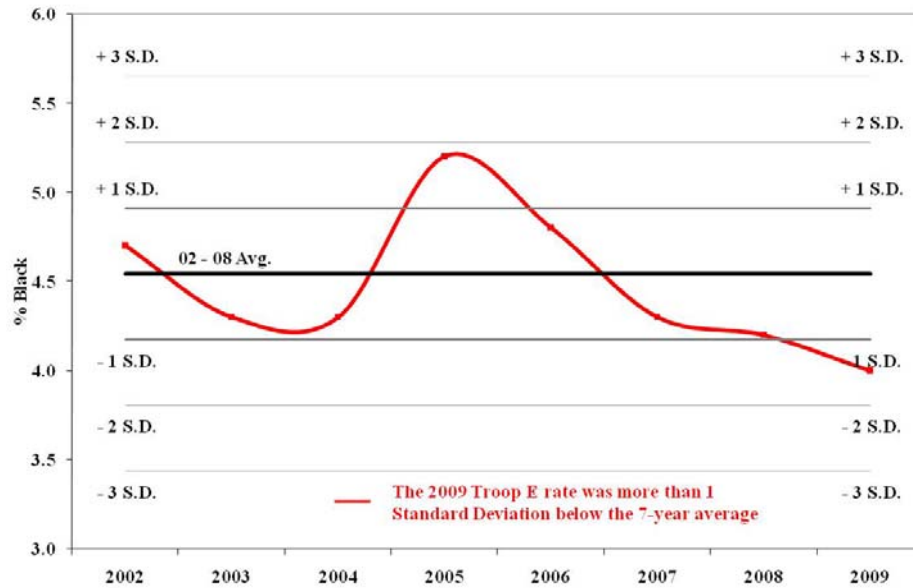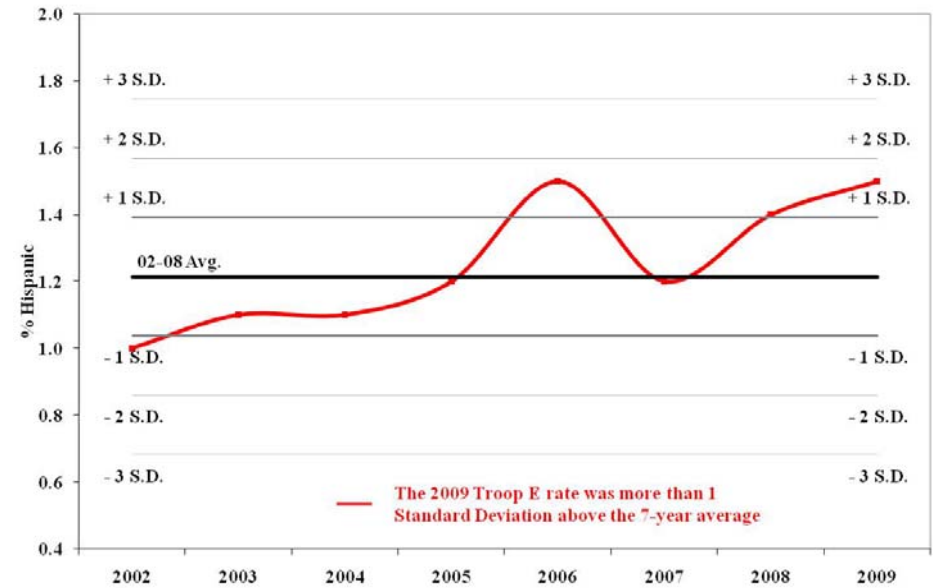**Figure 4:14: Percent of Traffic Stops with Hispanic Drivers – <u>Troop N</u>**
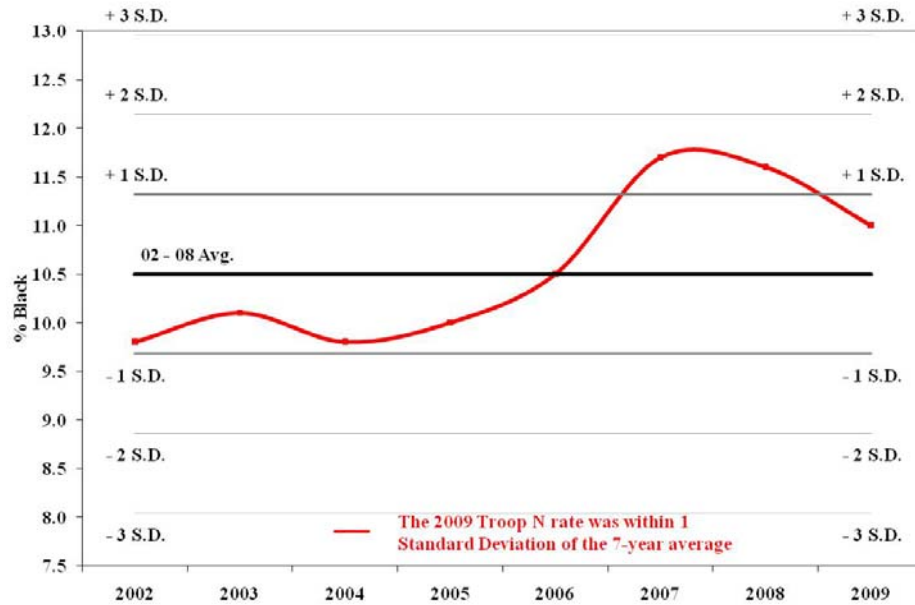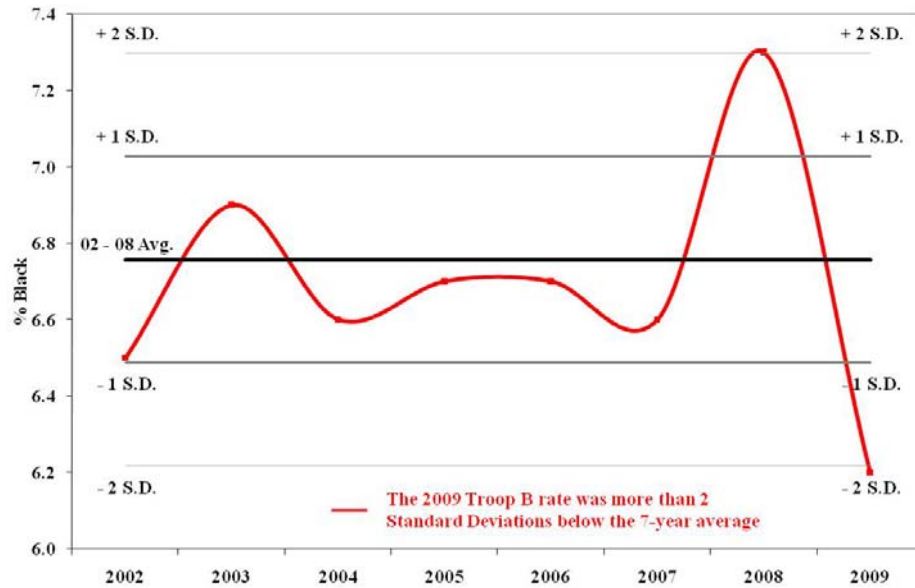

Figure 4.13 displays the rate of traffic stops involving Black drivers in Troop N between 2002 and 2009. The 2009 rate is lower than the previous year and is within one standard deviation of the seven-year average for this organizational unit. An upward trend began in 2005 prior to stabilizing in the past two years.
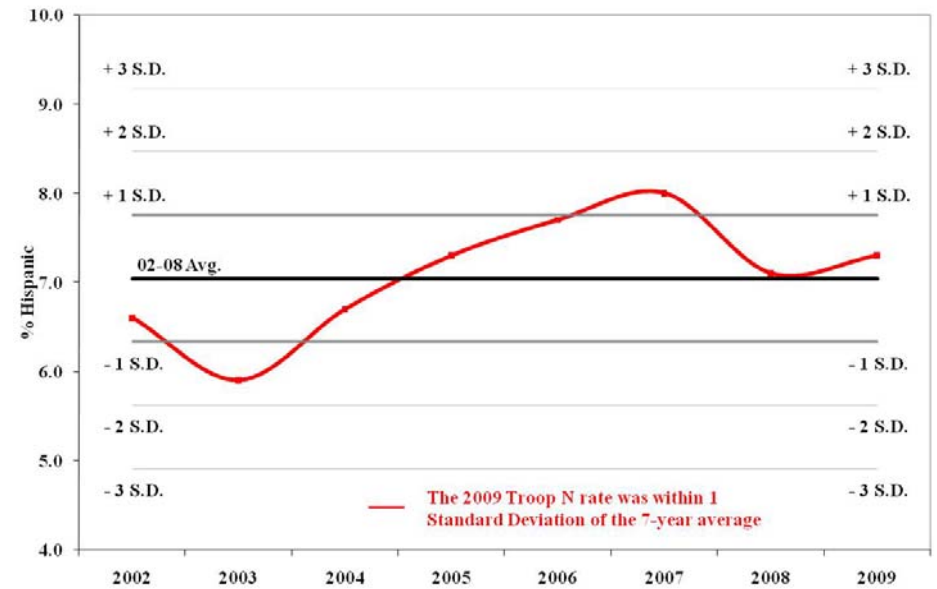
Figure 4.14 displays the rate of traffic stops involving Hispanic drivers in Troop N between 2002 and 2009. The 2008 rate was lower than in 2007 and closely mirrored the seven-year average. The 2009 rate returned to the upward trend that started in 2004. The lowest rate occurred in 2003 and represented a decline from the 2002 rate.

Figure 4:15: Percent of Traffic Stops with Black Drivers – <u>Troop P</u>

Figure 4:16: Percent of Traffic Stops with Hispanic Drivers – <u>Troop P</u>
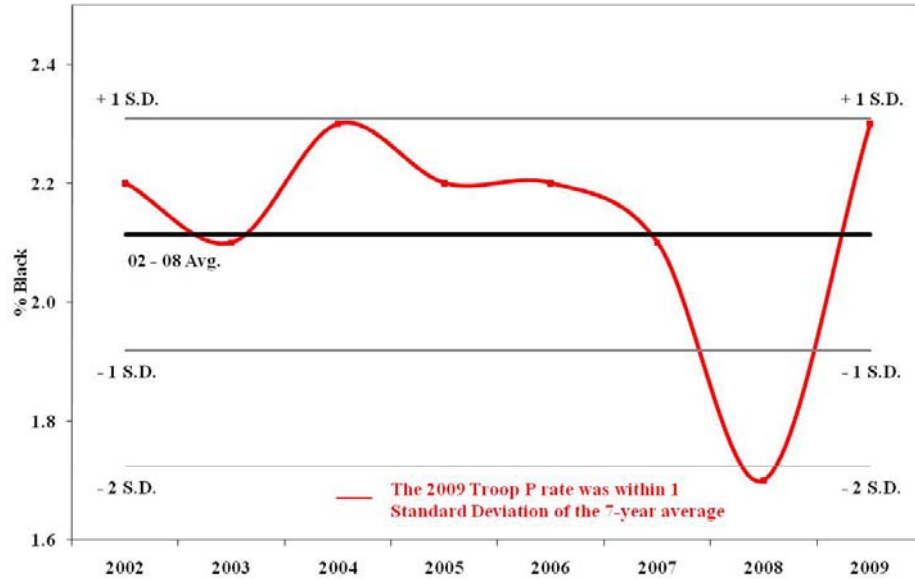
The rate of traffic stops involving Black drivers in Troop P between 2002 and 2009 is reported in Figure 4.15. The 2009 rate increased drastically from the 2008 rate and broke a downward trend originating in 2005. It was within one standard deviation of the seven-year average.
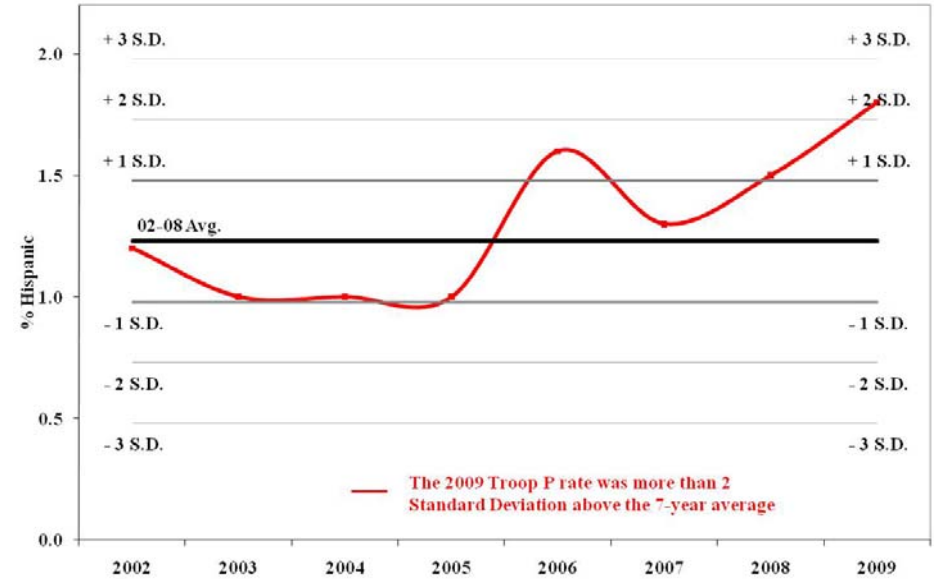
The rate of traffic stops involving Hispanic drivers in Troop P between 2002 and 2009 is reported in Figure 4.16. The 2009 rate was more than two standard deviations above the seven-year average for this organizational unit. After several years of relative stability, the rate increased in 2006, decreased in 2007, and increased in 2008 and 2009.

Figure 4:17: Percent of Traffic Stops with Black Drivers – <u>Troop R</u>

Figure 4:18: Percent of Traffic Stops with Hispanic Drivers – <u>Troop R</u>
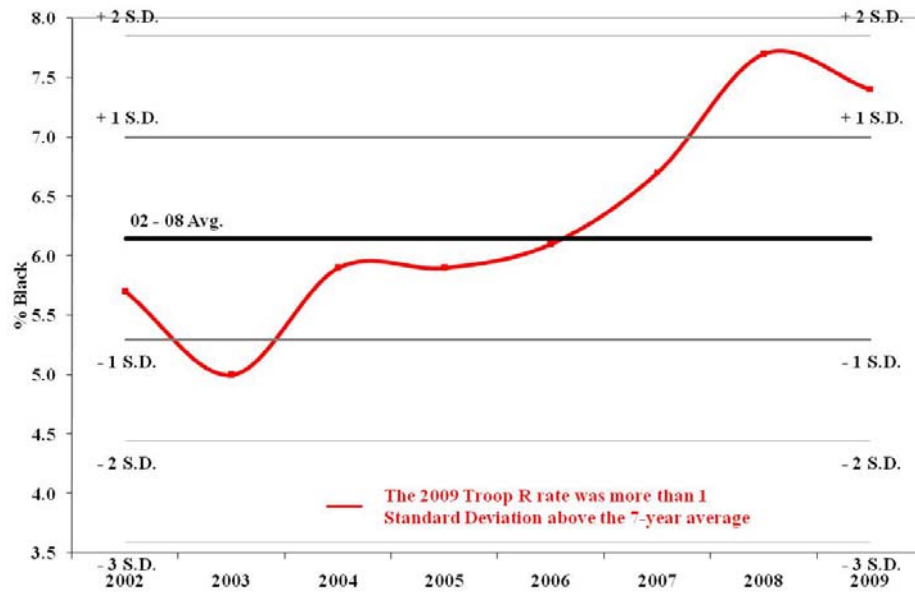
Figure 4.17 displays the rate of traffic stops involving Black drivers in Troop R between 2002 and 2009. Since 2003, the rate has steadily increased until this year. The 2009 rate dropped to 7.4%, but after the increases of the last three years, remains more than one standard deviation above the seven-year average for this organizational unit.
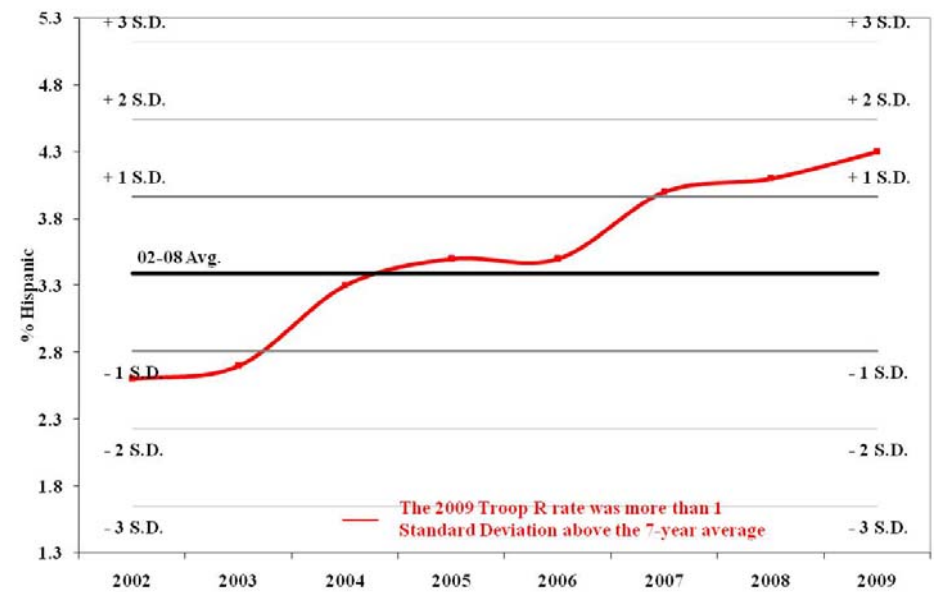
The rate of traffic stops involving Hispanic drivers in Troop R has been steadily increasing since data collection began in 2002. As demonstrated in Figure 4.18, the lowest rate was 2.6% in 2002, while the 2009 rate was the highest at 4.3%. As a result, the 2009 rate was more than one standard deviation above the seven-year average for this organizational unit.

Figure 4:19: Percent of Traffic Stops with Black Drivers – <u>Troop A</u>   **Figure 4:20: Percent of Traffic Stops with Hispanic Drivers – <u>Troop A</u>**
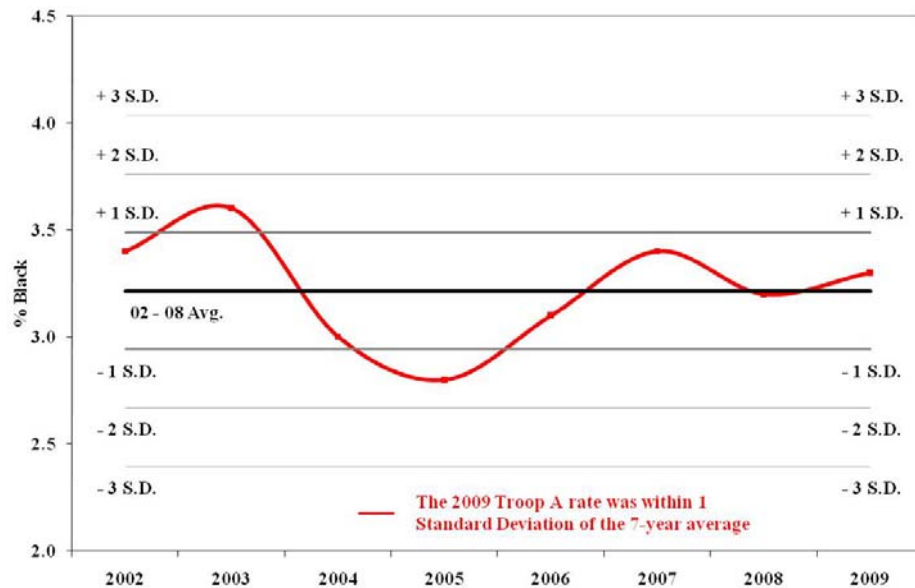
Figure 4.19 displays the rate of traffic stops for Black drivers in Troop A between 2002 and 2009. The 2009 rate was slightly above the seven-year average and was within one standard deviation of the seven-year average for this organizational unit. After higher rates in 2002 and 2003, the rates fell in 2004 and 2005 and increased again in 2006 and 2007. There was a decrease in 2008 and a slight increase in 2009.
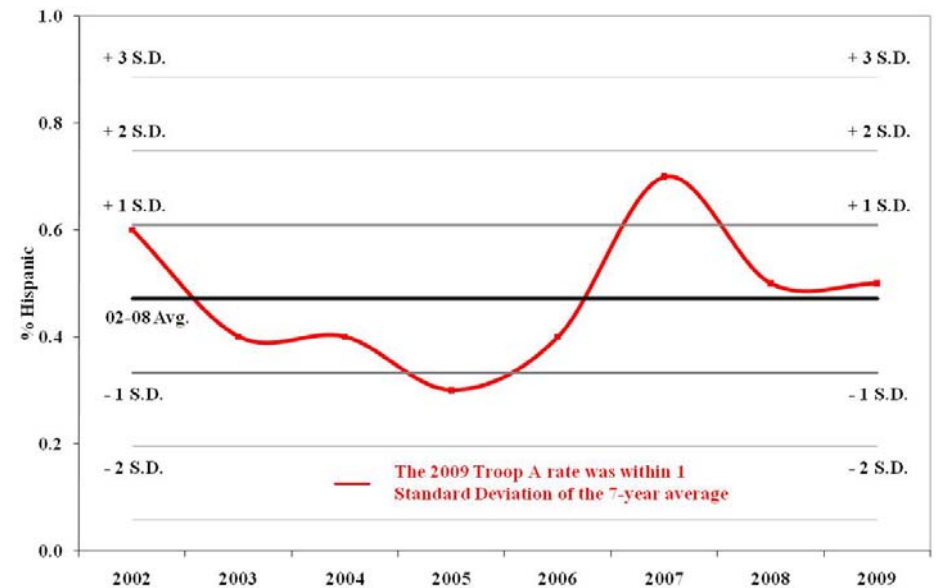
The rate of traffic stops involving Hispanic drivers in Troop A between 2002 and 2009 is reported in Figure 4.20. The 2009 rate was identical to the 2008 rate and within one standard deviation of the seven-year average. There has been little stability in the eight-year trend, with initial declines between 2002 and 2005 prior to increases in 2006 and 2007.

Figure 4:21: Percent of Traffic Stops with Black Drivers – Troop G

Figure 4:22: Percent of Traffic Stops with Hispanic Drivers – Troop G
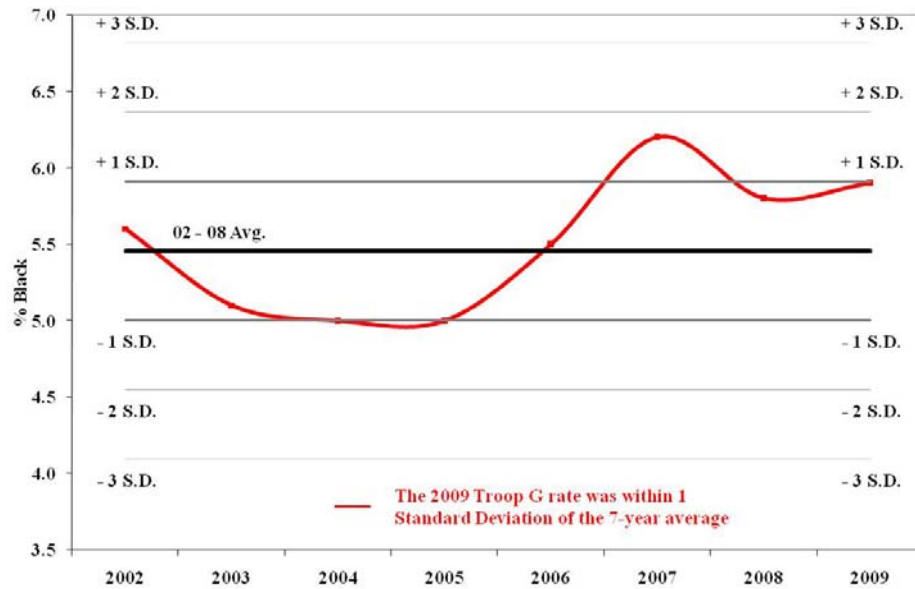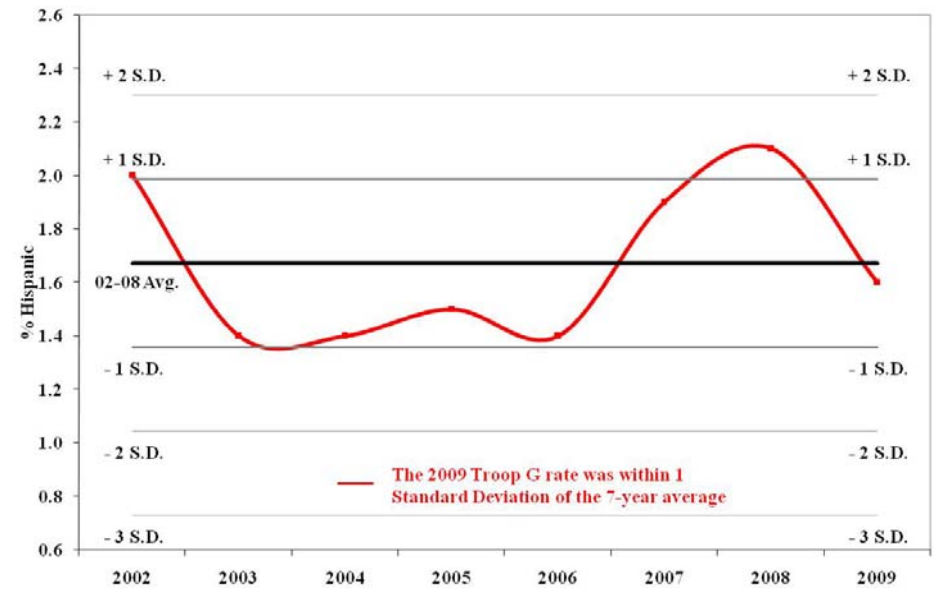

Figure 4.21 displays the rate of traffic stops for Black drivers in Troop G between 2002 and 2009. The 2009 rate was slightly higher than the 2008 rate and within one standard deviations of the seven-year average for this organizational unit. The 2008 rate stemmed an upward trend that began in 2006. Assessing the longer trend indicates that the rates initially dipped in 2003 and remained relatively unchanged until the increase in 2006.

The rate of traffic stops involving Hispanic drivers between 2002 and 2009 is reported in Figure 4.22 for Troop G. The 2009 rate is within one standard deviation above the seven-year average for this organizational unit and stemmed the upward trend initiated in 2007. Throughout the seven years of data collection, the highest rate of traffic stops involving Hispanic drivers occurred in 2008.

Figure 4:23: Percent of Traffic Stops with Black Drivers – <u>Troop H</u>

Figure 4:24: Percent of Traffic Stops with Hispanic Drivers – <u>Troop H</u>
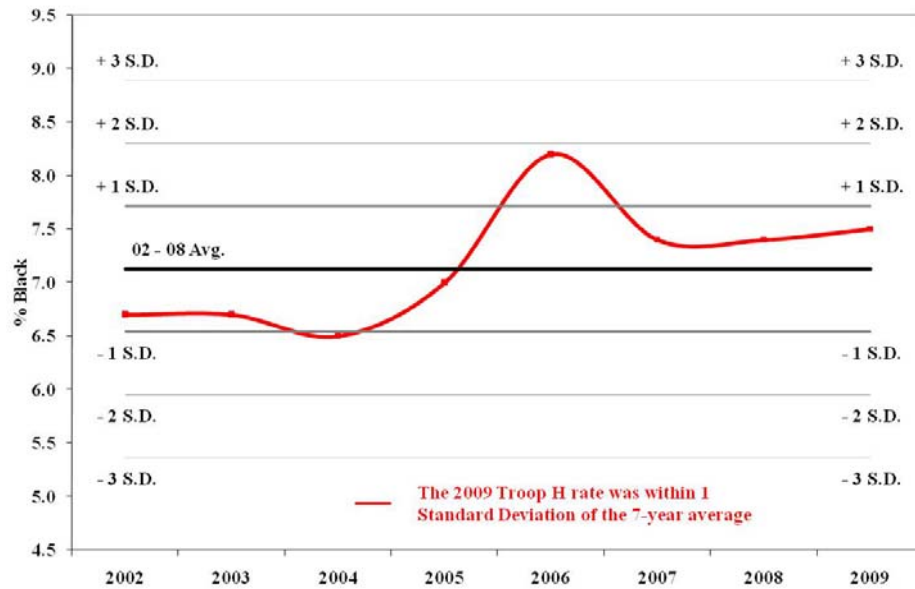
As reported in Figure 4.23, the 2009 rate of traffic stops involving Black drivers in Troop H was within one standard deviation of the seven-year average for this organizational unit. This rate represented a slight increase from the identical rates found in 2007 and 2008. Across all years, there is consistency in activity except for the increase between 2004 and 2006.
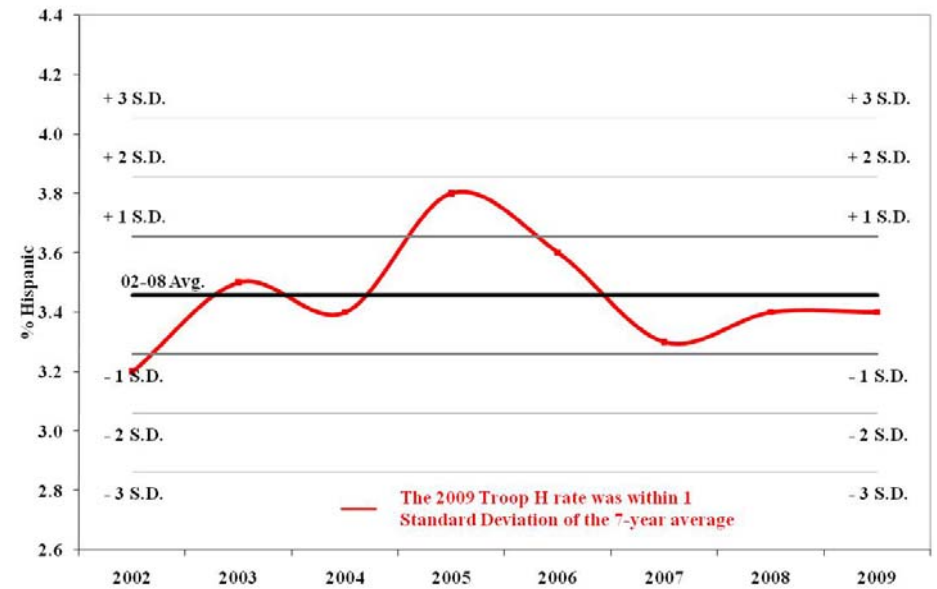
The rate of traffic stops involving Hispanic drivers in Troop H between 2002 and 2009 is reported in Figure 4.24. The 2009 rate was identical to the 2008 rate, and was within one standard deviation of the seven-year average in this organizational unit. The 2008 rate broke the downward trend that began in 2006. The lowest rate was reported in 2002.

Figure 4:25: Percent of Traffic Stops with Black Drivers – <u>Troop C</u>

Figure 4:26: Percent of Traffic Stops with Hispanic Drivers – <u>Troop C</u>
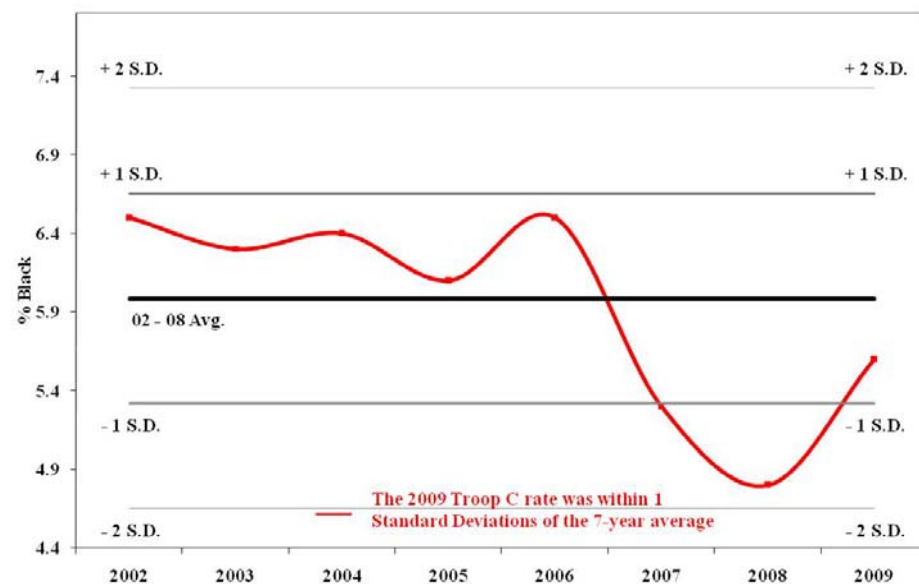
The rate of traffic stops involving Black drivers between 2002 and 2009 are reported for Troop C in Figure 4.25. The 2009 rate exhibited a noticeable increase from 2008 and stemmed a downward trend that began in 2007. The 2009 rate was within one standard deviational unit of the seven-year average for this organizational unit. Prior to 2007, the rate was relatively unchanged, with some variation in 2005 and 2006.

Figure 4.26 displays the rate of traffic stops for Hispanic drivers in Troop C between 2002 and 2009. The 2009 rate stemmed a downward trend that began in 2007 and was more than one standard deviation below the seven-year average for this organizational unit. The general trend for all eight years is a slight decrease with year-to-year fluctuations. The highest rate occurred in 2002 and 2004, while 2008 reported the lowest rate to date.

Figure 4:27: Percent of Traffic Stops with Black Drivers – <u>Troop D</u>

Figure 4:28: Percent of Traffic Stops with Hispanic Drivers – <u>Troop D</u>

Figure 4.27 displays the rate of traffic stops involving Black drivers in Troop D between 2002 and 2009. The 2009 rate was relatively unchanged from both the previous year and the seven-year average for this organizational unit. The 2009 rate was also within one standard deviation of the seven-year average. The lowest rate occurred in 2003 and the highest rate in 2006.

The rate of traffic stops involving Hispanic drivers in Troop D between 2002 and 2009 is reported in Figure 4.28. The 2009 rate was more than one standard deviation below the seven-year average for this organizational unit and continues a downward trend that began in 2007. The 2003 rate was the lowest rate of traffic stops involving Hispanic drivers since data collection was initiated.

Figure 4:29: Percent of Traffic Stops with Black Drivers – <u>Troop E</u>

Figure 4:30: Percent of Traffic Stops with Hispanic Drivers – <u>Troop E</u>

Figure 4.29 displays the rate of traffic stops involving Black drivers in Troop E between 2002 and 2009. The 2009 rate was slightly less than the 2008 rate and continued the downward trend initiated in 2006. The 2009 rate was more than one standard deviation below the seven-year average for this organizational unit. It also marked the lowest rate on record in contrast to the 2005 rate, which represented the highest rate in any of the eight years of data collection.

The rate of traffic stops involving Hispanic drivers in Troop E between 2002 and 2009 is reported in Figure 4.30. The 2009 rate was more than one standard deviation above the seven-year average for this organizational unit. The 2009 rate also represented an increase from the 2008 rate; the 2002 rate remains the lowest of any of the seven years.

Figure 4:31: Percent of Traffic Stops with Black Drivers – <u>Troop B</u>

Figure 4:32: Percent of Traffic Stops with Hispanic Drivers – <u>Troop B</u>

The rate of traffic stops involving Black drivers in Troop B between 2002 and 2009 is reported in Figure 4.31. The 2009 rate decreased dramatically from 2008, was the lowest on record, and was more than two standard deviations below the seven-year average. The highest rate is seen in 2008 and is preceded by three years of relative stability.
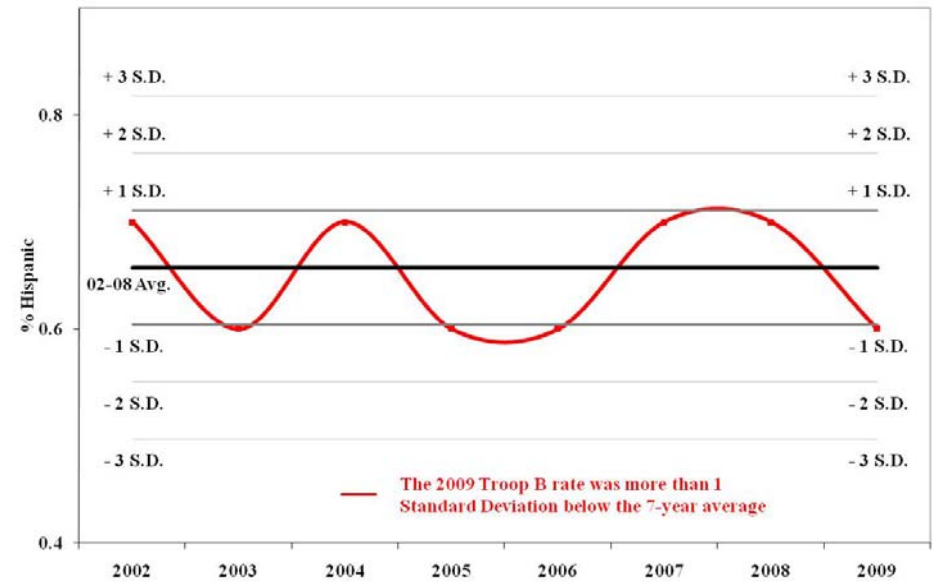
Figure 4.32 displays the rate of traffic stops involving Hispanic drivers in Troop B between 2002 and 2009. The 2009 rate was more than one standard deviation below the seven-year average for this troop. Across the eight years of data collection, Troop B's rate fluctuated from a high of 0.7% in 2002, 2004, 2007, and 2008 to a low of 0.6% in 2003, 2005, 2006, & 2009. Overall, the change in rates is not large and indicates few encounters with Hispanic drivers in Troop B.

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Figure 4:33: Percent of Traffic Stops with Black Drivers – <u>Troop T</u>

Figure 4:34: Percent of Traffic Stops with Hispanic Drivers – <u>Troop T</u>
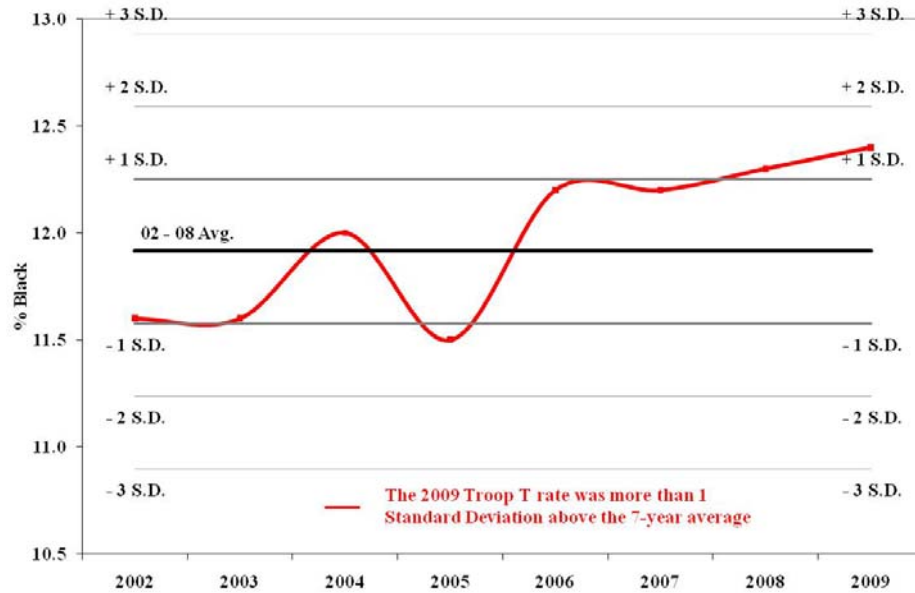
Figure 4.33 displays the rate of traffic stops involving Black drivers between 2002 and 2009 in Troop T. The 2009 rate was slightly higher than the 2008 rate and was more than one standard deviation above the seven-year average for this organizational unit. These most recent years represent the highest rate of traffic stops involving Black drivers in any of the eight years of data collection.
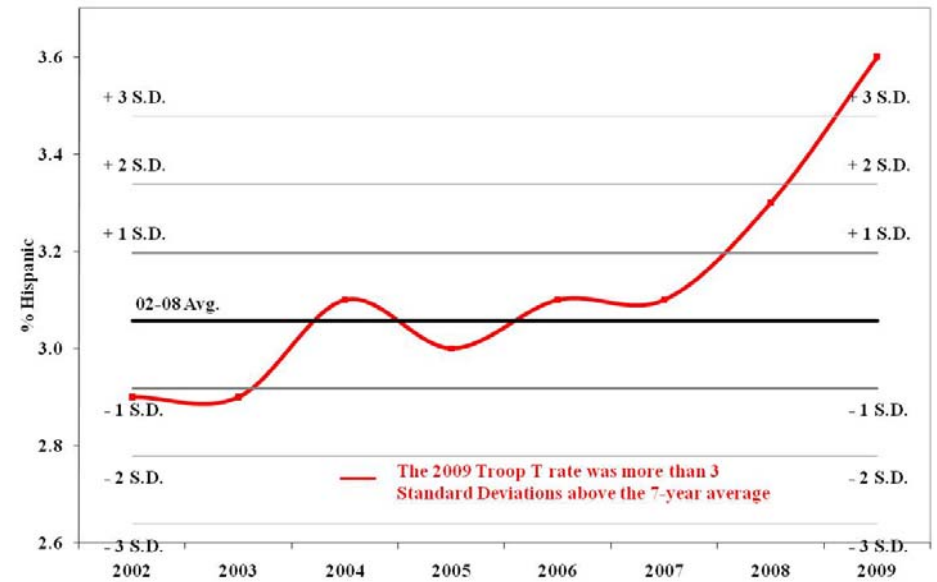
The rate of traffic stops involving Hispanic drivers in Troop T between 2002 and 2009 is reported in Figure 4.34. The 2009 rate continues an upward trend initiated in 2006 and was more than three standard deviations above the seven-year average for this organizational unit. The lowest rates of traffic stops involving Hispanic drivers occurred in 2002 and 2003.

SUMMARY

Section 4 summarizes the trends in traffic stops for Black and Hispanic drivers between 2002 and 2009 at the department and troop levels[6]. It is important to note that the analyses reported in this section are descriptive and cannot be used to determine the causes of the trends reported. The available data simply cannot be used to determine why certain organizational units reported increases in the percentage of stops involving Black or Hispanic drivers. Some factors potentially responsible for upward trends include:

- Changes in the racial/ethnic composition of residential populations serviced by those organizational units which have altered the racial/ethnic composition of drivers eligible to be stopped
- Alterations to the reporting patterns by PSP troopers
- Other changes in travel patterns that differentially impact the percentages of minority drivers on particular roadways
- Adjustments to PSP deployment patterns and manpower allocation to address changes in reported criminal patterns and calls for service, resulting in higher concentrations of Troopers in areas where minorities are more likely to travel and/or violate the law
- Trooper behavior toward minority drivers may have changed across time

Importantly, it is not possible to conclusively determine that an upward trend in traffic stops indicates racially biased behavior by PSP Troopers. One factor or a combination of factors listed above may be responsible for such trends.

The major findings of the traffic stop temporal analyses are:

- <u>Department wide</u>, the 2009 rate of traffic stops involving Black drivers was 8.8% in 2009 and relatively unchanged from 2008. The 2009 rate was slightly higher than one standard deviation above the seven-year average.
- <u>Department wide</u>, the 2009 rate of traffic stops involving Hispanic drivers 3.5%, which represents a slight decrease from the rate of stops of Hispanics in previous years. The 2009 rate was within one standard deviation of the seven-year average.

Troop trends for **Black** drivers (n=16 troops):

- Nine troops reported 2009 traffic stop rates of **Black** drivers that were within one standard deviation of the seven-year average (Troops L, F, N, P, A, G, H, C and D)
- <u>Increases</u> in the 2009 rate of traffic stops involving **Black** drivers:
  - Four troops were <u>more</u> than <u>one</u> standard deviation <u>above</u> their seven-year averages (Troops J, K, R and T)
  - One troop was <u>more</u> than <u>two</u> standard deviations <u>above</u> its seven-year average (Troop M)

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[6] No area level rates were reported due to the changes in organizational structure in 2008.

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- No troops were <u>more</u> than <u>three</u> standard deviations <u>above</u> their seven-year averages
- <u>Decreases</u> in the 2009 rate of traffic stops involving **Black** drivers:
  - One troop was <u>more</u> than <u>one</u> standard deviation <u>below</u> its seven-year average (Troop E)
  - One troop was <u>more</u> than <u>two</u> standard deviations <u>below</u> its seven-year average (Troop B)
  - No troops were <u>more</u> than <u>three</u> standard deviations <u>below</u> their seven-year averages

Troop trends for **Hispanic** drivers (n=16 troops):

- Eight troops reported 2009 traffic stop rates of **Hispanic** drivers that were within one standard deviation of their seven-year average (Troops J, L, M, F, N, A, G and H)
- <u>Increases</u> in the 2009 rate of traffic stops with **Hispanic** drivers:
  - Three troops were <u>more</u> than <u>one</u> standard deviation <u>above</u> their seven-year averages (Troops K, R, and E)
  - One troop was <u>more</u> than <u>two</u> standard deviations <u>above</u> its seven-year average (Troop P)
  - One troop was <u>more</u> than <u>three</u> standard deviations <u>above</u> its seven-year average (Troop T)
- <u>Decreases</u> in the 2009 rate of traffic stops with **Hispanic** drivers:
  - Three troops were <u>more</u> than <u>one</u> standard deviation <u>below</u> their seven-year averages (Troops C, D, and B)
  - No troops were <u>more</u> than <u>two</u> standard deviations <u>below</u> their seven-year averages
  - No troops were <u>more</u> than <u>three</u> standard deviations <u>below</u> their seven-year averages

5. TRAFFIC STOP OUTCOMES 2002 - 2009

OVERVIEW

Section 5 reports the temporal trends for warnings, citations, arrests, searches, and seizures between 2002 and 2009. Using the standard deviation methodology, the 2009 rate of all traffic stop outcomes are compared to the seven-year average at the department level in Figures 5.1 – 5.5. Figures 5.6 – 5.10 present the information regarding the department level traffic stop outcomes in bar charts in order to display the rates of traffic stop outcomes by racial/ethnic group.[7] The rates of traffic stop outcomes at the troop are reported in graph format in Figures 5.11 – 5.74, and all station level trends are reported in Appendix B.

As described in Section 4, temporal analyses are best used to summarize the rate of activity (i.e., the rate of traffic stop outcomes of a selected group) <u>within</u> organizational units <u>across</u> time. This section exclusively uses this type of analysis to compare the rate of traffic stop outcomes of Black and Hispanic citizens within one organizational unit. In this manner, the rates from year to year in a jurisdiction are comparable. In effect, differences between organizational units are considered in these analyses and do not influence the results. As a result, the strength of documenting temporal trends is to examine differences within organizational units across time.

The research team purposefully does not offer a value assessment of the 2009 rate in relation to the seven-year average. In other words, the research team does not assign a "cutoff value" for an acceptable rate of traffic stop outcomes. The graphs demonstrating temporal values are strictly a tool to assess trends over time in the rate of traffic stop outcomes and to identify organizational units that are experiencing noticeable increases in their rate of traffic stop outcomes of Black or Hispanic drivers. There are numerous factors beyond the scope of this methodology that may be directly related to changes in the rate of traffic stop outcomes. For example:
- changes in the traffic population within that jurisdiction
- alterations to the reporting patterns by PSP troopers
- adjustments in PSP traffic stop behaviors
- differences in deployment patterns across time
- modifications of manpower allocation

Any single factor or a combination of these factors may influence the rate of traffic stop outcomes of minority drivers in any year and result in an increase or decrease in the rates reported in the graphs below. The following graphs are to be interpreted with caution and cannot be used as evidence of overt biased policing by the PSP or any of its organizational units. While no definitive conclusions regarding bias in traffic stop outcomes can be ascertained from the following graphs, they do offer a basic picture of the traffic stop outcome trends by organizational unit.

For the trends in arrests and searches during traffic stops, it is important to remember that, prior to 2006 there were some data inconsistencies for these outcomes. As documented in the *2003-2004 Final Report*, during focus groups conducted with PSP Troopers in August

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[7] No graphs are presented at the area level due to changes to the organizational structure in 2008.

2005, it was discovered that there were some problems associated with the ongoing data collection project. Specifically, it became apparent that not all Troopers were completing the Contact Data Reports during all member-initiated stops and were, in particular, underreporting traffic stops resulting in arrests and/or searches that resulted in the discovery of contraband. Upon discovery of these discrepancies, the PSP immediately addressed and corrected these issues. Nevertheless, based on the known problems of underreporting of arrests and searches, firm conclusions regarding trends in these outcomes cannot be made.

TRAFFIC STOP OUTCOMES: 2002 – 2009

This section documents the rate of warnings, citations, arrests, searches, and seizures across the department between 2002 and 2009 in Figures 5.1 – 5.5. A standard deviational methodology is applied to traffic stop outcomes of Black and Hispanic drivers at the department level. The standard deviation is a statistical indicator that offers a range of roughly "average" values. Using this statistic, rates of traffic stop outcomes within one standard deviation of the seven-year average were operating in a similar fashion to the seven-year average. Rates of traffic stop outcomes more than two standard deviations outside their seven-year average were experiencing a shift from previous years, and any rate of traffic stop outcomes beyond three standard deviations is roughly equivalent to achieving statistical significance using a statistical test.

For each racial/ethnic group, a solid black line shows the seven-year average. Moving up and down from this central number are the values for one, two, and three standard deviations above and below the seven-year average, respectively. The red line indicates the actual rate of traffic stop outcomes in each year. The interpretation is straightforward: if the red line is above the seven-year average at one time point, the rate for that year was above the average; similarly, if the red line is below the black line, the rate for that year was below the average.

Each graph includes text indicating how the 2009 rate of traffic stop outcomes compares to the value of the standard deviation (based on the previous seven years). This provides a simple method to assess any of the eight years of data in relation to the seven-year trend, while also offering substantive information regarding the difference between the specific year and the average. In summary, each graph reports the following information:
- the actual rate of traffic stop outcomes for each year
- each year's rate of traffic stop outcomes in relation to the seven-year average
- each year's rate of traffic stop outcomes in standard deviational units
- the overall trend of traffic stop outcomes

Figure 5:1: Percent of Traffic Stops Resulting in <u>Warnings</u> – <u>Department</u>

Figure 5:2: Percent of Traffic Stops Resulting in <u>Citations</u> – <u>Department</u>
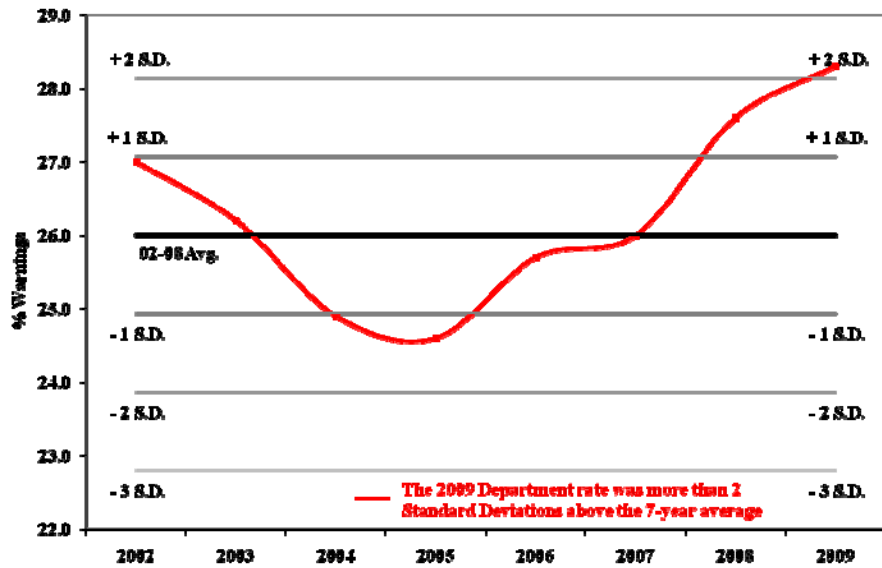
Figure 5.1 displays the rate of warnings (i.e., the number of traffic stops resulting in a warning divided by the total number of traffic stops) throughout the department between 2002 and 2009. The 2009 warning rate was more than two standard deviations above the seven-year average. The rates of warnings issued have been steadily increasing since 2005, reaching a high of 28.3% in 2009.

The citation rate (i.e., the number of traffic stops resulting in a citation divided by the total number of traffic stops) for the department between 2002 and 2009 is reported in Figure 5.2. The 2009 citation rate was within one standard deviation of the seven-year average. There are two trends evident based on the eight years of data collection. Between 2002 and 2005, there was a steady increase in citation rates, from a low of 83.0% to a high of 88.1% in 2005. Since 2006, the citation rate has been relatively stable, with a slight drop-off in 2009.

Figure 5:3: Percent of Traffic Stops Resulting in <u>Arrest</u> – <u>Department</u>

Figure 5:4: Percent of Traffic Stops Resulting in <u>Searches</u> – <u>Department</u>
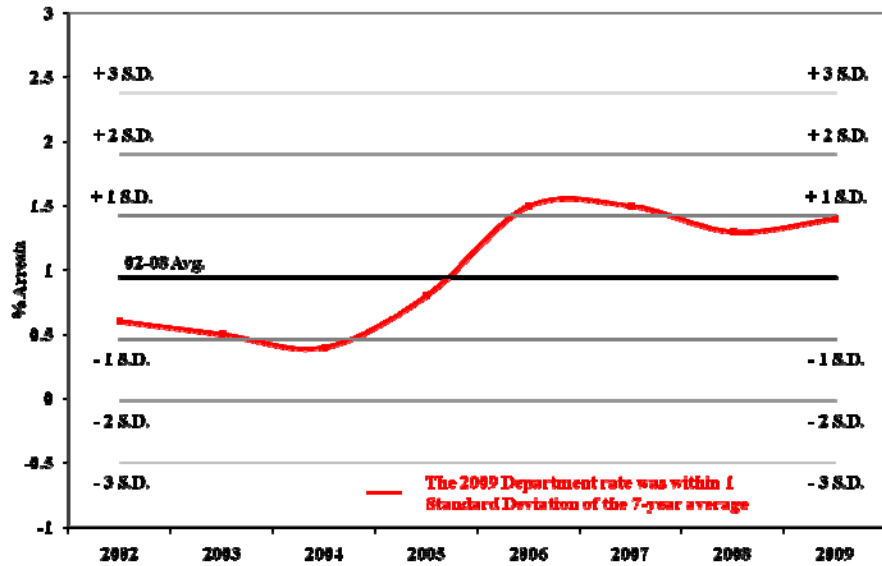
The arrest rate (i.e., the number of traffic stops resulting in arrests divided by the total number of traffic stops) for the department between 2002 and 2009 is summarized in Figure 5.3. The 2009 arrest rate was within one standard deviation of the seven-year average and slightly more than the 2008 rate. The eight-year trend indicates that there was a considerable rise in the arrest rate between 2004 and 2006, but this upswing is at least partially the result of discrepancies in the data collection regarding arrests prior to 2006, as documented in the *2003 - 2004 Final Report*. These data collection limitations were believed to result in an underreporting of arrests prior to 2006. Therefore, it is likely that this reported upswing is simply the result of more accurate reporting since 2006, rather than changes in actual outcomes received by motorists. This is further evidenced by the stability in the arrest rate between 2006 and 2009.

The search rate (i.e., the number of traffic stops resulting in a search divided by the total number of traffic stops) for the department between 2002 and 2009 is reported in Figure 5.4. The 2009 search rate was within one standard deviation of the seven-year average and is identical to the 2008 rate. The eight-year trend indicates relative stability in the past four years after an increase in 2005. Similar to the arrest rate, however, there were some data collection problems prior to 2006, which may have resulted in an underreporting of searches throughout the department. Please refer to the *2003 - 2004 Final Report* for further discussion of these limitations.

Figure 5:5: Percent of Searches Resulting in <u>Seizures</u> – <u>Department</u>
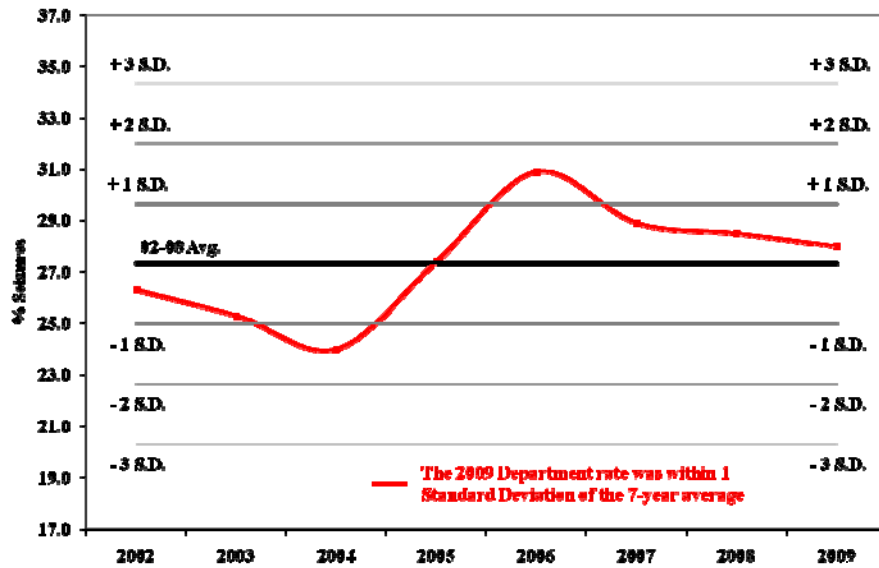
Figure 5.5 displays the seizure rate (i.e., the number of traffic stops resulting in the discovery of contraband divided by the number of traffic stops involving a search) for the department between 2002 and 2009. The 2009 seizure rate was within one standard deviation of the seven-year average and similar to the 2008 seizure rate. Note that the seizure rate includes the discovery of contraband from searches made for any reason. Further examination of *discretionary* searches is conducted in Section 7.

Traffic Stop Outcomes by Race/Ethnicity: 2002-2009

Figures 5.6 – 5.10 display the rate of traffic stop outcomes at the department level between 2002 and 2009 for specific racial/ethnic groups. Due to the small number of traffic stops that occurred for some racial/ethnic groups (e.g., Native Americans, Asians, etc.), the statistics reported below are limited to comparisons of White, Black, and Hispanic drivers. All percentages reported in the following figures were calculated by taking the total number of traffic stop outcomes issued to a specific racial/ethnic group of drivers and dividing it by the total number of traffic stops for that group. In this manner, the percentages reflect only the outcomes that occurred within a specific racial/ethnic group.

Figure 5:6: Percent of Traffic Stops Resulting in <u>Warnings</u> by Race/Ethnicity – Department Wide

Figure 5:7: Percent of Traffic Stops Resulting in <u>Citations</u> by Race/Ethnicity – Department Wide
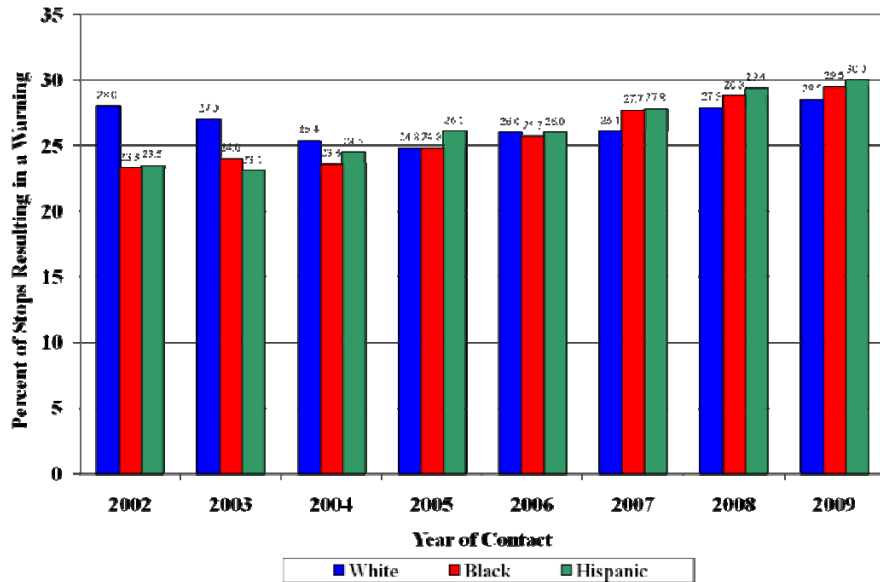
Figure 5.6 displays the department rate of warnings issued to White, Black, and Hispanic drivers between 2002 and 2009. In 2009, the warning rates for Black and Hispanic drivers were slightly higher than the warning rates for White drivers, which mirror the trends in 2007 and 2008. Across the eight years of data collection, the warning rate for White drivers decreased between 2002 and 2005, but increased slightly in the last four years. The warning rates for Black and Hispanic drivers have increased in the past three years. Overall, White drivers had a higher warning rate between 2002 and 2004, but this trend has been reversed in the last three years.

The citation rate for White, Black, and Hispanic drivers throughout the department from 2002 to 2009 is reported in Figure 5.7. In 2009, the citation rate for Black and Hispanic drivers was higher than the rate for White drivers. Throughout the eight years of data collection, the citation rates for all groups increased between 2002 and 2004, but have stabilized in the past four years. Hispanic drivers consistently have the highest rate of citations, while White drivers are consistently the least cited group (except 2007).

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Figure 5:8: Percent of Traffic Stops Resulting in <u>Arrests</u> by Race/Ethnicity – Department Wide

Figure 5:9: Percent of Traffic Stops Resulting in <u>Searches</u> by Race/Ethnicity – Department Wide
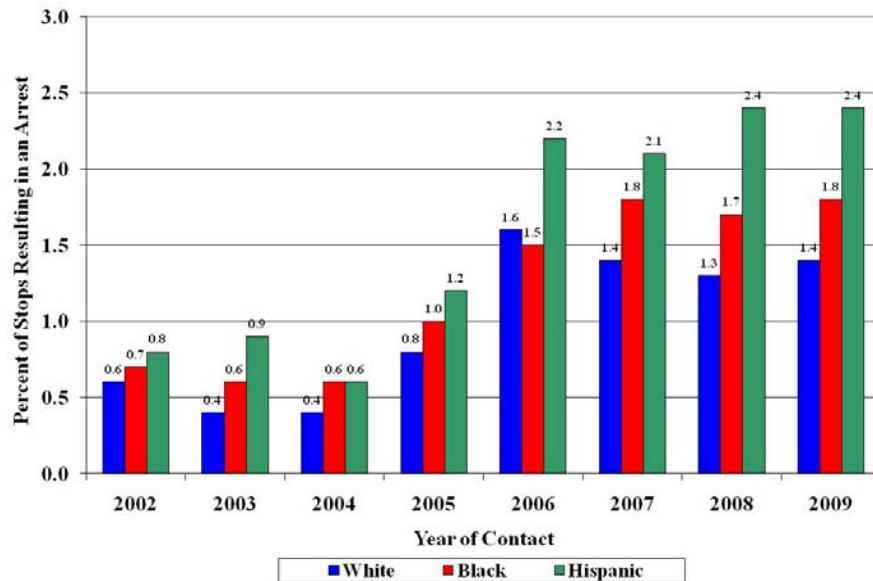
Figure 5.8 displays the arrest rate for White, Black, and Hispanic drivers throughout the department from 2002 to 2009. The overall arrest rates prior to 2006 may have been artificially depressed due to underreporting of arrests in those years. This should not influence the differences across racial/ethnic groups, however. In 2009, the arrest rate was highest for Hispanic drivers, followed by Black and White drivers, respectively, and the difference between the groups remained similar to the three previous years. In all years, Hispanic drivers are arrested at a higher rate than the other two groups, with White drivers generally being arrested less frequently (except 2006).

The search rate for White, Black, and Hispanic drivers throughout the department from 2002 to 2009 is reported in Figure 5.9. In 2009, the search rate was highest for Black drivers, followed by Hispanic drivers and White drivers. Throughout the eight years of data collection, the search rate of White drivers has been relatively stable, with a slight bump in 2006 and 2007. For Black drivers, the search rate indicates an upward trend between 2002 and 2007, with a slight decrease and stabilization in 2008 and 2009. The search rate for Hispanic drivers also increased in early years of data collection, but has stabilized and decreased since 2005. Note, however, that the dramatic differences across racial/ethnic groups in terms of search rates have persisted across time.

Figure 5:10: Percent of Traffic Stops Resulting in <u>Seizures</u> by Race/Ethnicity – Department Wide
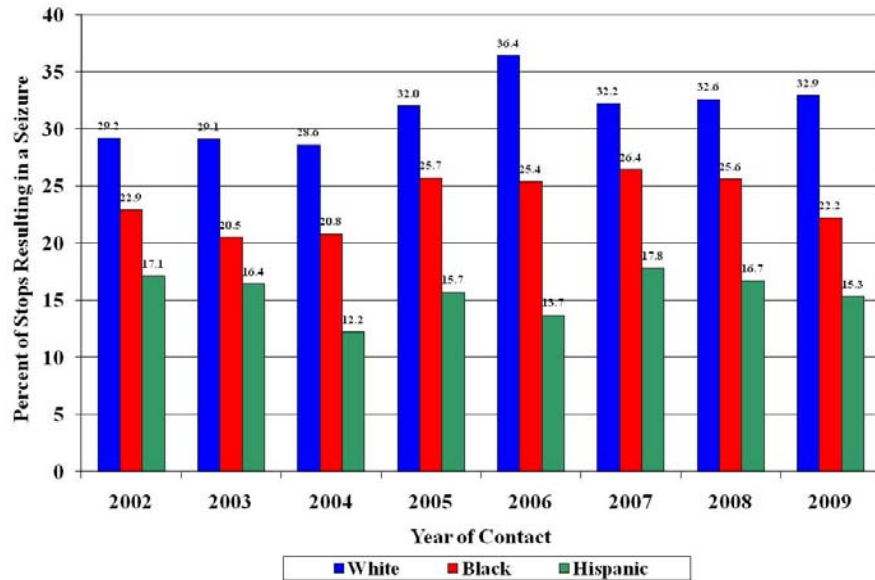
Figure 5.10 documents the seizure rate for White, Black, and Hispanic drivers throughout the department from 2002 to 2009. Again, these seizure rates include discoveries of contraband for searches based on any reason, including mandatory searches. In Section 7, seizure rates based strictly on *discretionary* searches are reported. In 2009, the seizure rate was highest for White drivers, followed by Black drivers and Hispanic drivers, respectively. For White drivers, the 2009 seizure rate mirrors the 2007 and 2008 seizure rates. In 2009, the seizure rate for Black drivers fell slightly compared to the previous four years, and the seizure rate for Hispanic drivers also fell slightly in 2009 compared to 2008. Of note, in all eight years of data collection, White drivers are consistently found with contraband at higher rates than either Black or Hispanic drivers.

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2002-2009 Temporal Trends - Troops

Figures 5.11 – 5.74 report the eight-year trend of warnings, citations, arrests, and searches for all drivers (black line), White drivers (red line), and non-White (blue line) drivers. Black, Hispanic, and "other" drivers are collapsed into a non-White category for comparisons due to the small number of minorities stopped in some troops. No trends are provided for seizure rates in these troops as some units had low rates of searches, thereby causing instability in the rates. The standard deviation methodology was not used in analyses of the troop trends due to potential instability in the results.[8] These graphs are also presented without accompanying text due to the ease of interpretation of these graphs coupled with space considerations.

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[8] Standard deviational analyses are available upon request for any of these troops.

Figure 5:11: Percent of Traffic Stops Resulting in <u>Warnings</u> – Troop J
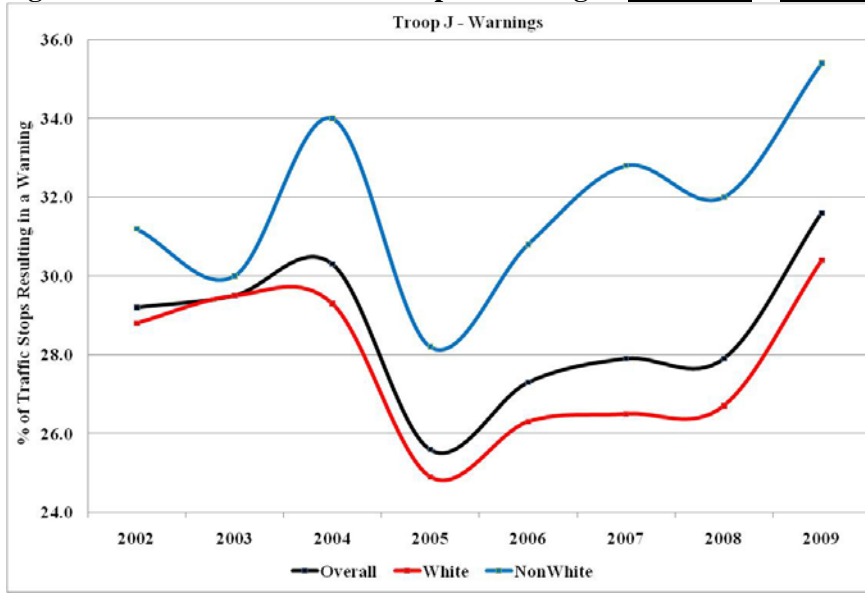
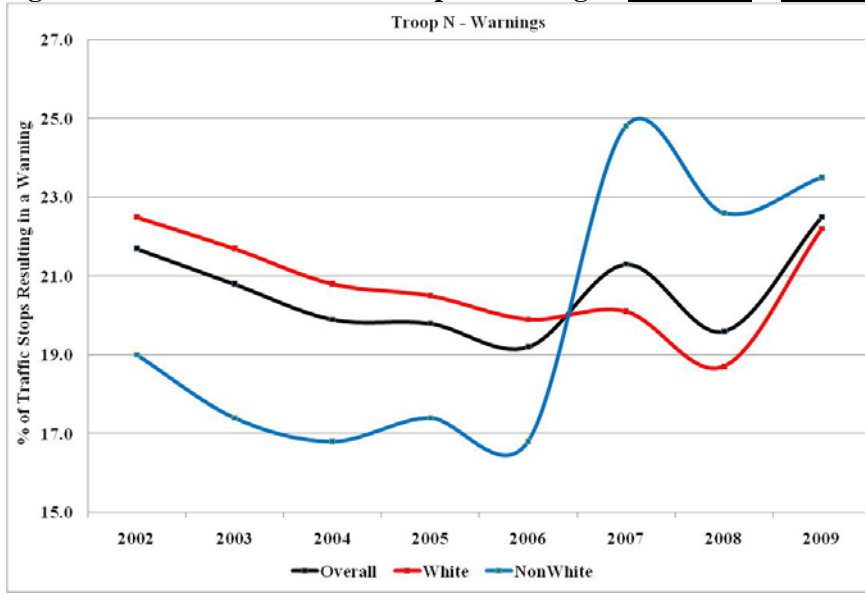**Figure 5:13: Percent of Traffic Stops Resulting in <u>Arrests</u> – Troop J**
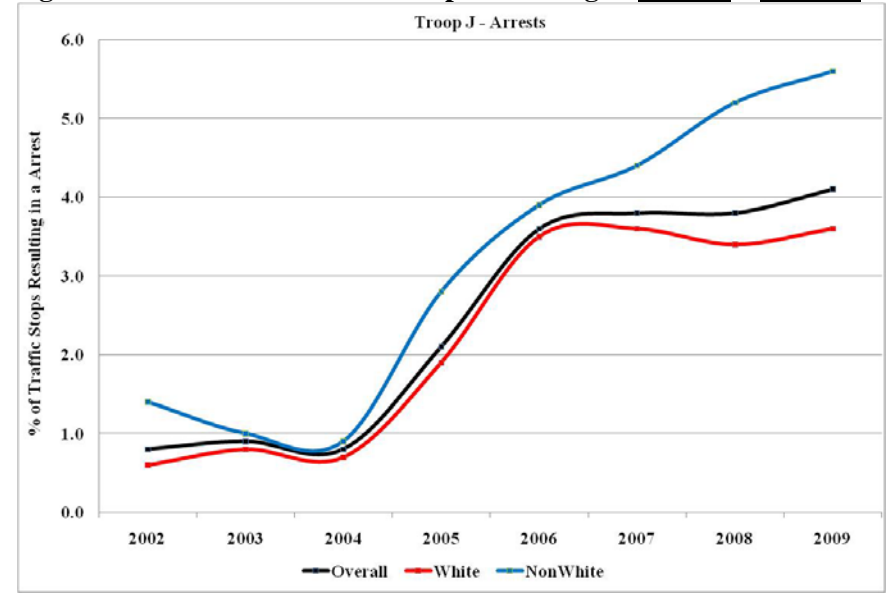
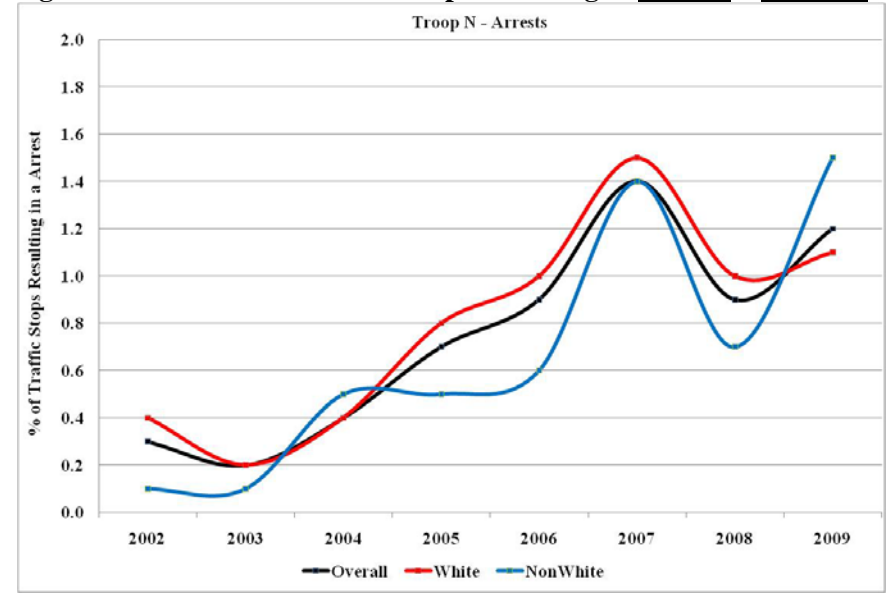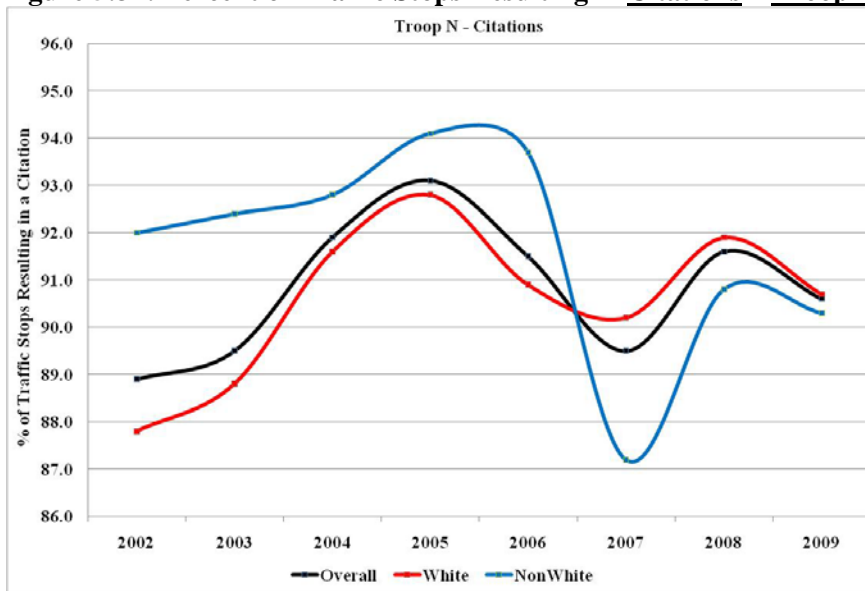**Figure 5:12: Percent of Traffic Stops Resulting in <u>Citations</u> – Troop J**
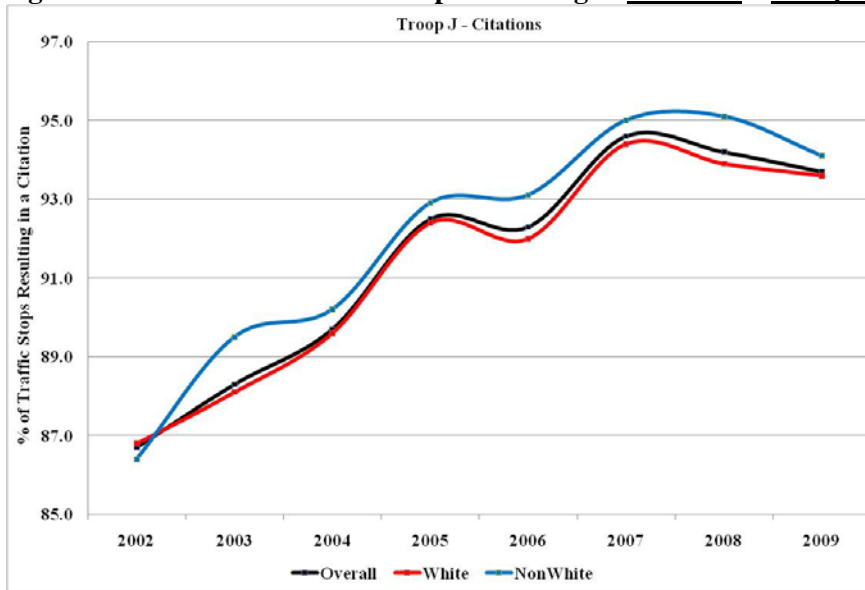
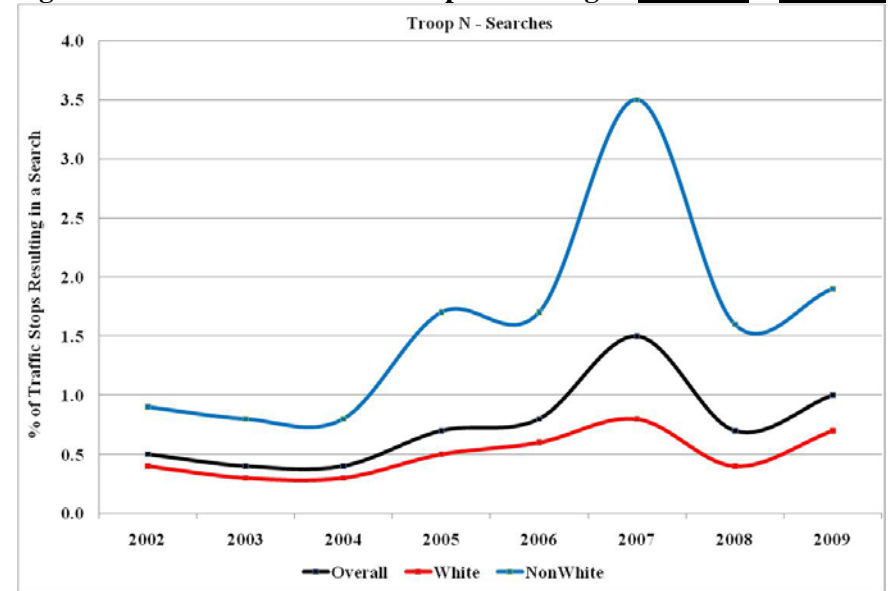**Figure 5:14: Percent of Traffic Stops Resulting in <u>Searches</u> – Troop J**

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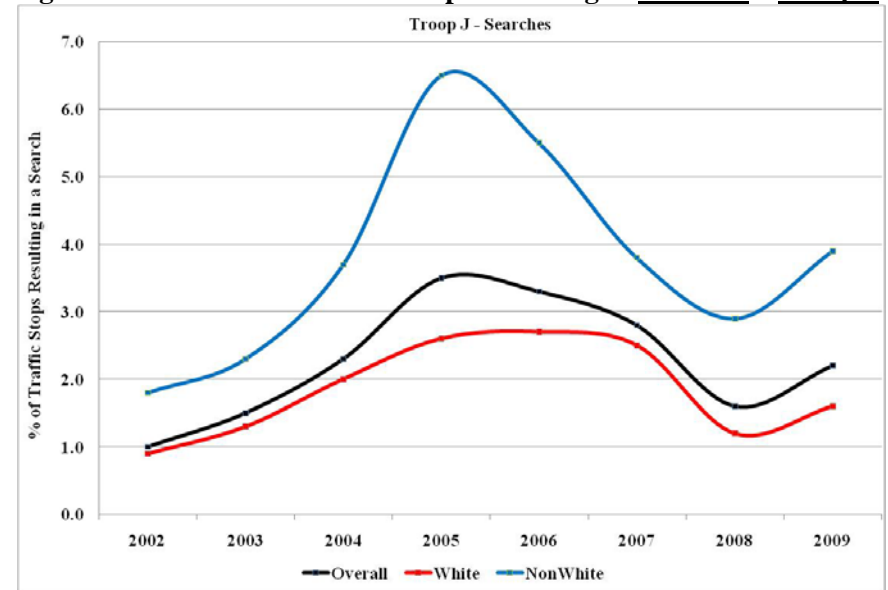
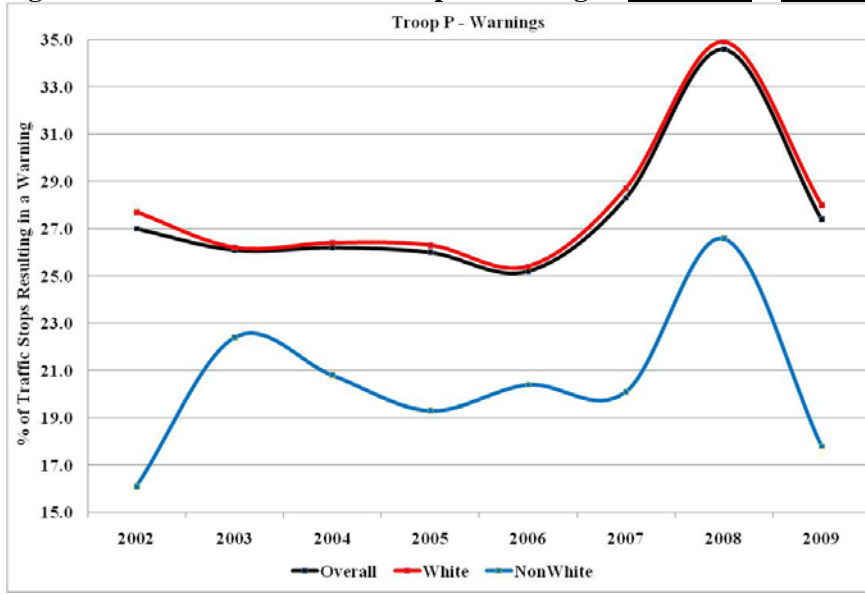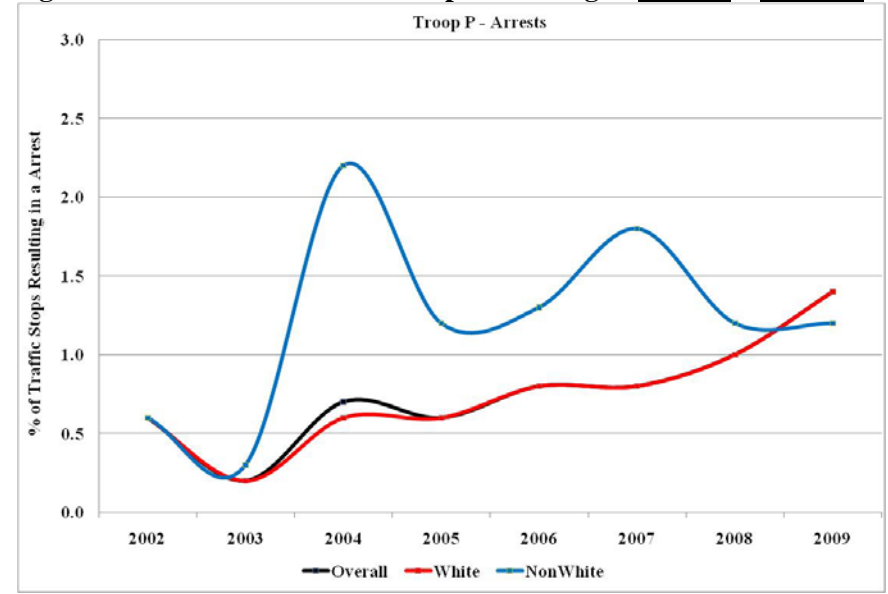**Figure 5:15: Percent of Traffic Stops Resulting in Warnings – Troop K**

Troop K - Warnings
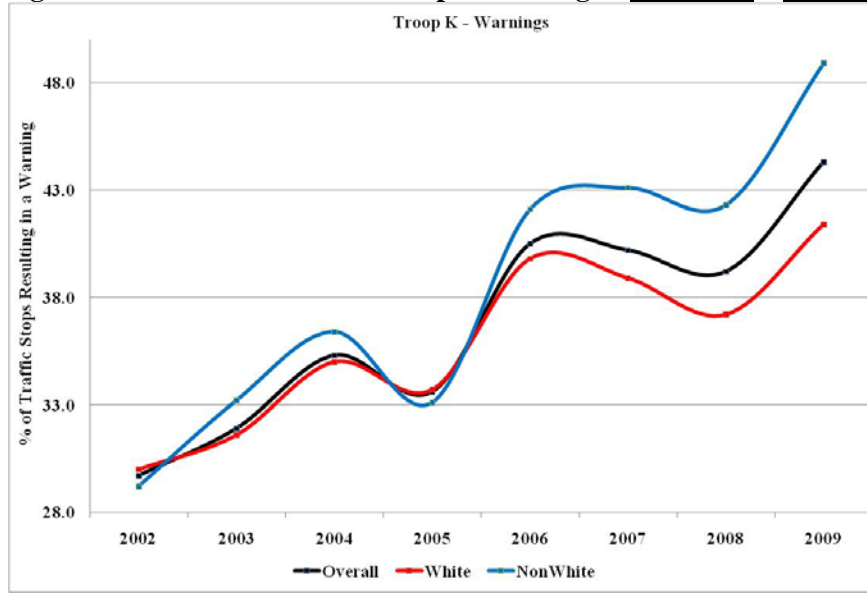
Figure 5:17: Percent of Traffic Stops Resulting in Arrests – Troop K

Troop K - Arrests
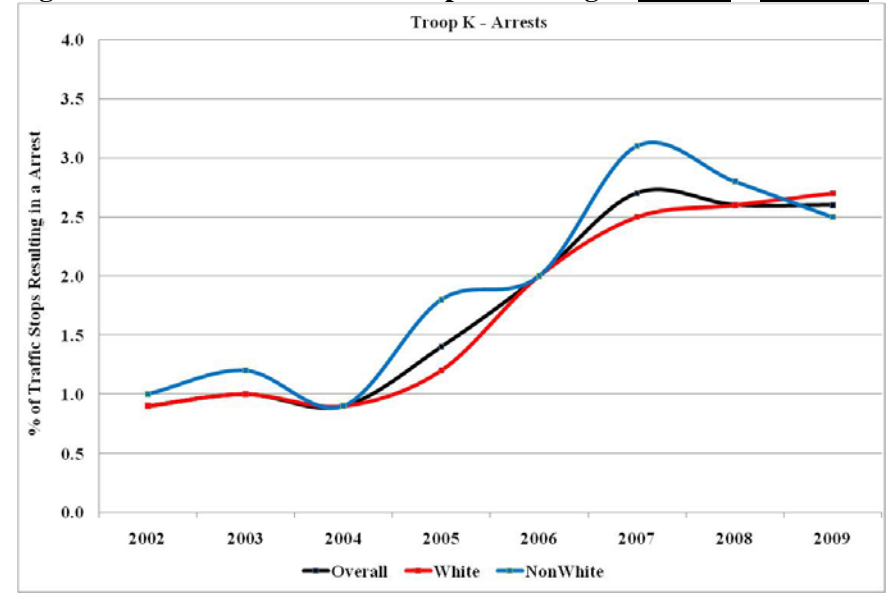
Figure 5:16: Percent of Traffic Stops Resulting in Citations – Troop K

Troop K - Citations
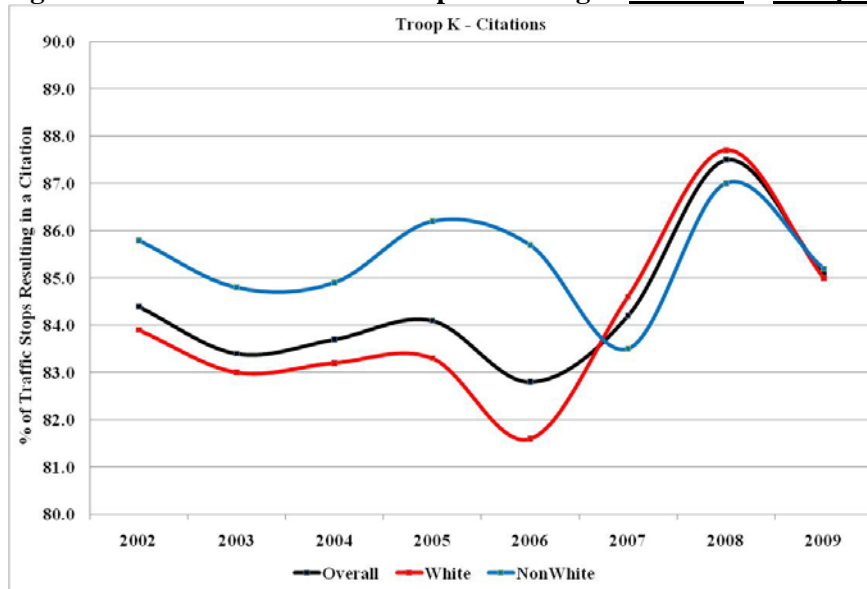
Figure 5:18: Percent of Traffic Stops Resulting in Searches – Troop K

Troop K - Searches

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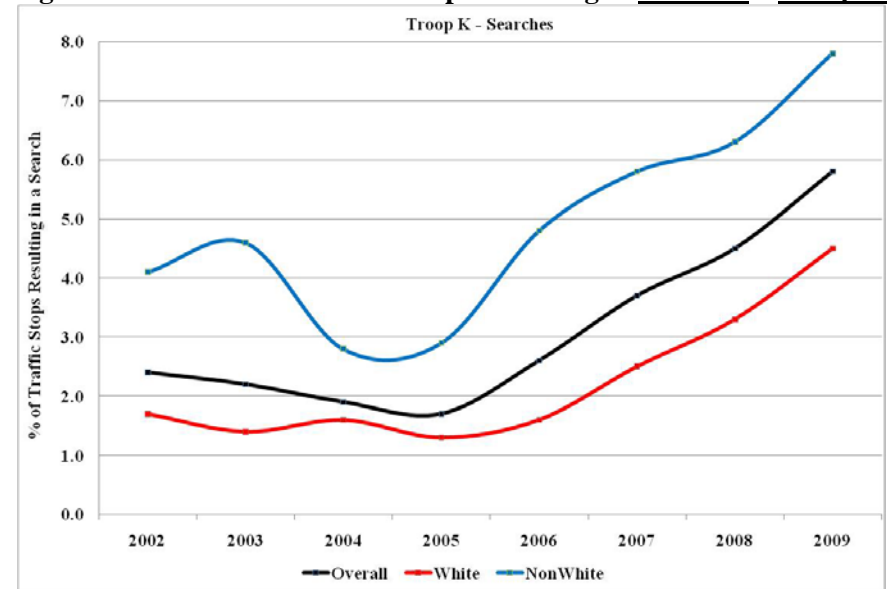
Figure 5:19: Percent of Traffic Stops Resulting in <u>Warnings</u> – <u>Troop L</u>
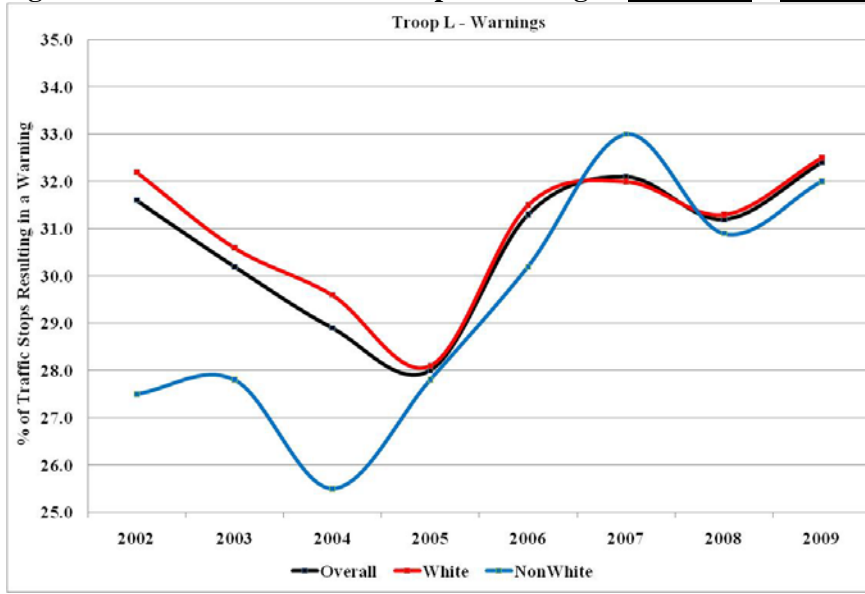
Figure 5:21: Percent of Traffic Stops Resulting in <u>Arrests</u> – <u>Troop L</u>
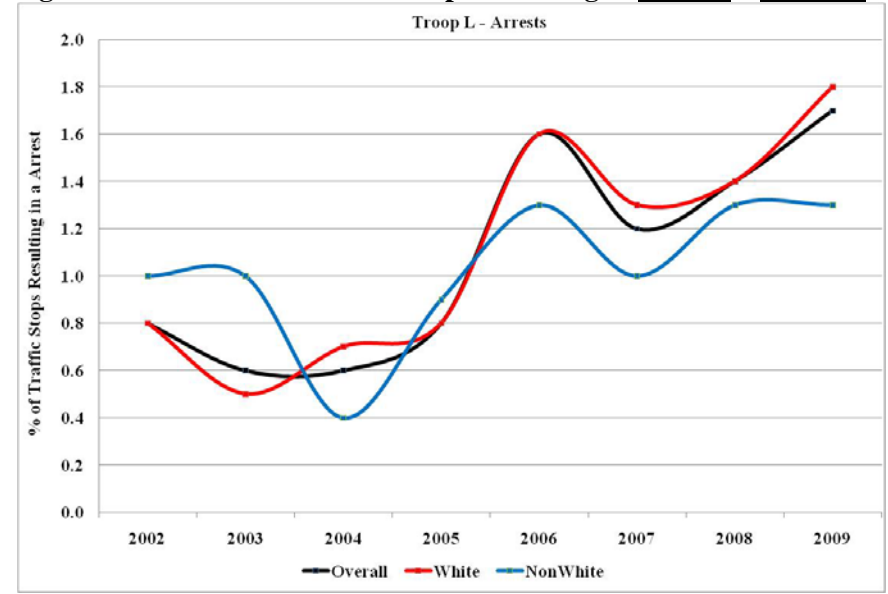
Figure 5:20: Percent of Traffic Stops Resulting in <u>Citations</u> – <u>Troop L</u>
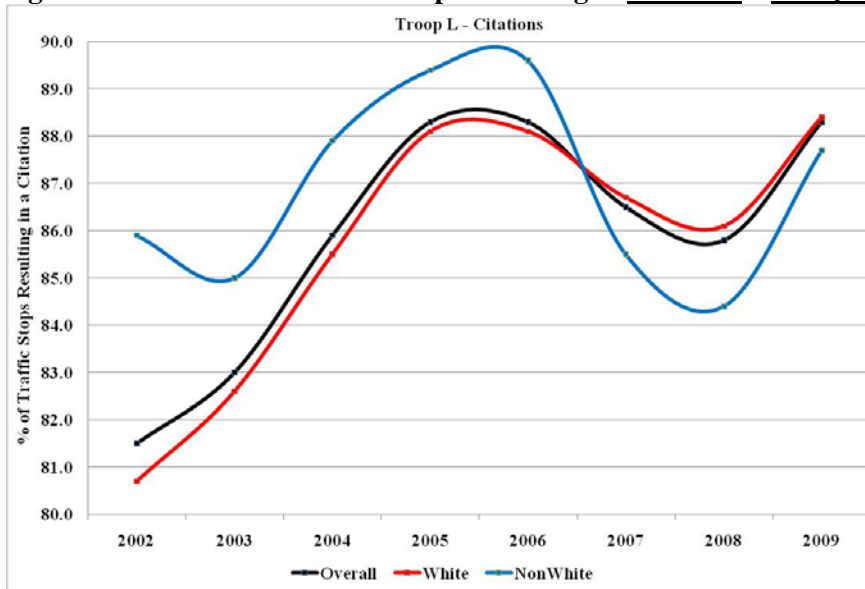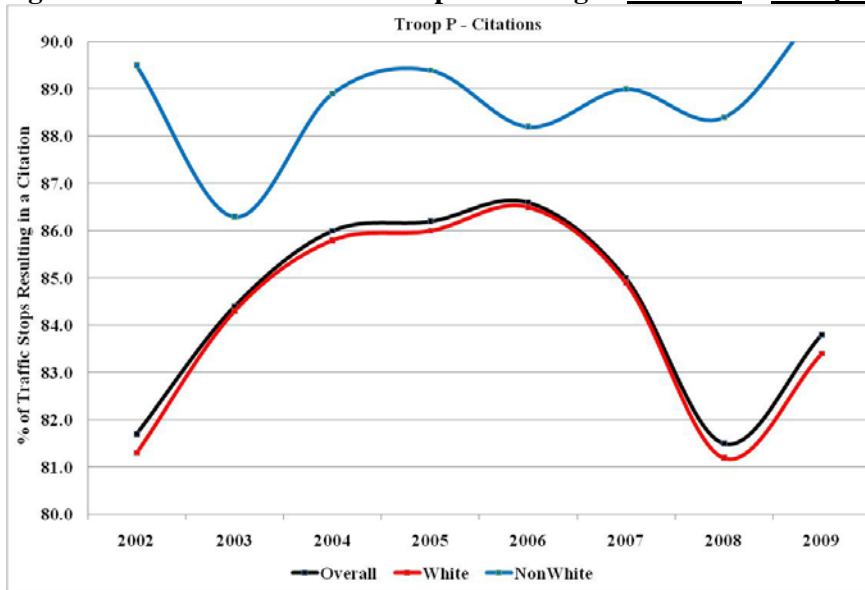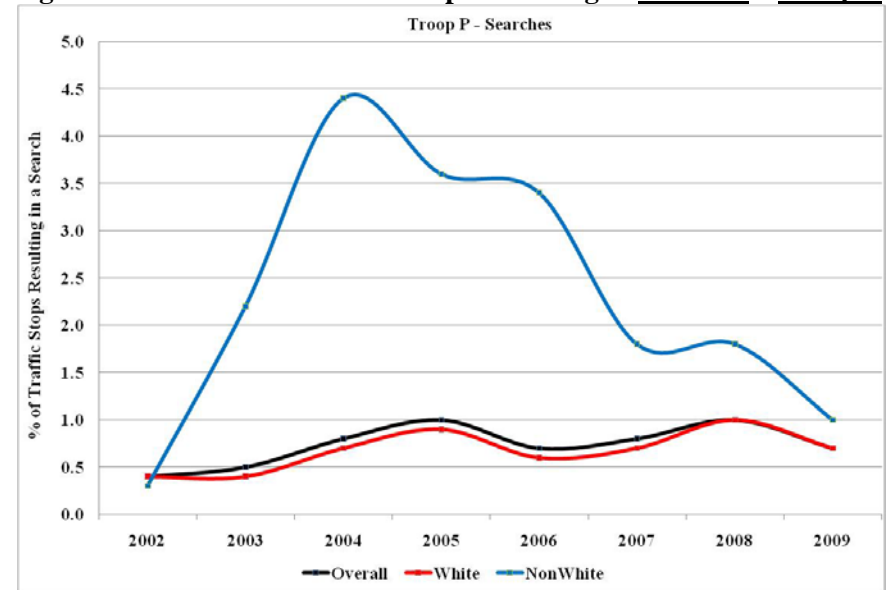

Figure 5:22: Percent of Traffic Stops Resulting in <u>Searches</u> – <u>Troop L</u>

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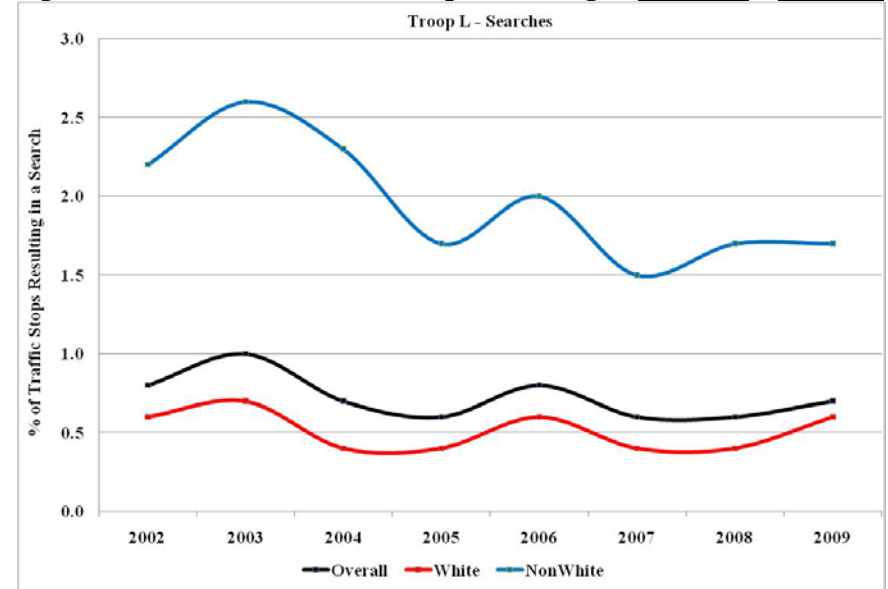
Figure 5:23: Percent of Traffic Stops Resulting in <u>Warnings</u> – <u>Troop M</u>
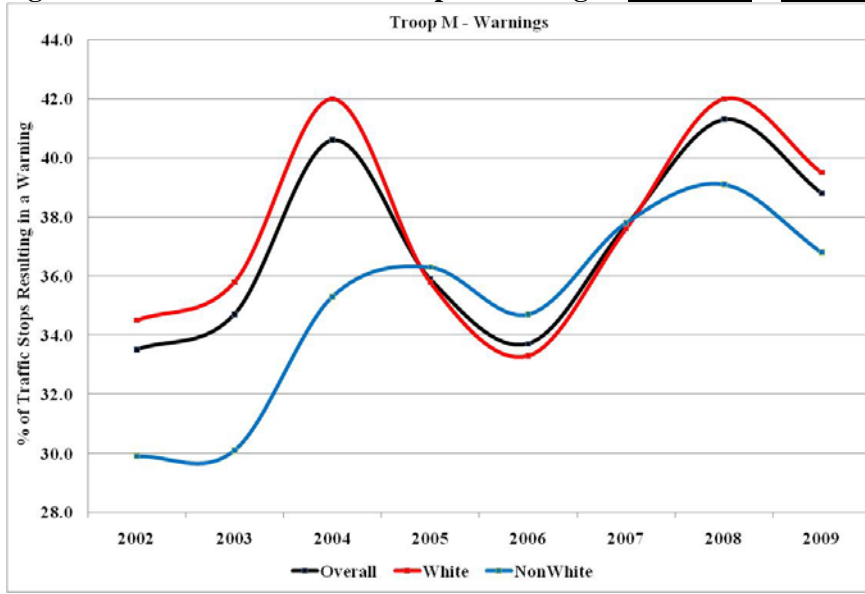
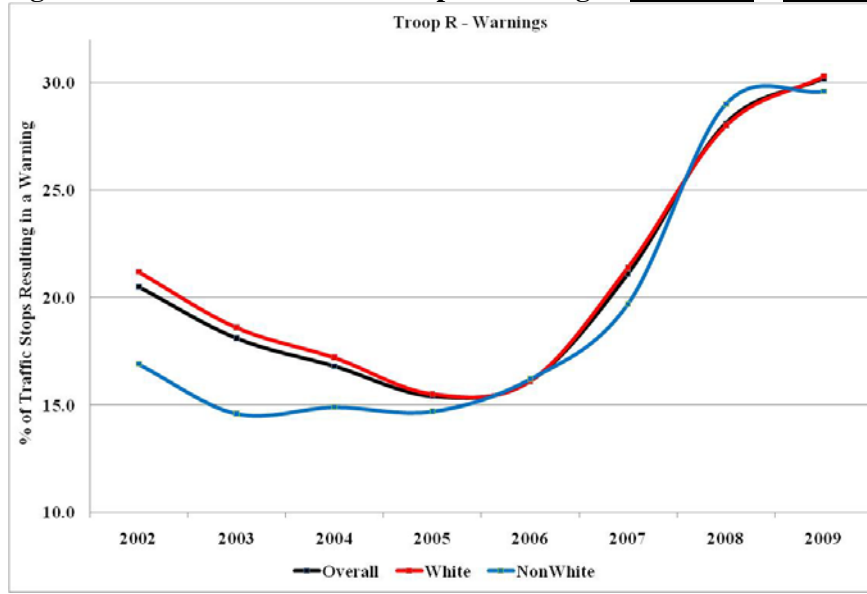**Figure 5:25: Percent of Traffic Stops Resulting in <u>Arrests</u> – <u>Troop M</u>**
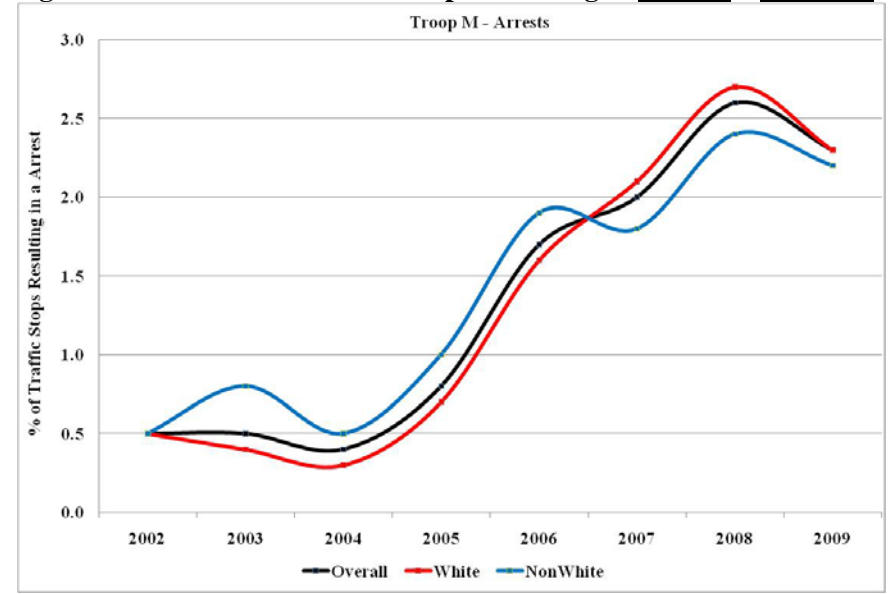
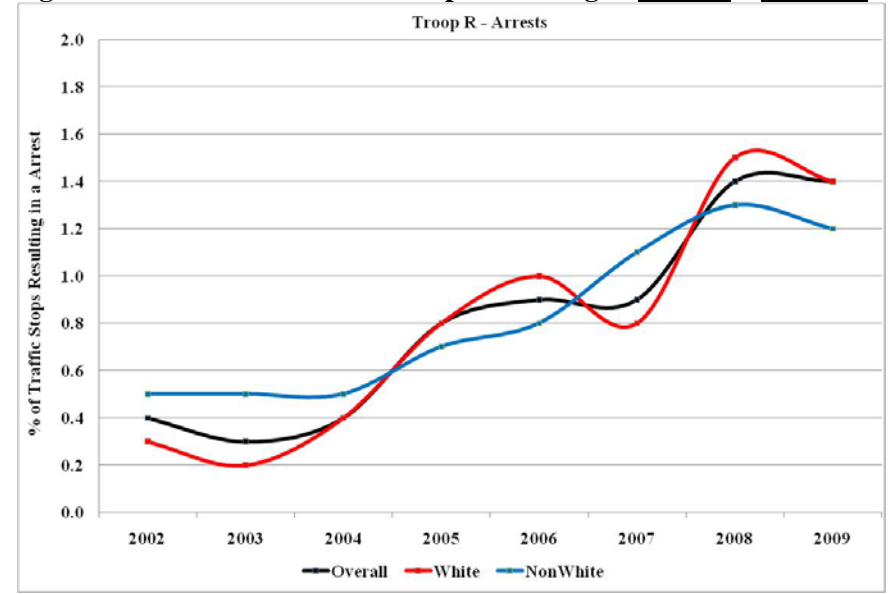**Figure 5:24: Percent of Traffic Stops Resulting in <u>Citations</u> – <u>Troop M</u>**
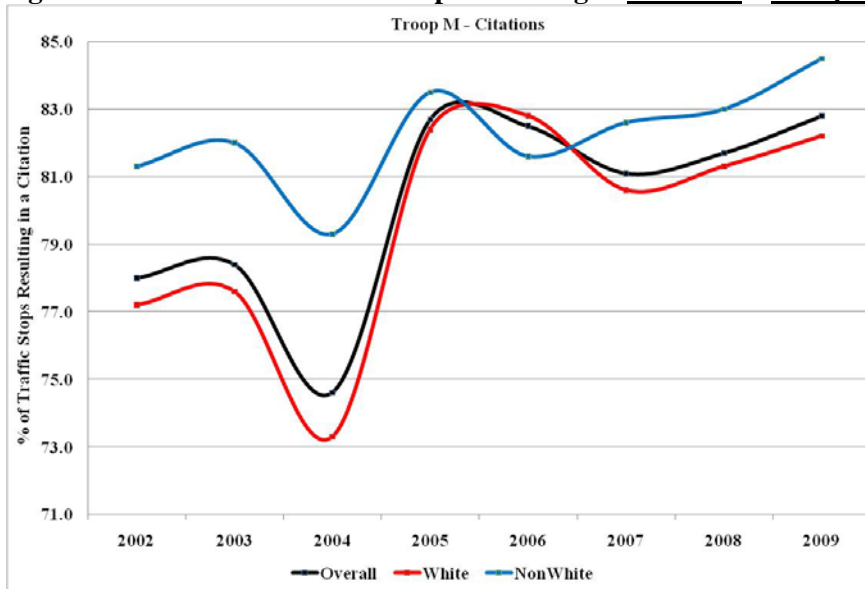
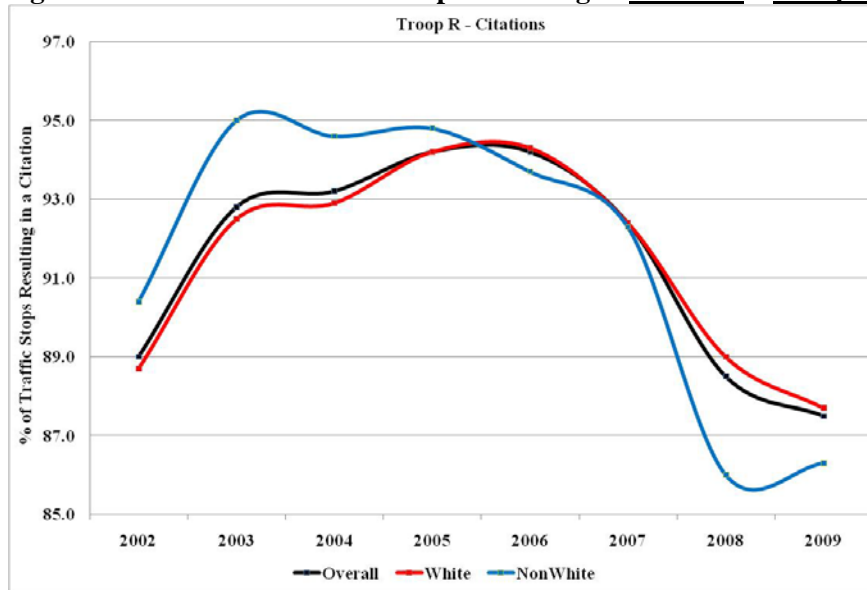**Figure 5:26: Percent of Traffic Stops Resulting in <u>Searches</u> – <u>Troop M</u>**

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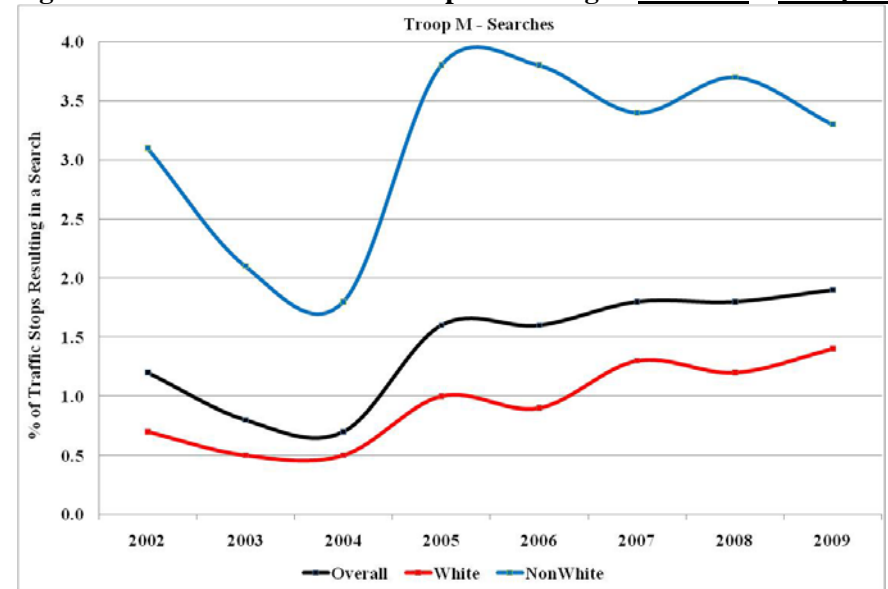
Figure 5:27: Percent of Traffic Stops Resulting in <u>Warnings</u> – <u>Troop F</u>
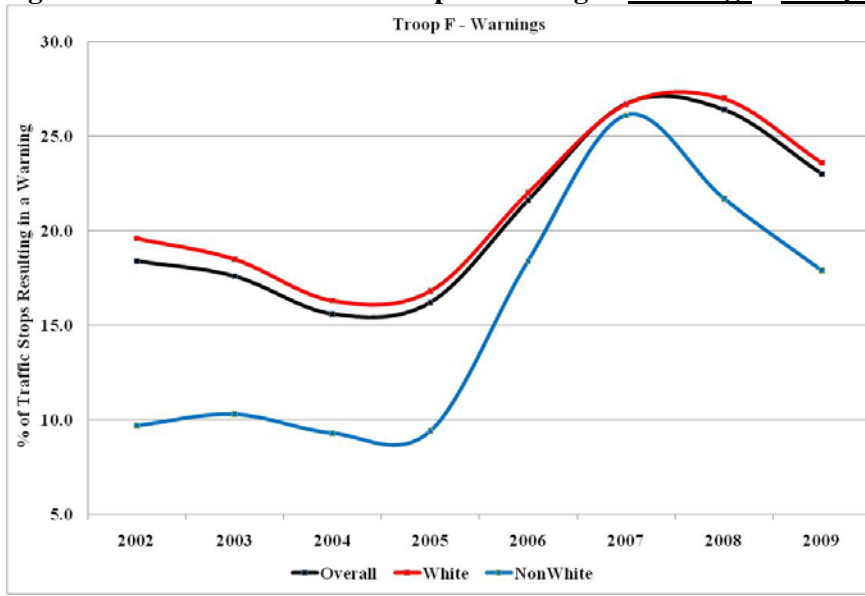
Figure 5:29: Percent of Traffic Stops Resulting in <u>Arrests</u> – <u>Troop F</u>
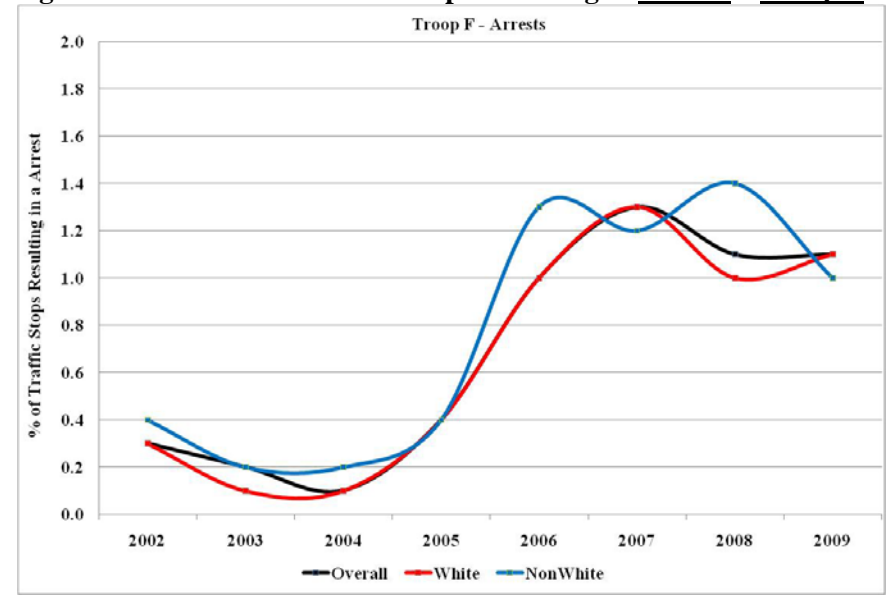
Figure 5:28: Percent of Traffic Stops Resulting in <u>Citations</u> – <u>Troop F</u>
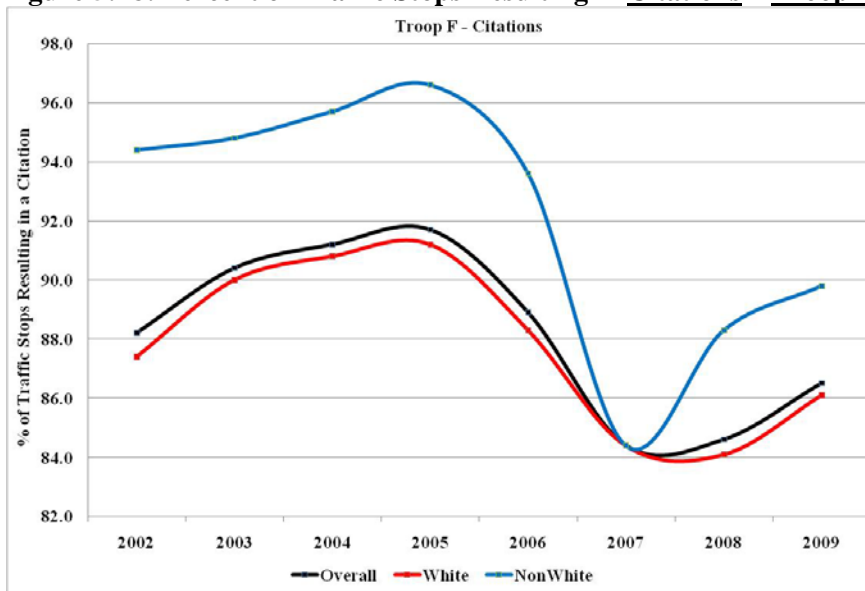
Figure 5:30: Percent of Traffic Stops Resulting in <u>Searches</u> – <u>Troop F</u>

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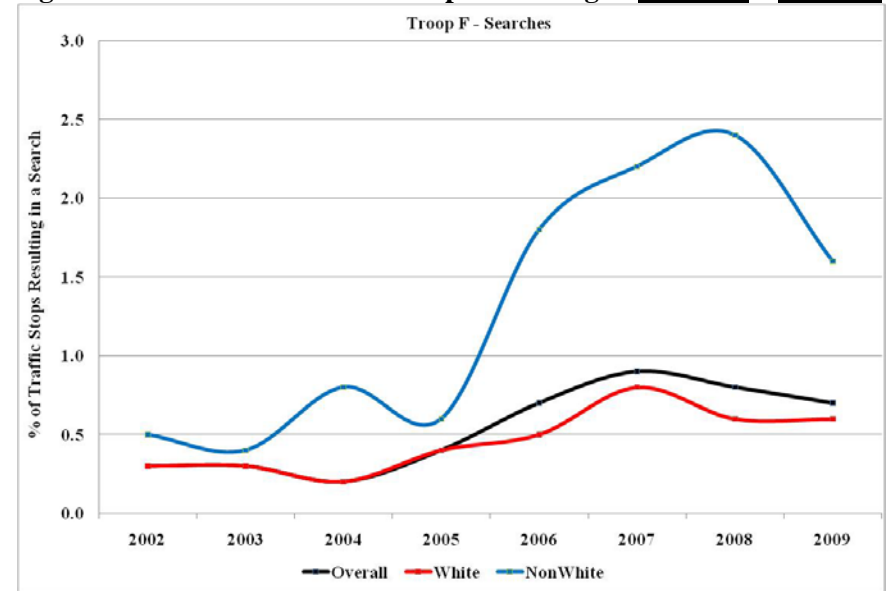
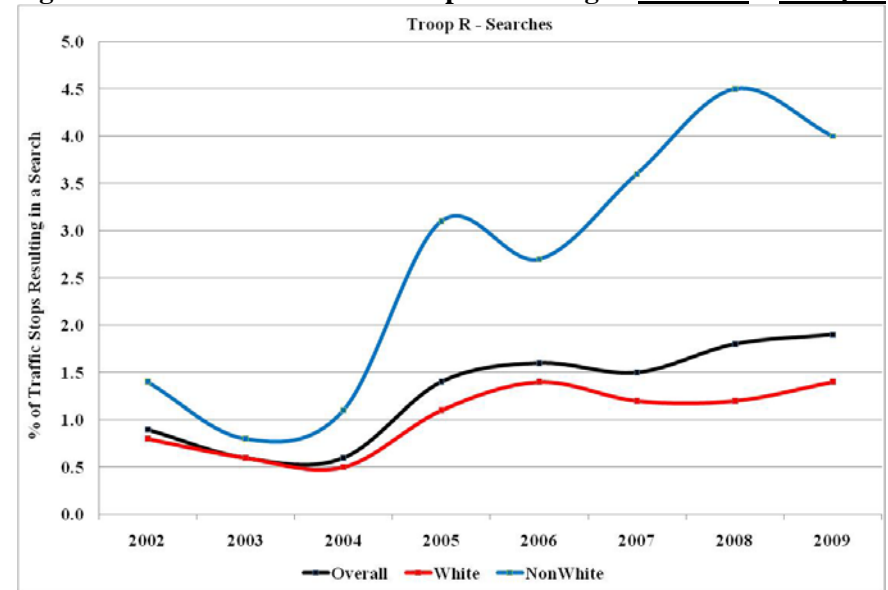**Figure 5:31: Percent of Traffic Stops Resulting in <u>Warnings</u> – <u>Troop N</u>**

Figure 5:33: Percent of Traffic Stops Resulting in <u>Arrests</u> – <u>Troop N</u>

Figure 5:32: Percent of Traffic Stops Resulting in <u>Citations</u> – <u>Troop N</u>

Figure 5:34: Percent of Traffic Stops Resulting in <u>Searches</u> – <u>Troop N</u>

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Figure 5:35: Percent of Traffic Stops Resulting in <u>Warnings</u> – <u>Troop P</u>
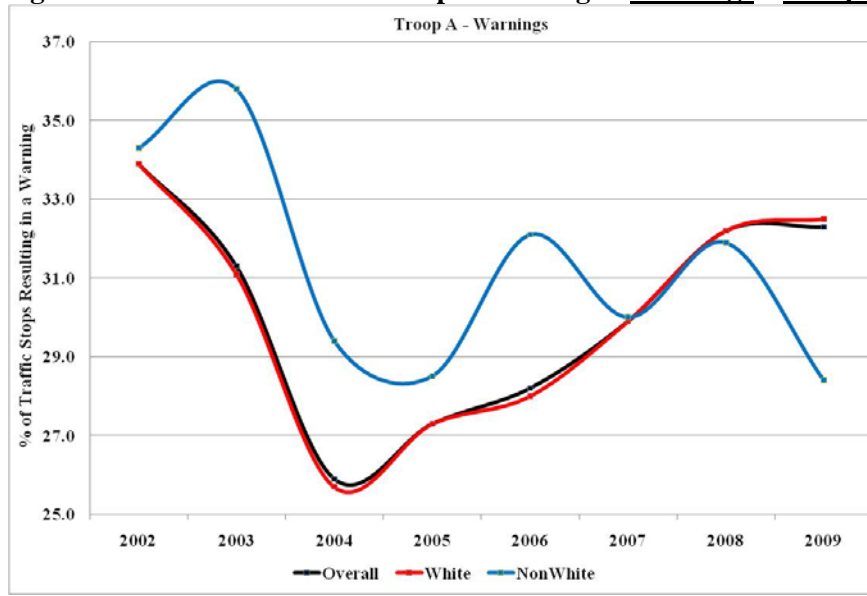

Figure 5:37: Percent of Traffic Stops Resulting in <u>Arrests</u> – <u>Troop P</u>

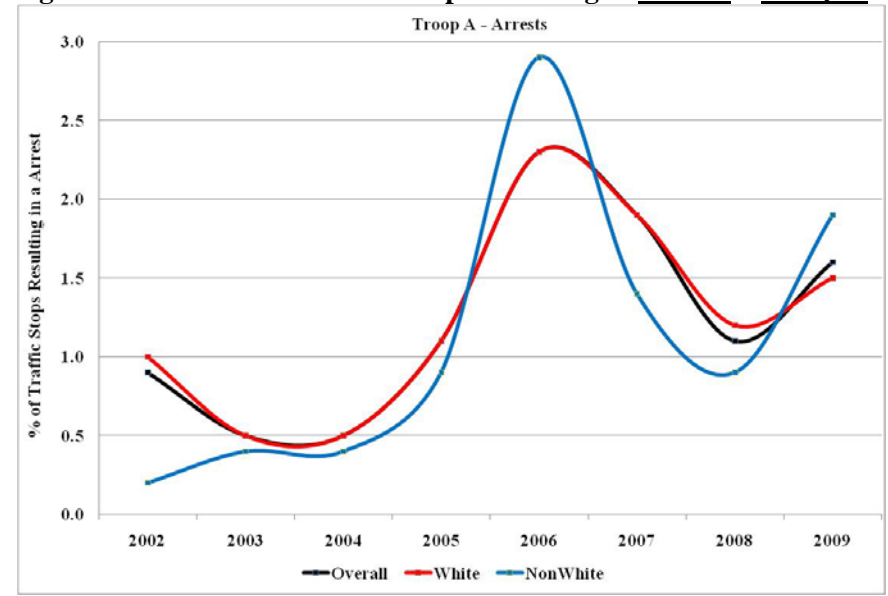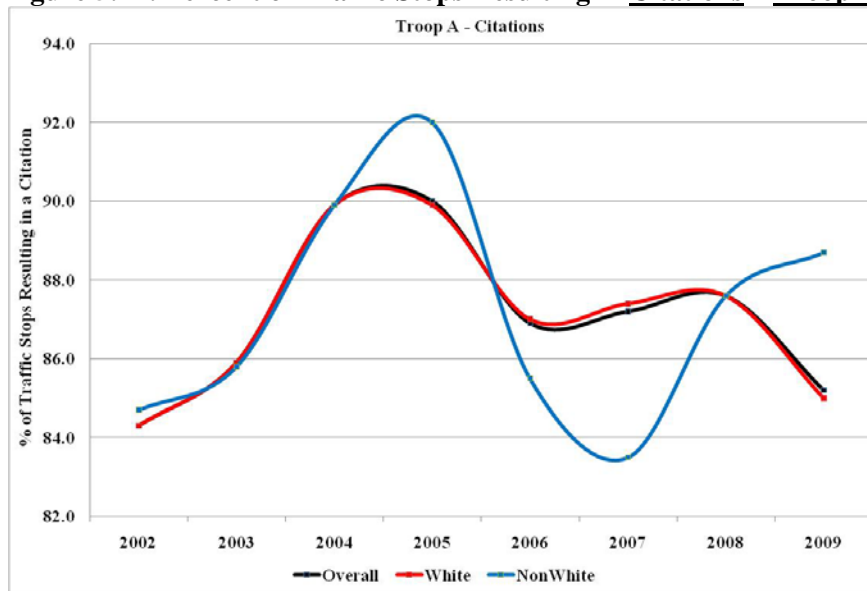**Figure 5:36: Percent of Traffic Stops Resulting in <u>Citations</u> – <u>Troop P</u>**

Figure 5:38: Percent of Traffic Stops Resulting in <u>Searches</u> – <u>Troop P</u>

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Figure 5:39: Percent of Traffic Stops Resulting in Warnings – Troop R

Troop R - Warnings

Figure 5:41: Percent of Traffic Stops Resulting in Arrests – Troop R

Troop R - Arrests

Figure 5:40: Percent of Traffic Stops Resulting in Citations – Troop R

Troop R - Citations

Figure 5:42: Percent of Traffic Stops Resulting in Searches – Troop R
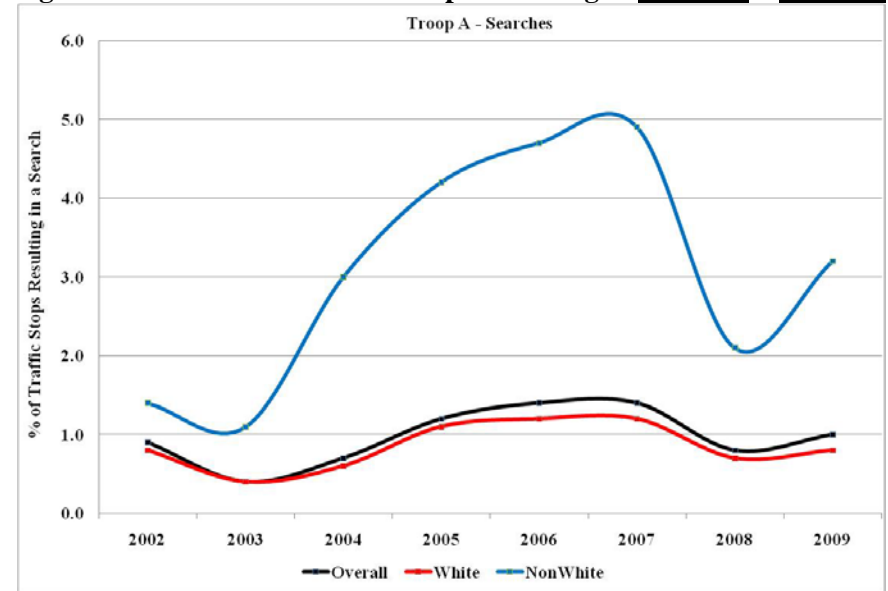

Troop R - Searches

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Figure 5:43: Percent of Traffic Stops Resulting in <u>Warnings</u> – <u>Troop A</u>

Figure 5:45: Percent of Traffic Stops Resulting in <u>Arrests</u> – <u>Troop A</u>

Figure 5:44: Percent of Traffic Stops Resulting in <u>Citations</u> – <u>Troop A</u>

Figure 5:46: Percent of Traffic Stops Resulting in <u>Searches</u> – <u>Troop A</u>

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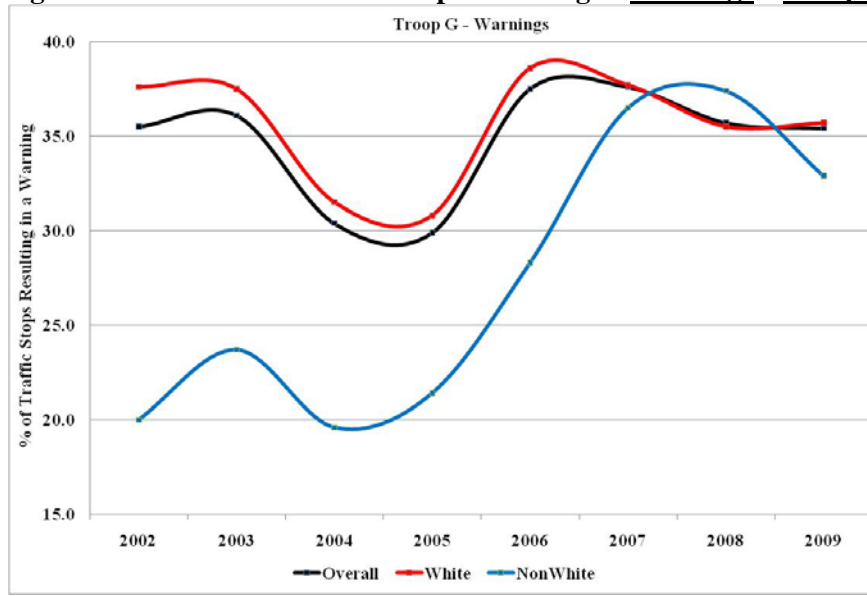**Figure 5:47: Percent of Traffic Stops Resulting in <u>Warnings</u> – Troop G**

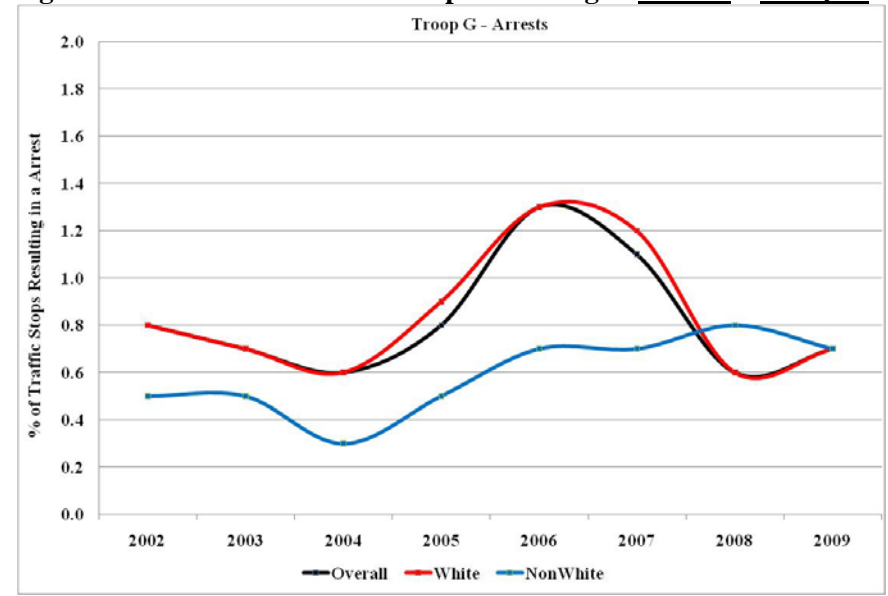**Figure 5:49: Percent of Traffic Stops Resulting in <u>Arrests</u> – Troop G**

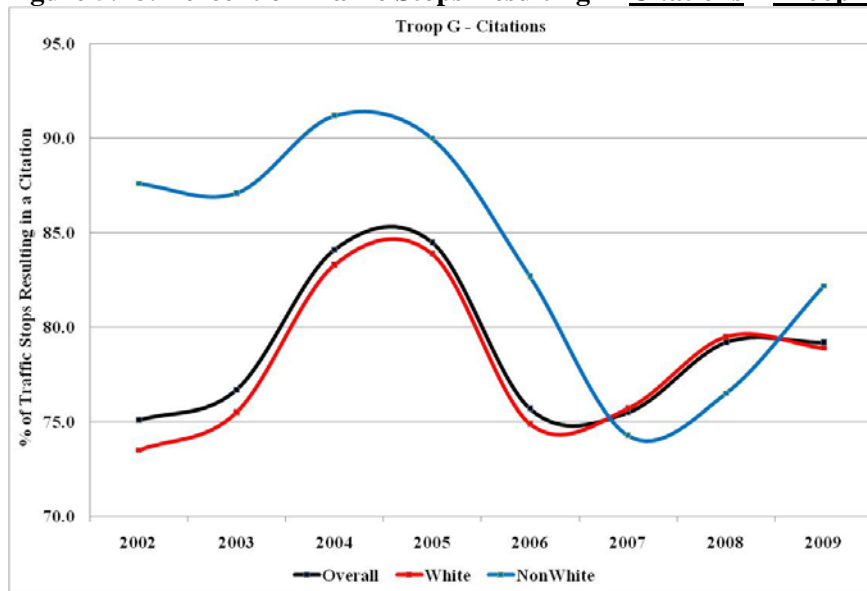**Figure 5:48: Percent of Traffic Stops Resulting in <u>Citations</u> – Troop G**

Figure 5:50: Percent of Traffic Stops Resulting in <u>Searches</u> – Troop G
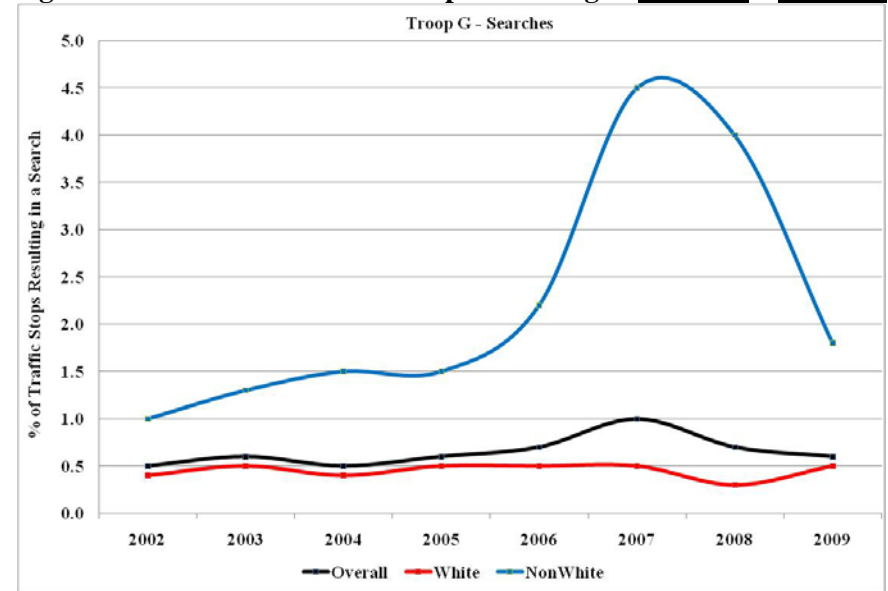

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Figure 5:51: Percent of Traffic Stops Resulting in <u>Warnings</u> – <u>Troop H</u>

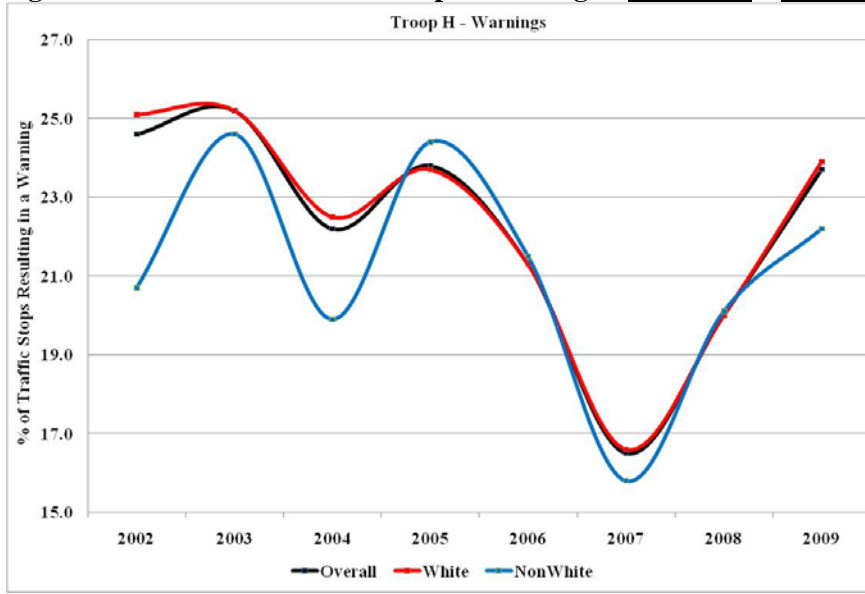**Figure 5:53: Percent of Traffic Stops Resulting in <u>Arrests</u> – <u>Troop H</u>**

Figure 5:52: Percent of Traffic Stops Resulting in <u>Citations</u> – <u>Troop H</u>

Figure 5:54: Percent of Traffic Stops Resulting in <u>Searches</u> – <u>Troop H</u>

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Figure 5:55: Percent of Traffic Stops Resulting in <u>Warnings</u> – <u>Troop C</u>

Figure 5:57: Percent of Traffic Stops Resulting in <u>Arrests</u> – <u>Troop C</u>

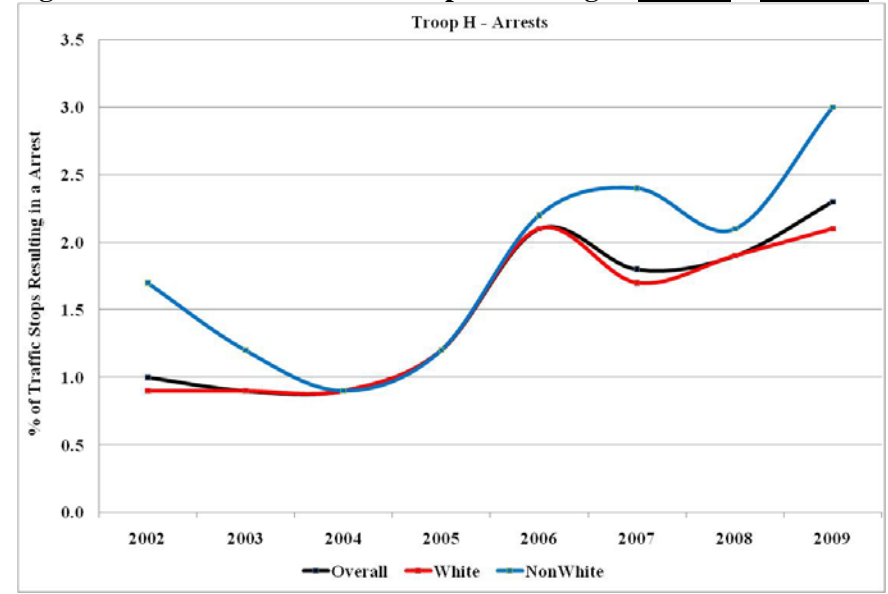**Figure 5:56: Percent of Traffic Stops Resulting in <u>Citations</u> – <u>Troop C</u>**

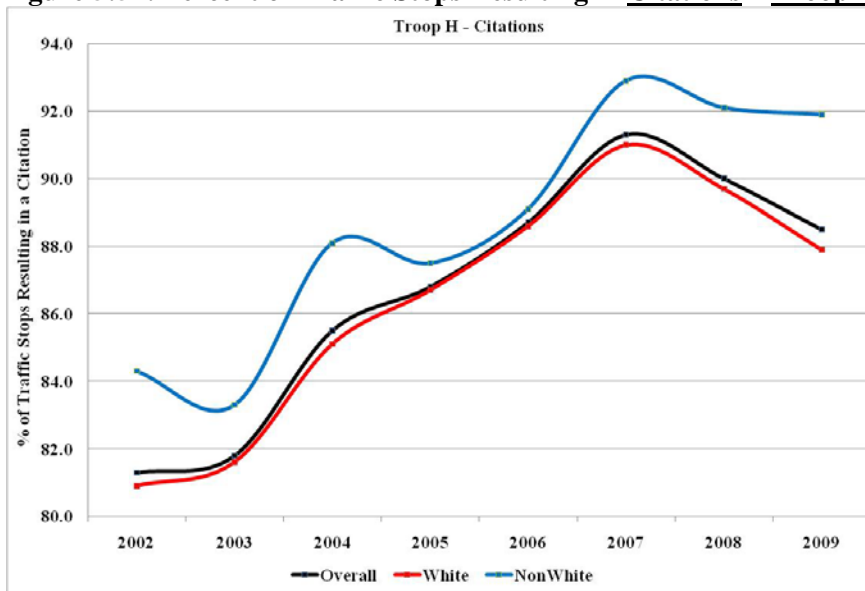**Figure 5:58: Percent of Traffic Stops Resulting in <u>Searches</u> – <u>Troop C</u>**

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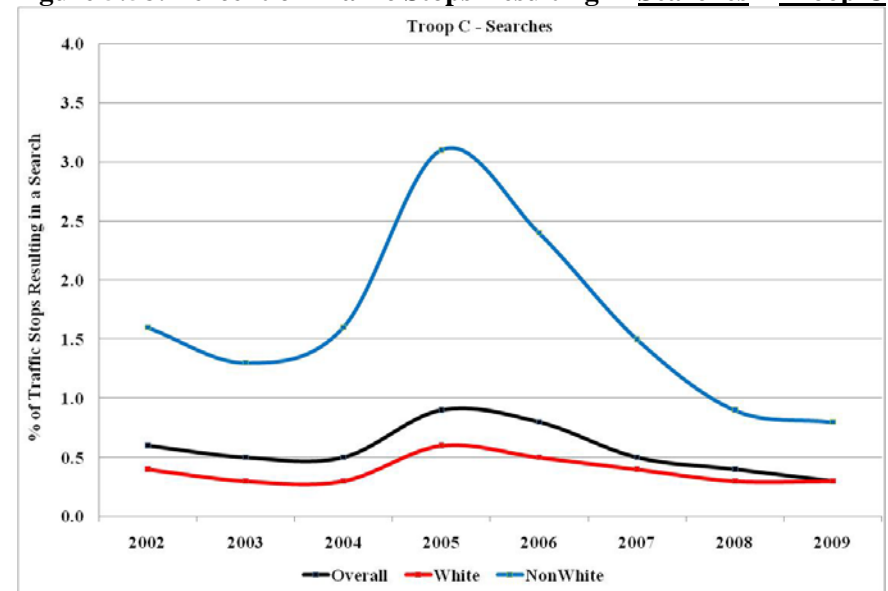
Figure 5:59: Percent of Traffic Stops Resulting in <u>Warnings</u> – Troop D
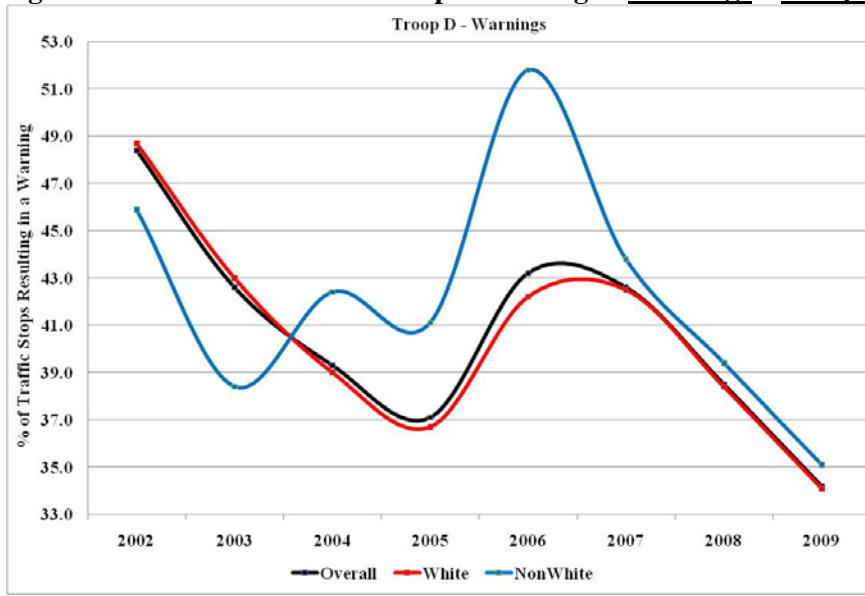
Figure 5:61: Percent of Traffic Stops Resulting in <u>Arrests</u> – Troop D
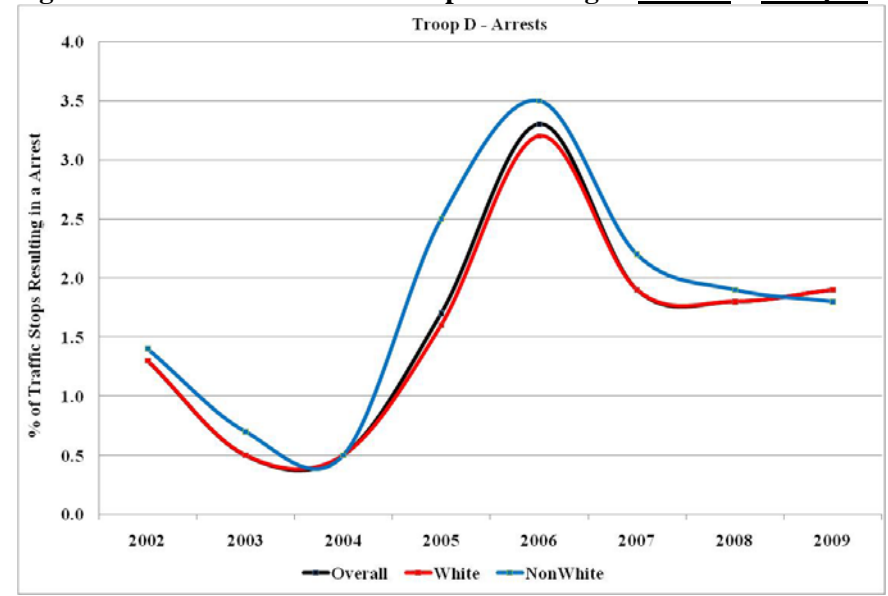
Figure 5:60: Percent of Traffic Stops Resulting in <u>Citations</u> – Troop D
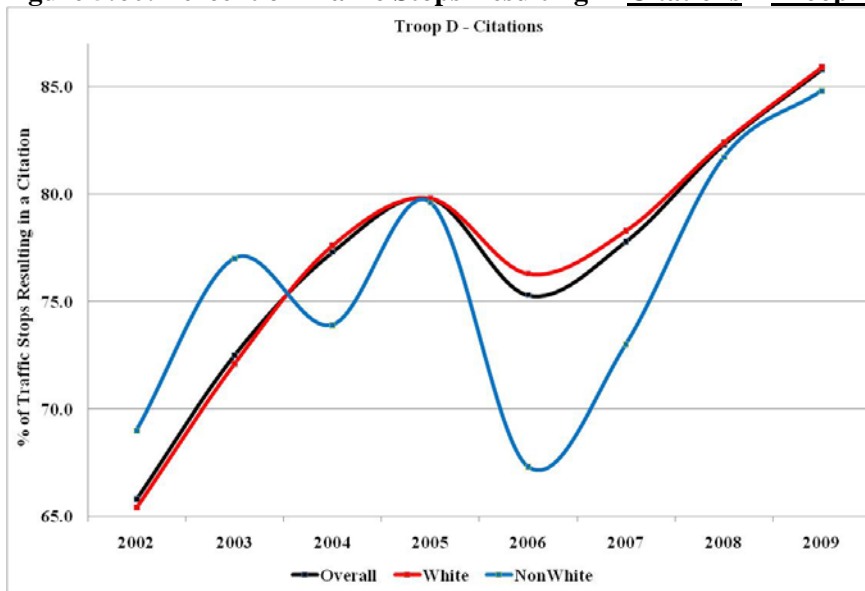
Figure 5:62: Percent of Traffic Stops Resulting in <u>Searches</u> – Troop D
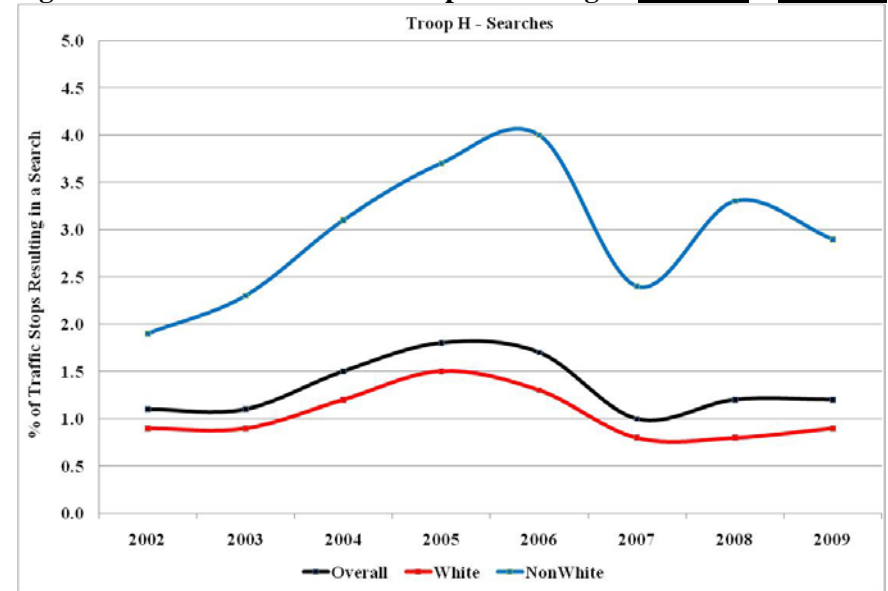

98
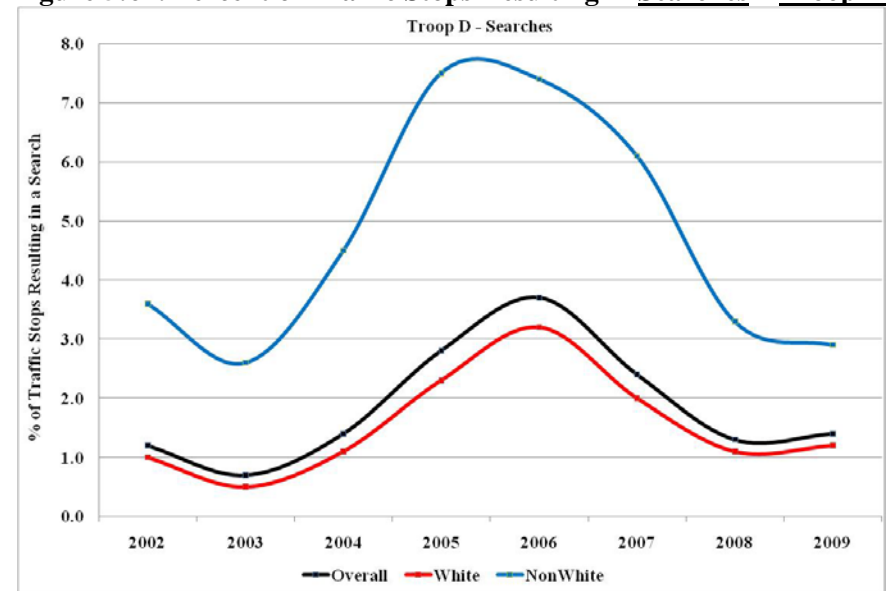
Figure 5:63: Percent of Traffic Stops Resulting in <u>Warnings</u> – <u>Troop E</u>
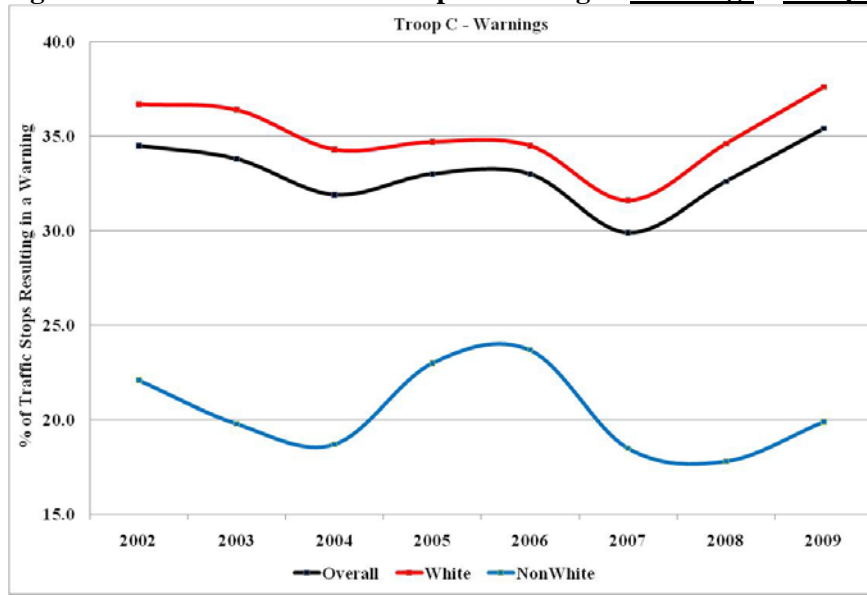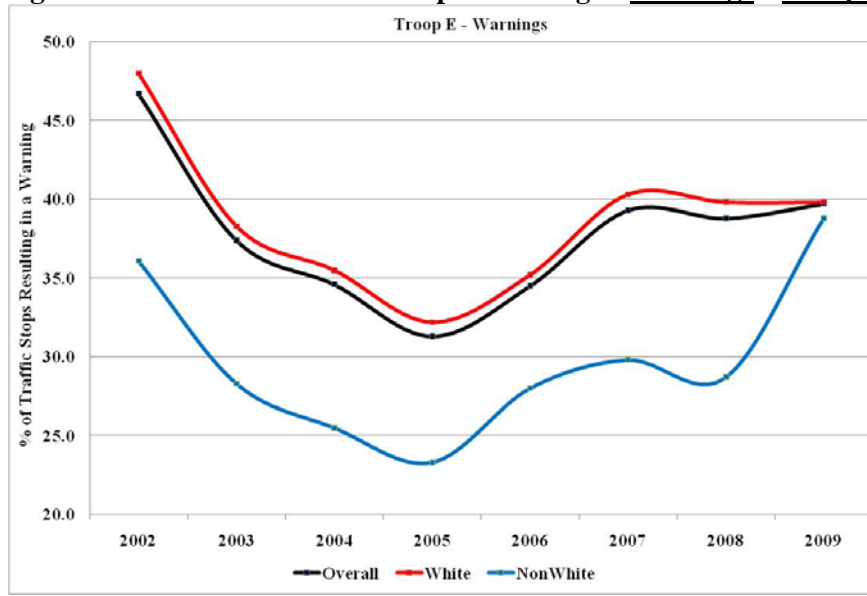

Figure 5:65: Percent of Traffic Stops Resulting in <u>Arrests</u> – <u>Troop E</u>
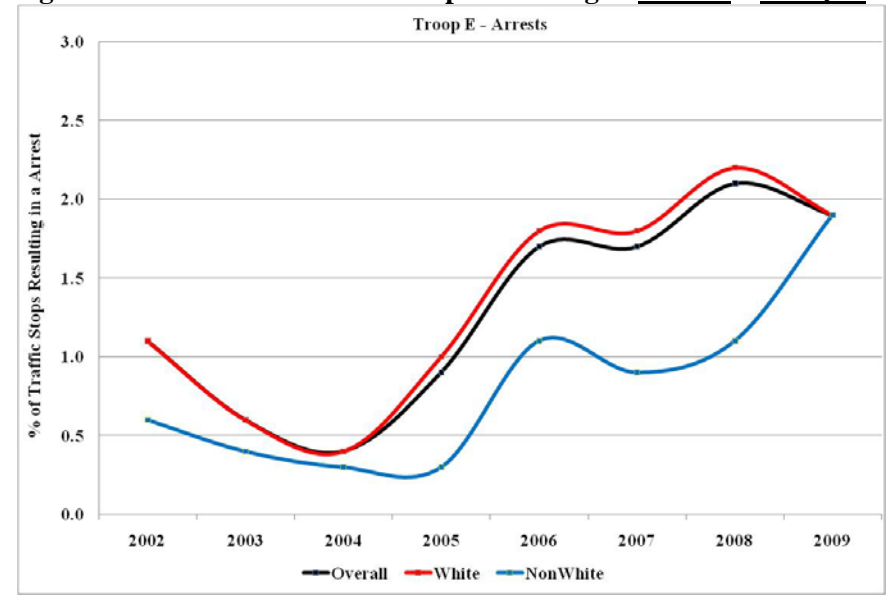
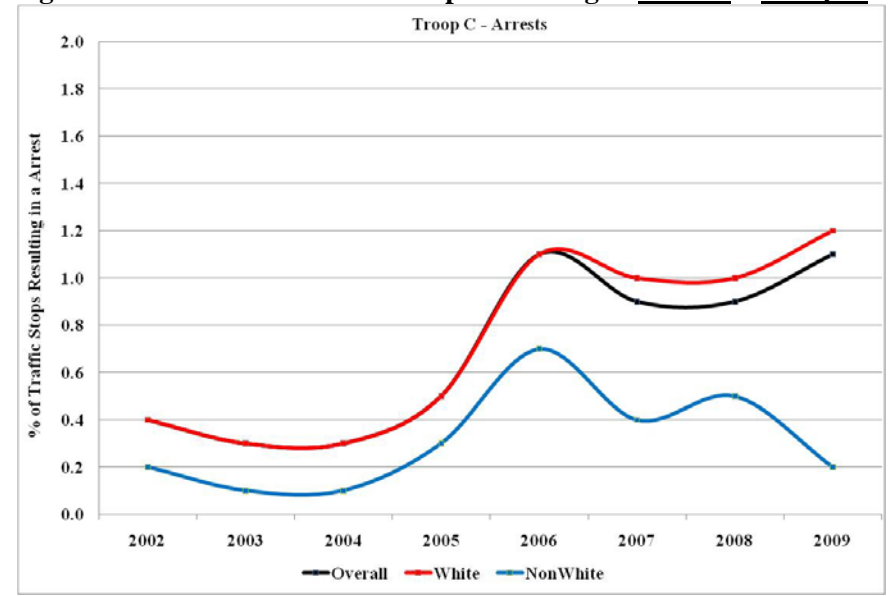**Figure 5:64: Percent of Traffic Stops Resulting in <u>Citations</u> – <u>Troop E</u>**
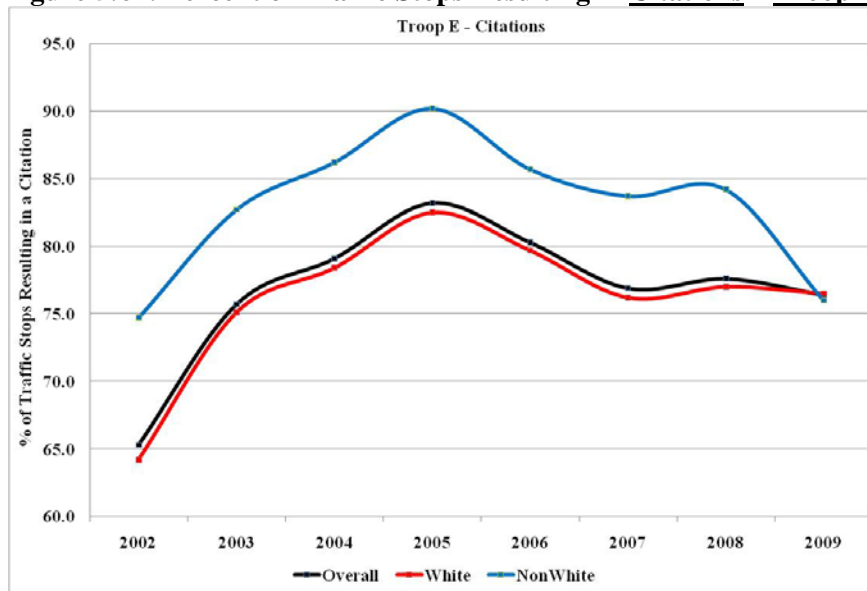
Figure 5:66: Percent of Traffic Stops Resulting in <u>Searches</u> – <u>Troop E</u>

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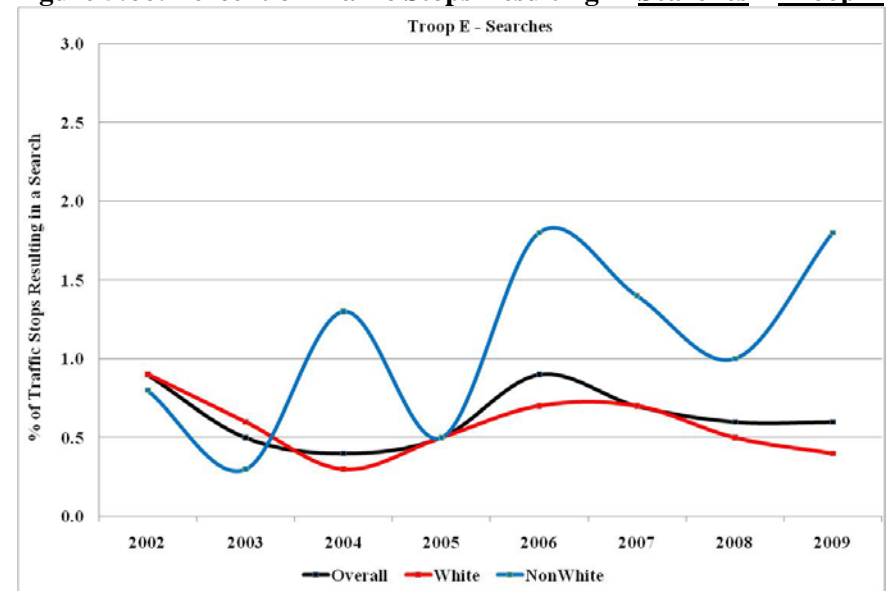
Figure 5:67: Percent of Traffic Stops Resulting in <u>Warnings</u> – <u>Troop B</u>

Figure 5:69: Percent of Traffic Stops Resulting in <u>Arrests</u> – <u>Troop B</u>

Figure 5:68: Percent of Traffic Stops Resulting in <u>Citations</u> – <u>Troop B</u>
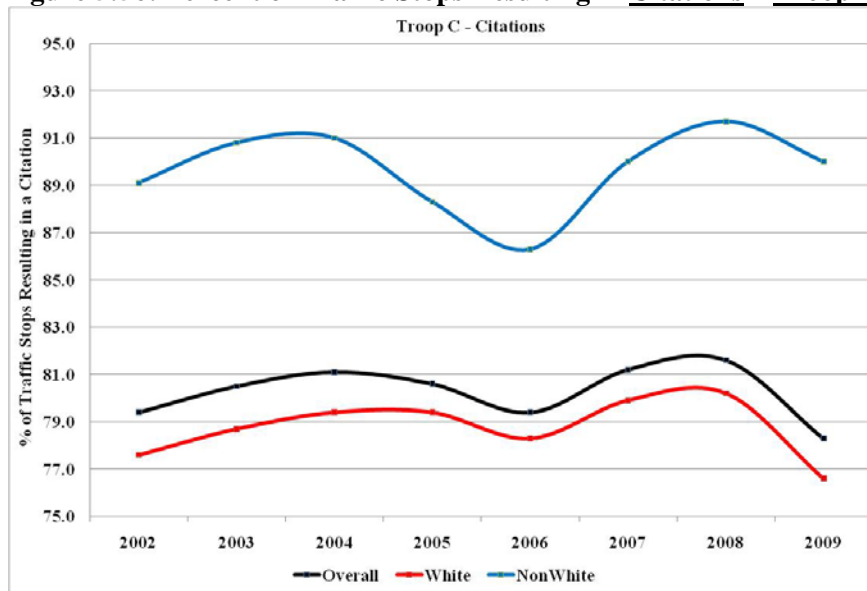

Figure 5:70: Percent of Traffic Stops Resulting in <u>Searches</u> – <u>Troop B</u>

100

Figure 5:71: Percent of Traffic Stops Resulting in <u>Warnings</u> – <u>Troop T</u>

Figure 5:73: Percent of Traffic Stops Resulting in <u>Arrests</u> – <u>Troop T</u>

Figure 5:72: Percent of Traffic Stops Resulting in <u>Citations</u> – <u>Troop T</u>

Figure 5:74: Percent of Traffic Stops Resulting in <u>Searches</u> – <u>Troop T</u>
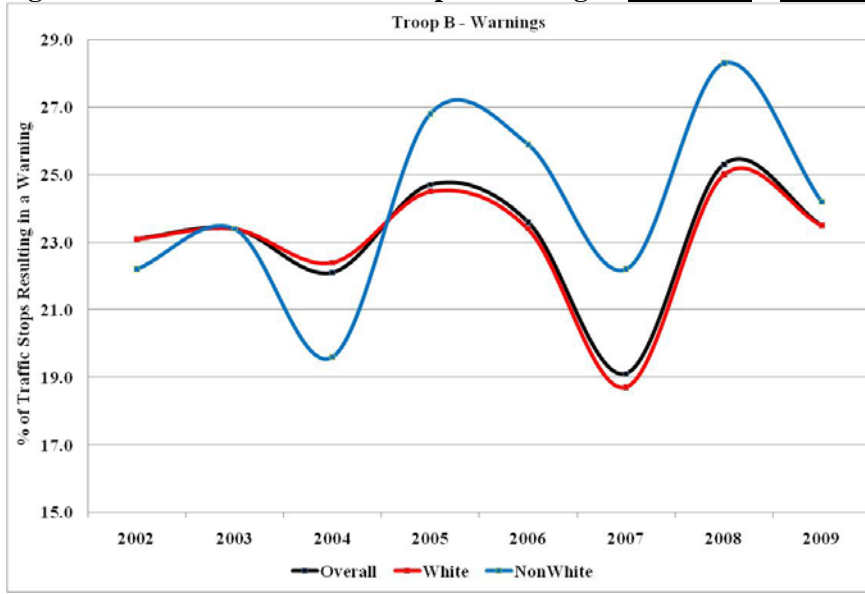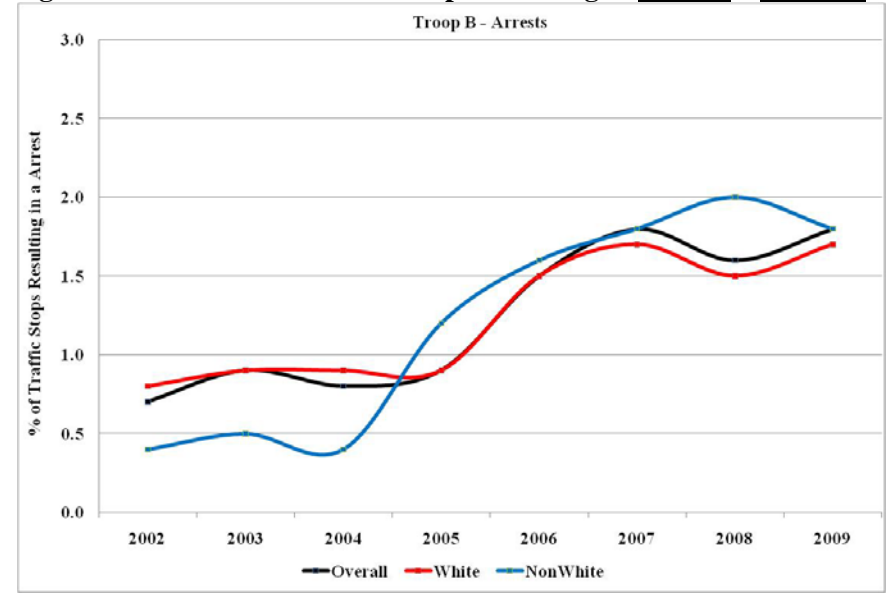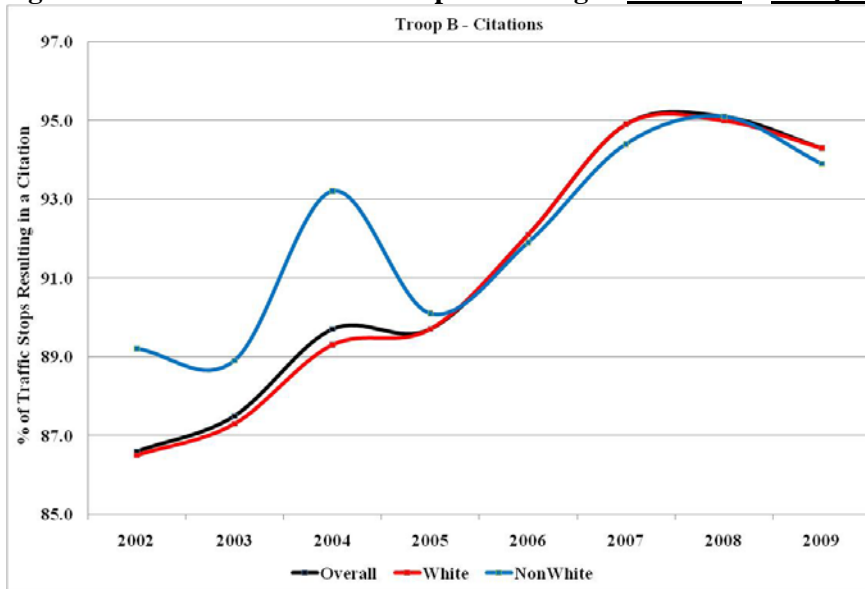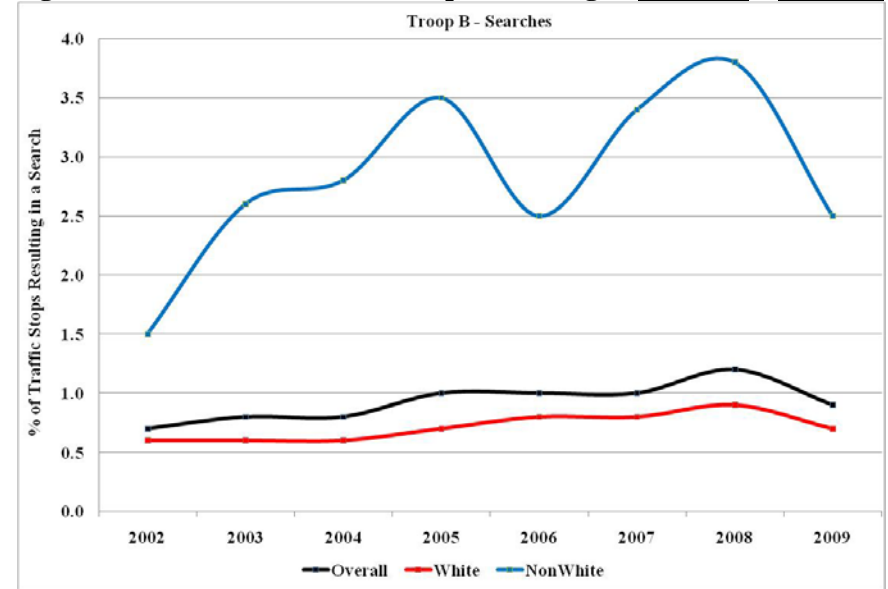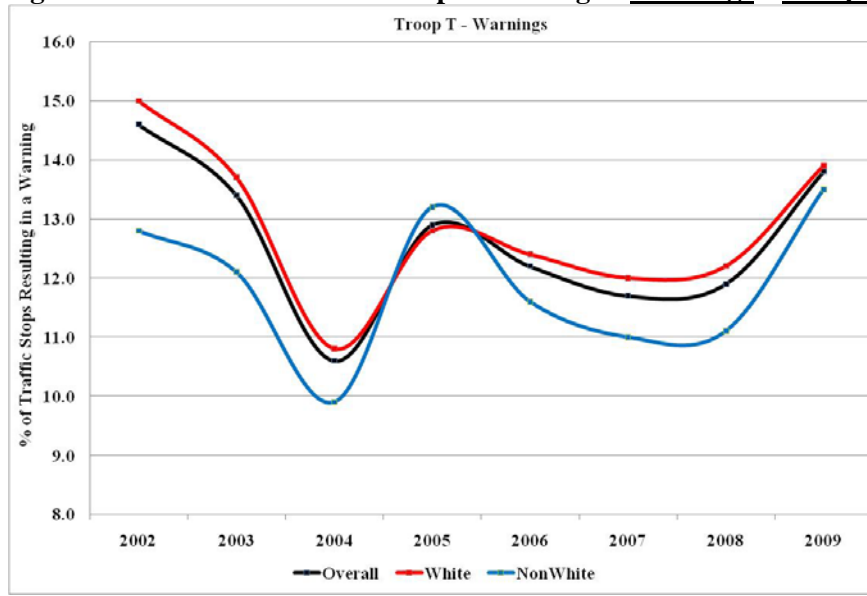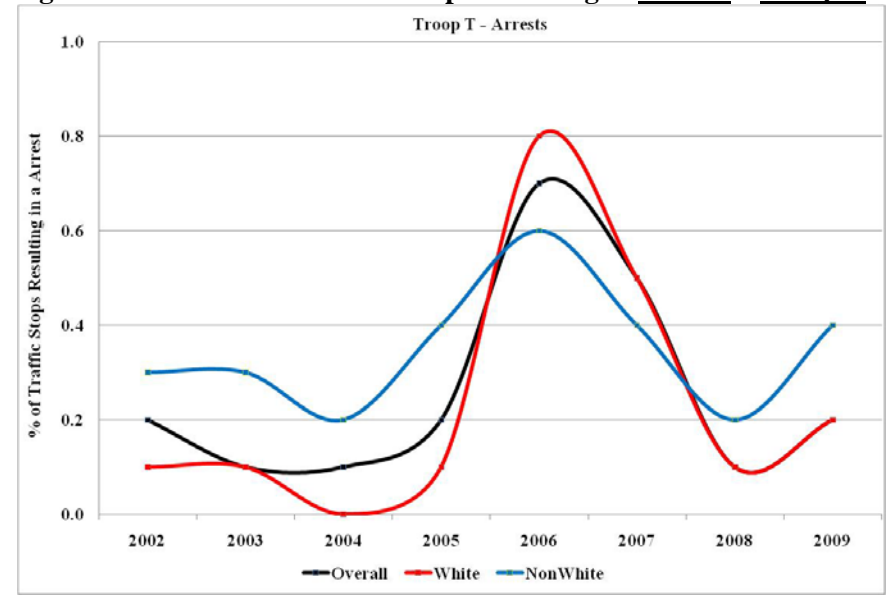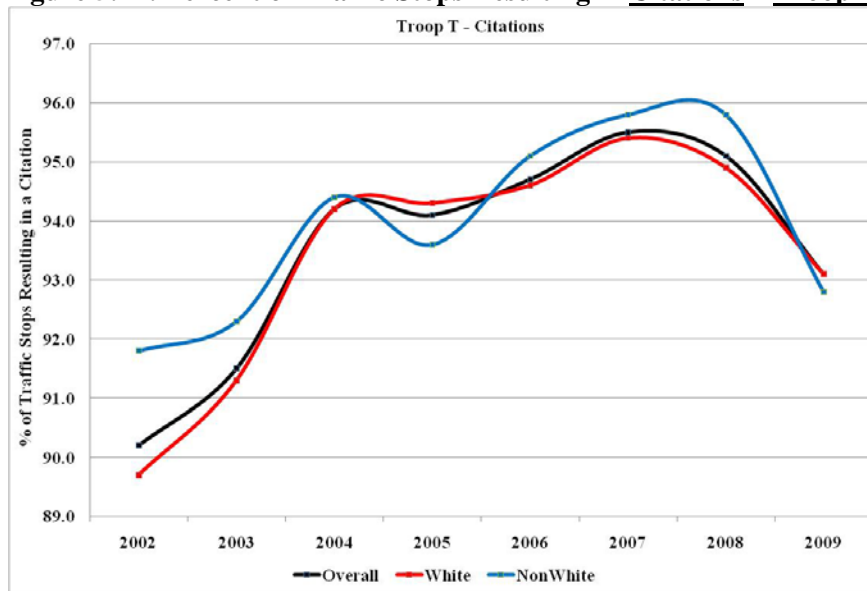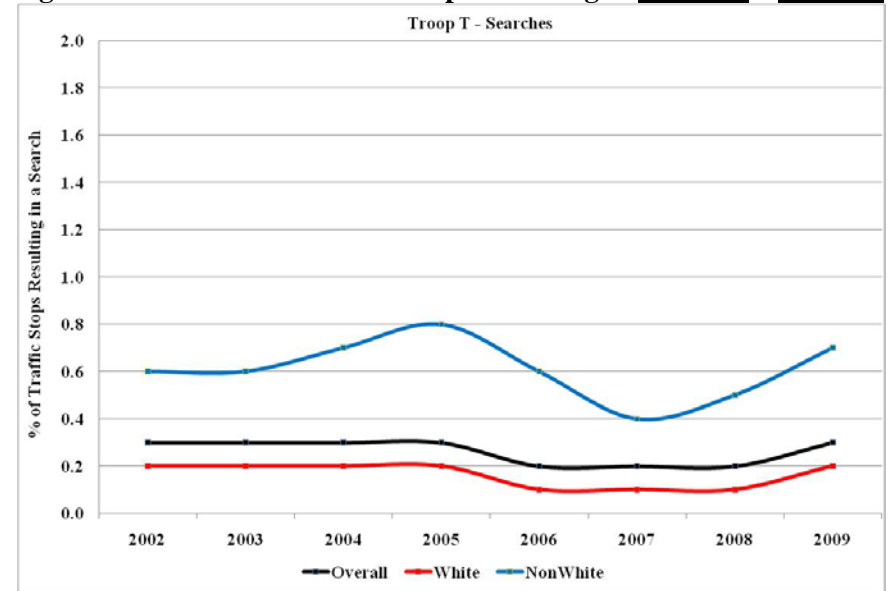
SUMMARY

Traffic Stop Outcomes – Department Wide

- The 2009 warning rate was more than two standard deviations above the seven-year average. The rates of warnings issued have been steadily increasing since 2005, reaching a high of 28.3% in 2009.
- The 2009 citation rate was within one standard deviation of the seven-year average. There are two trends evident based on the eight years of data collection. Between 2002 and 2005, there was a steady increase in citation rates, from a low of 83.0% of all traffic stops, to a high of 88.1% of stops in 2005. Since 2006, the citation rate has been relatively stable, with a slight drop-off in 2009.
- The 2009 arrest rate was within one standard deviation of the seven-year average and slightly more than the 2008 rate. The eight-year trend indicates that there was a considerable rise in the arrest rate between 2004 and 2006, but this upswing is at least partially the result of discrepancies in the data collection regarding arrests prior to 2006, as documented in the *2003 - 2004 Final Report*. Therefore, it is likely that this reported upswing is simply the result of more accurate reporting since 2006, rather than changes in actual outcomes received by motorists. This is further evidenced by the stability in the arrest rate between 2006 and 2009.
- The 2009 search rate was within one standard deviation of the seven-year average and is identical to the 2008 rate. The eight-year trend indicates relative stability in the past four years after an increase in 2005. Similar to the arrest rate, however, there were some data collection problems prior to 2006, which may have resulted in an underreporting of searches throughout the department.
- The 2009 seizure rate was within one standard deviation of the seven-year average and similar to the 2008 seizure rate. Note that the seizure rate includes the discovery of contraband from searches made for any reason.

Traffic Stop Outcomes by Race/Ethnicity – Department Wide

- Warnings: In 2009, the warning rates for Black and Hispanic drivers were slightly higher than the warning rates for White drivers, which mirror the trends in 2007 and 2008. Across the eight years of data collection, the warning rate for White drivers decreased between 2002 and 2005, but increased slightly in the last four years. The warning rates for Black and Hispanic drivers have increased in the past three years. Overall, White drivers had a higher warning rate between 2002 and 2004, but this trend has been reversed in the last three years.
- Citations: In 2009, the citation rate for Black and Hispanic drivers was higher than the rate for White drivers. Throughout the eight years of data collection, the citation rates for all groups increased between 2002 and 2004, but have stabilized in the past four years. Hispanic drivers consistently have the highest rate of citations, while White drivers are consistently the least cited group (except 2007).
- Arrests: In 2009, the arrest rate was highest for Hispanic drivers, followed by Black and White drivers, respectively, and the difference between the groups remained similar to the three previous years. In all years, Hispanic drivers are arrested at a higher rate than

the other two groups, with White drivers generally being arrested less frequently (except 2006). The overall arrest rates prior to 2006 may have been artificially depressed due to underreporting of arrests in those years. This should not, however, influence the differences across racial/ethnic groups, which are consistent across all eight years of data collection.

- Searches: In 2009, the search rate was highest for Black drivers, followed by Hispanic drivers and White drivers. Throughout the eight years of data collection, the search rate of White drivers has been relatively stable, with a slight bump in 2006 and 2007. For Black drivers, the search rate indicates an upward trend between 2002 and 2007, with a slight decrease and stabilization in 2008 and 2009. The search rate for Hispanic drivers also increased in early years of data collection, but has stabilized and decreased since 2005. Note, however, that the dramatic differences across racial/ethnic groups in terms of search rates have persisted across time.

- Seizures: In 2009, the seizure rate was highest for White drivers, followed by Black drivers and Hispanic drivers, respectively. For White drivers, the 2009 seizure rate mirrors the 2007 and 2008 seizure rates. In 2009, the seizure rate for Black drivers fell slightly compared to the previous four years, and the seizure rate for Hispanic drivers also fell slightly in 2009 compared to 2008. Of note, in all eight years of data collection, White drivers are consistently found with contraband at higher rates than either Black or Hispanic drivers.

The temporal trends of the search and seizure rates for White drivers indicate a lower rate of search, but a higher rate of seizure compared to Black and Hispanic drivers. In all years examined, White drivers had the lowest rates of searches, but the highest rates of seizures; conversely, Black and Hispanic drivers experienced a higher rate of searches, but a lower rate of seizures. There are a number of possible explanations for these racial disparities in post-stop outcomes. The rates presented in this section are simply descriptive and do not take into account other legitimate factors that may contribute to these racial/ethnic differences. As a result, any interpretation of these findings must be made with caution.

6. ANALYSES OF TRAFFIC STOP OUTCOMES

OVERVIEW

This section further examines traffic stop outcomes during member-initiated traffic stops conducted in 2009. Building on the descriptive statistics reported in Section 3, this section reports the results of statistical significance testing conducted on warnings, citations, arrests, and searches at the department, area, troop, and station levels. Two sets of analyses are the focal point of this section: 1) analyses examining the relationship between traffic stop outcomes and driver characteristics (i.e., drivers' race/ethnicity and gender) and 2) more sophisticated multivariate analyses on warnings, citations, arrests, and searches. Tables 6.1 & 6.2 document statistically significant differences between racial/ethnic and gender groups for warnings, citations, arrests, and searches across the department, area, and troop levels. All analyses are conducted using the chi-square statistic.[9] Table 6.3 reports statistically significant differences between White and non-White drivers at the station level for warnings, citations, arrests, and searches. These traffic stop outcomes are further explored in hierarchical multivariate statistical analyses presented in Tables 6.4 & 6.5.

BIVARIATE ANALYSES OF TRAFFIC STOP OUTCOMES

All bivariate analyses were based on two comparisons. In separate analyses, drivers' race/ethnicity and drivers' gender were analyzed in relation to all four traffic stop outcomes (i.e., warnings, citations, arrests, and searches). Drivers' race/ethnicity is represented by three categories: White, Black, and Hispanic. Given the relatively small number of traffic stops involving drivers identified as Middle Eastern, Asian, Native American, unknown, or missing, analyses of these stops are not reported. Analyses involving drivers' gender reflect all traffic stops in which drivers' gender was recorded. For each organizational unit, the tables report the total number of stops for each race/ethnicity and gender group and the percent of drivers from each group that were warned, cited, arrested, or searched. Statistically significant relationships are indicated with an asterisk.[10]

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[9] In Tables 6.1– 6.3, the asterisks indicate statistically significant differences in the outcomes received by racial/ethnic and gender groups based on bivariate chi-square associations. Chi-square statistics are based on the differences between groups while considering the sample size. Because this statistical technique is sensitive to sample size, smaller differences between groups can result in statistically significant differences when the sample size is large. Therefore, depending on the sample size used in the chi-square test, statistical significance is reported at the 0.05, 0.01, or 0.001 level. For example, if the 0.05 level is used, a finding is statistically significant if we are 95% confident that the difference between groups is not due to chance; in contrast, a 0.001 level is interpreted as 99.9% confident that the result is not due to chance. Also note that these analyses are based on only the relationship between two variables (e.g., drivers' race and citations). That is, for each chi-square test, the comparison is between one outcome (e.g., citation) and one explanatory variable (e.g., drivers' gender). These findings do not take into account any other factors that might influence the outcome of the stop. Multivariate analyses address this limitation of bivariate analyses and also use asterisks to signify statistical significance (see Tables 6.4 & 6.5). These asterisks, however, represent statistical significance when other factors believed to influence the outcome of stops are taken into account.

[10] The asterisk is only included in the first group of the comparison. For example, if the relationship between racial/ethnic groups (i.e., White, Black, and Hispanic drivers) and warnings was statistically significant, an asterisk is placed beside the rate of warning for White drivers. The correct interpretation of this result is that the rate of warnings significantly differs between the three races/ethnicities, and the actual rate of warnings for each group should be consulted for the rank order of the groups. For each group, the number of asterisks indicates

Table 6.1 illustrates the variation in post-stop outcomes (i.e., warnings, citations, arrests, and searches) by drivers' race/ethnicity and gender for both the department and area levels. Across the department, there were statistically significant differences between drivers' race/ethnicity in all traffic stop outcomes, based on bivariate analyses. Of the Black and Hispanic motorists stopped, 29.5% and 30.0%, respectively, received warnings compared to 28.5% of White drivers stopped. Conversely, Hispanic drivers had slightly higher rates of citations (88.9%), compared to White (86.2%) and Black (87.8%) drivers. Arrest rates also showed statistically significant racial/ethnic disparities, as White drivers were arrested during 1.4% of stops, while Black and Hispanic drivers were arrested during 1.8% and 2.4% of stops, respectively. The largest differences across racial/ethnic groups were found for searches. Of all Black and Hispanic drivers stopped, 3.4% and 3.3% resulted in searches for these racial groups, compared to only 0.8% of White drivers stopped. All of these statistically significant results, reported in Table 6.1, occurred at the 0.001 level indicating that these differences reflect a statistical difference between the groups 99.9% of the time. Based solely on the statistical significance, these results suggest that a difference exists in the rate of warnings, citations, arrests, and searches depending on the race of the driver. It is important to recognize, however, that chi-square analyses do not consider other variables when determining statistical significance. In other words, the chi-square test does not measure other factors potentially associated with the likelihood of receiving post-stop outcomes; rather, it only considers the race/ethnicity of the driver. Further, these statistical tests are influenced by the large sample size. Consequently, the results of these analyses should be interpreted with caution and the multivariate models (reported later in this section) should be examined for a better understanding of the relationship between driver race and post-stop outcomes.

Drivers' gender also produced statistically significant results when examining the data for the entire department. Statistically significant differences were reported for male and female drivers in regard to arrests and searches at the 0.001 level. Of all the male drivers stopped, 1.7% were arrested, compared to 0.9% of all female drivers stopped. Male drivers were also significantly more likely to be searched (1.4% of male drivers stopped) compared to female drivers (0.4% of female drivers stopped). As with the racial differences reported above, these results do not consider the impact of any other factors and should not be considered definitive evidence of disparity. The differences between male and female drivers for warnings and citations were very small and only statistically significant for warnings.

Area level differences in traffic stop outcomes based on racial/ethnic characteristics are also displayed in Table 6.1. Analyses of warnings indicate racial/ethnic differences in all areas except Area II. Blacks and Hispanics were more likely to be warned during stops by Area I Troopers and the Bureau of Patrol, while Whites were most likely to be warned in Areas III and IV. All areas demonstrated statistically significant racial/ethnic differences in rates of citations. No clear trend can be discerned from these results as the statistical significance level and rank ordering of the racial/ethnic groups varied by areas. For arrests, four of the five areas reported statistically significant differences across racial/ethnic groups. In all four

the degree of statistical significance as described at the bottom of all tables in this section. Statistical significance is reported at the 0.05, 0.01, and 0.001 levels.

areas, Black and Hispanic drivers displayed disproportionately higher rates of arrest than Whites. Finally, all five areas demonstrated statistically significant racial/ethnic differences in search rates, with Black and Hispanic drivers consistently being searched proportionately more frequently in all areas compared to White drivers.

Analyses of drivers' gender also demonstrated statistically significant differences. As demonstrated in Table 6.1, Area I and the Bureau of Patrol reported statistically significant differences across gender for warnings, and only the Bureau of Patrol indicated statistically significant differences for citations. Statistically significant differences across gender groups were evident in all five areas for both arrests and searches. In all cases, male drivers were arrested and searched disproportionately more than female drivers.

Again, it is important to recognize that racial/ethnic or gender differences are not evidence of bias-based policing because other factors related to these traffic stop outcomes were not considered in these analyses. Refer to the multivariate analyses for a more sophisticated examination of the relationship between driver characteristics and traffic stop outcomes.

Table 6.1: 2009 Stop Outcomes by Race and Gender for Department and Areas

	Drivers	Total # of Stops	% Drivers Warned	% Drivers Cited	% Drivers Arrested	% Drivers Searched
PSP Dept	White	256,164	28.5***	86.2***	1.4***	0.8***
	Black	26,831	29.5	87.8	1.8	3.4
	Hispanic	10,448	30.0	88.9	2.4	3.3
	Male	204750	28.4*	86.6	1.7***	1.4***
	Female	101505	28.1	86.7	0.9	0.4
AREA I	White	40,829	36.1***	87.2***	2.6***	2.0***
	Black	8,343	44.1	85.7	3.2	6.4
	Hispanic	4,225	39.9	88.8	3.6	5.1
	Male	37,758	37.9**	87.2	3.2***	3.5***
	Female	18,106	36.5	87.2	1.8	1.5
AREA II	White	40,823	25.1	86.8**	1.2*	0.8***
	Black	2,910	23.7	88.0	1.7	3.2
	Hispanic	1,627	26.2	89.2	1.7	2.2
	Male	31,781	24.8	87.0	1.5***	1.2***
	Female	15,505	24.6	87.5	0.5	0.4
AREA III	White	64,971	31.1**	83.4***	1.4***	0.7***
	Black	4,222	29.6	86.1	1.8	2.9
	Hispanic	1,411	28.1	87.7	3.3	3.7
	Male	47,579	30.6	83.8	1.7***	1.1***
	Female	7,778	31.0	83.7	0.8	0.4
AREA IV	White	62,296	34.2***	82.7***	1.7	0.7***
	Black	3,726	31.1	85.8	1.7	2.7
	Hispanic	976	29.6	84.6	1.6	2.2
	Male	46,055	33.7	83.1	2.0***	1.0***
	Female	23,137	33.5	83.1	1.0	0.3
BUREAU OF PATROL	White	47,166	13.9*	93.1***	0.2***	0.2***
	Black	7,601	14.9	91.8	0.5	0.9
	Hispanic	2,203	15.3	91.5	0.4	1.0
	Male	41,490	14.2***	92.8**	0.3**	0.4***
	Female	19,637	12.8	93.5	0.1	0.1

NOTE: Asterisks identify statistically significant chi-square associations. * p < .05 ** p<.01 *** p<.001

Table 6.2 displays differences in traffic stop outcomes by drivers' race/ethnicity and gender at the troop level. Nine of the 16 troops show statistically significant racial/ethnic differences in warnings. Of the nine troops with statistically significant differences, five troops had at least one minority group with the highest rate of warnings, while in the other four troops White drivers received disproportionately more warnings. For citations, eight of the 16 troops reported a statistically significant difference between racial/ethnic groups. Of the eight troops with statistically significant differences, five troops reported at least one minority group with the highest rate of citations. Seven of 16 troops reported statistically significant differences in arrest rates across racial/ethnic groups, with either Black or Hispanic drivers ranking highest in the rate of arrest in all but one of these seven troops. In addition, 15 of the 16 troops demonstrated statistically significant racial/ethnic differences in the rate of searches, and in all cases, Black and Hispanic drivers were subject to proportionately more searches compared to White drivers. In some troops, the differences between races/ethnicities were quite large.

Table 6.2 also reports differences in traffic stop outcomes by drivers' gender at the troop level. Four of the 16 troops reported statistically significant differences in warnings; in all but one of these troops, male drivers received proportionately more warnings compared to female drivers. For citations, six of the 16 troops indicated statistically significant differences in the citation rate between male and female drivers. In half of these troops with statistically significant differences, male drivers received disproportionately more citations. All but one of the 16 troops demonstrated statistically significant gender differences in rates of arrest – male drivers were arrested disproportionately more frequently than female drivers in all of these troops. Finally, all 16 troops indicated statistically significant differences in search rates for male and female drivers. In all of these troops, male drivers were searched disproportionately more frequently compared to female drivers.

Table 6.3 presents the results of bivariate analyses between drivers' race/ethnicity and traffic stop outcomes at the station level for 2009. In contrast to information provided in Tables 6.1 & 6.2, the racial/ethnic categories presented in Table 6.3 are restricted to White and non-White because the number of stops of some racial/ethnic groups is too small for individual comparisons at the station level. The "non-White" category includes Black, Black Hispanic, White Hispanic, Native American, Middle Eastern, and Asian drivers. Analyses examining the relationship between drivers' gender and traffic stops outcomes at the station level are not reported, however, are available from the author(s) upon request. As shown in Table 6.3, statistically significant racial differences in the rates of warnings and citations are evident in 25 and 28 stations, respectively. Twenty stations show significant racial differences in the rates of arrests. Over half (n=48) of all stations show statistically significant racial differences in the rates of searches.

Table 6.2: **2009 Stop Outcomes by Race and Gender for Troops (p. 1 of 3)**

Drivers		Total # of Stops	% Drivers Warned	% Drivers Cited	% Drivers Arrested	% Drivers Searched
Area I, Troop J	White	10,435	30.4***	93.6	3.6***	1.6***
	Black	1,468	33.2	93.3	5.5	4.4
	Hispanic	1,336	40.3	94.7	6.9	4.3
	Male	8,979	32.0	93.8	4.8***	2.7***
	Female	4,701	30.8	93.7	2.7	1.2
Area I, Troop K	White	10,225	41.4***	85.0	2.7	4.5***
	Black	4,497	51.3	84.1	2.8	8.7
	Hispanic	892	49.7	85.9	3.0	10.3
	Male	11,495	45.3***	84.8	3.1***	6.9***
	Female	5,155	42.0	85.8	1.5	3.1
Area I, Troop L	White	9,259	32.5	88.4	1.8	.6***
	Black	675	33.9	85.9	0.9	2.2
	Hispanic	693	35.4	87.9	2.0	1.9
	Male	7,292	32.4	88.4	2.1***	1.0***
	Female	3,661	32.6	88.0	1.0	0.3
Area I, Troop M	White	10,910	39.5**	82.2*	2.3*	1.4***
	Black	1,703	38.6	83.4	3.1	3.5
	Hispanic	1,304	35.2	85.4	1.5	4.1
	Male	9,992	38.6	83.4**	2.5*	2.3***
	Female	4,589	39.3	81.4	1.8	0.8
Area II, Troop F	White	19,550	23.6***	86.1***	1.1	0.6***
	Black	1,027	17.1	90.8	1.2	2.5
	Hispanic	404	17.8	89.4	1.7	1.2
	Male	14,330	23.2	86.3	1.4***	0.9***
	Female	7,472	22.7	87.0	0.5	0.4
Area II, Troop N	White	8,092	22.2**	90.7**	1.1**	0.7***
	Black	1,163	25.5	87.8	2.2	2.6
	Hispanic	776	26.5	90.5	1.5	2.1
	Male	7,064	22.6	90.2*	1.6***	1.2***
	Female	3,538	22.2	91.4	0.5	0.4

NOTE: Asterisks identify statistically significant chi-square associations. $* \ p < .05$ $** \ p<.01$ $*** \ p<.001$

Table 6.2: 2009 Stop Outcomes by Race and Gender for Troops (p. 2 of 3)

	Drivers	Total # of Stops	% Drivers Warned	% Drivers Cited	% Drivers Arrested	% Drivers Searched
Area II, Troop P	White	7,108	28.0**	83.4**	1.4	0.7
	Black	171	19.9	89.5	0.6	1.2
	Hispanic	133	19.5	92.5	3.0	0.8
	Male	5,203	26.4**	84.4*	1.7**	0.9**
	Female	2,309	29.7	82.5	0.8	0.3
Area II, Troop R	White	6,073	30.3**	87.7**	1.4	1.4***
	Black	549	33.5	82.9	1.8	6.4
	Hispanic	314	39.2	84.7	1.3	4.1
	Male	5,184	30.4	87.2	1.7***	2.4***
	Female	2,186	29.7	88.1	0.5	0.7
Area III, Troop A	White	17,100	32.5	85.0	1.5	0.8***
	Black	603	31.0	88.4	2.5	4.3
	Hispanic	92	33.7	87.0	3.3	2.2
	Male	11,984	32.4	85.2	2.0***	1.2***
	Female	6,071	32.1	85.1	0.8	0.6
Area III, Troop G	White	27,045	35.7	78.9	0.7*	0.5***
	Black	1,817	36.9	79.3	0.7	2.1
	Hispanic	498	31.7	82.1	1.8	3.6
	Male	20,120	35.0	79.2	0.9***	0.8***
	Female	10,455	36.1	79.3	0.3	0.3
Area III, Troop H	White	20,826	23.9	87.9***	2.1***	0.9***
	Black	1,802	21.7	92.3	2.7	3.2
	Hispanic	821	25.2	91.1	4.1	3.9
	Male	15,475	23.5	88.8	2.6***	1.6***
	Female	8,555	24.0	87.9	1.6	0.5
Area IV, Troop C	White	16,157	37.6***	76.6***	1.2**	0.3***
	Black	1,034	23.7	88.5	0.0	1.1
	Hispanic	454	19.2	90.3	0.7	1.1
	Male	12,726	34.9	79.0***	1.2	0.4*
	Female	5,784	36.4	76.7	0.9	0.2

NOTE: Asterisks identify statistically significant chi-square associations. * $p < .05$ ** $p < .01$ *** $p < .001$

Table 6.2: 2009 Stop Outcomes by Race and Gender for Troops (p. 3 of 3)

	Drivers	Total # of Stops	% Drivers Warned	% Drivers Cited	% Drivers Arrested	% Drivers Searched
Area IV, Troop D	White	14,436	34.1	85.9	1.9	1.2***
	Black	958	37.1	83.6	2.5	4.0
	Hispanic	150	35.3	83.3	.7	4.0
	Male	10,424	34.2	85.6	2.4***	1.9***
	Female	5,504	34.1	86.2	0.9	0.5
Area IV, Troop E	White	17,531	39.8	76.5	1.9	0.4***
	Black	767	39.8	76.0	2.6	2.5
	Hispanic	285	44.6	73.3	3.5	2.5
	Male	12,545	40.4**	75.8**	2.4***	0.7***
	Female	6,676	38.3	77.7	1.1	0.2
Area IV, Troop B	White	14,172	23.5	94.3	1.7	0.7***
	Black	967	26.1	92.9	2.1	3.2
	Hispanic	87	25.3	94.3	2.3	3.4
	Male	10,360	23.6	94.4	1.9*	1.1***
	Female	5,173	23.4	93.9	1.4	0.4
Area V, Troop T	White	47,166	13.9*	93.1***	0.2***	0.2***
	Black	7,601	14.9	91.8	0.5	0.9
	Hispanic	2,203	15.3	91.5	0.4	1.0
	Male	41,490	14.2***	92.8**	0.3**	0.4***
	Female	19,637	12.8	93.5	0.1	0.1

NOTE: Asterisks identify statistically significant chi-square associations. * p < .05 ** p<.01 *** p<.001

Table 6.3: 2009 Stop Outcomes by Race for Station (p. 1 of 5)

	Drivers	Total # of Stops	% Drivers Warned	% Drivers Cited	% Drivers Arrested	% Drivers Searched
AREA I, Troop J						
Avondale	White	2,327	41.7***	90.3	3.4***	3.5
	Non-White	909	48.5	92.0	6.7	5.0
Embreeville	White	3,089	23.8*	93.8	2.4**	1.2***
	Non-White	1,132	27.4	95.3	4.1	3.8
Ephrata	White	1,393	27.4	95.3	3.0*	1.0***
	Non-White	256	32.8	96.5	5.9	3.9
Lancaster	White	3,696	30.2	94.9	5.1	1.1***
	Non-White	878	32.1	94.1	6.2	2.7
AREA I, Troop K						
Media	White	3,048	45.6***	74.3***	3.5	5.6***
	Non-White	1,298	56.9	69.6	4.2	13.9
Philadelphia	White	5,294	39.2***	91.6***	1.6	3.7***
	Non-White	4,531	47.8	89.5	1.9	6.5
Skippack	White	1,965	40.7	83.8	4.1	4.7
	Non-White	514	40.7	86.6	3.5	5.3
AREA I, Troop L						
Frackville	White	1,944	29.6	90.8	1.5	0.7
	Non-White	319	27.6	94.0	0.9	0.6
Hamburg	White	1,161	33.6***	93.7	0.5	0.0*
	Non-White	295	21.7	94.9	0.0	0.3
Jonestown	White	2,836	29.5	82.5*	3.2	0.7***
	Non-White	629	33.2	79.2	1.9	3.0
Reading	White	1,677	36.9	90.6	1.4	1.0
	Non-White	296	38.9	93.6	2.0	1.7
Schuykill Haven	White	1,657	35.7*	89.4	1.1	0.2**
	Non-White	140	45.0	84.3	0.7	1.4
AREA I, Troop M						
Belfast	White	1,986	25.1	84.3	1.1	0.8*
	Non-White	687	24.6	83.1	0.4	1.7
Bethlehem	White	1,034	33.0	87.7	2.3	1.8**
	Non-White	353	33.7	88.7	4.0	4.5
Dublin	White	2,548	53.8	76.4	3.6*	2.3
	Non-White	317	54.6	80.8	1.3	1.6
Fogelsville	White	2,612	43.8	78.4	1.2	1.3***
	Non-White	943	45.5	79.3	1.4	5.1
Trevose	White	2,761	35.1	87.5	3.0	0.9***
	Non-White	1,340	33.7	88.6	3.5	2.8

NOTE: Asterisks identify statistically significant chi-square associations. * $p < .05$ ** $p < .01$ *** $p < .001$

Table 6.3: 2009 Stop Outcomes by Race for Station (p. 2 of 5)

	Drivers	Total # of Stops	% Drivers Warned	% Drivers Cited	% Drivers Arrested	% Drivers Searched
AREA II, Troop F						
Coudersport	White	1,833	40.5	67.9	1.5	0.5
	Non-White	49	40.8	75.5	0.0	2.0
Emporium	White	1,069	38.4	73.5	0.4	0.0
	Non-White	8	12.5	100.0	0.0	0.0
Lamar	White	2,942	18.2	84.4**	2.1*	0.3**
	Non-White	608	15.0	89.3	0.7	1.2
Mansfield	White	2,102	32.7***	77.8*	1.3	0.5
	Non-White	184	21.2	85.3	0.5	1.1
Milton	White	3,119	14.4	96.1*	0.4	0.3
	Non-White	622	12.2	98.1	0.2	0.0
Montoursville	White	3,435	18.2	91.7*	1.1***	1.0***
	Non-White	264	20.1	87.1	3.8	7.2
Selinsgrove	White	3,209	16.3	92.1	0.4	0.3
	Non-White	285	14.0	93.3	0.7	0.7
Stonington	White	2,020	35.2	85.0	1.7*	1.8
	Non-White	53	34.0	83.0	5.7	3.8
AREA II, Troop N						
Bloomsburg	White	1,459	17.8	90.4	0.2	0.2
	Non-White	398	15.3	90.7	0.0	0.3
Fern Ridge	White	1,909	15.9	93.8	0.4	0.1***
	Non-White	580	17.1	94.3	0.5	1.0
Hazelton	White	1,077	28.9	88.1	1.5	2.0
	Non-White	394	24.4	90.9	0.5	1.5
Lehighton	White	1,601	20.8*	89.0	1.6	1.1
	Non-White	191	27.2	92.1	1.6	2.6
Swiftwater	White	2,106	28.3	90.6**	2.0*	0.7***
	Non-White	887	30.6	86.8	3.4	3.2
AREA II, Troop P						
Laporte	White	1,527	26.5	78.5	0.7	1.1
	Non-White	44	22.7	79.5	0.0	2.3
Shickshinny	White	1,048	33.1	84.4	0.8	0.0
	Non-White	65	27.7	90.8	3.1	0.0
Towanda	White	2,023	45.2	72.2	0.9	1.6
	Non-White	65	38.5	76.9	0.0	3.1
Tunkhannock	White	883	22.8*	91.6	6.6	0.0
	Non-White	25	4.0	92.0	12.0	0.0
Wyoming	White	1,641	7.5	97.1	0.5	0.1
	Non-White	191	8.9	97.4	0.0	0.5

NOTE: Asterisks identify statistically significant chi-square associations. * p < .05 ** p<.01 *** p<.001

Table 6.3: 2009 Stop Outcomes by Race for Station (p. 3 of 5)

	Drivers	Total # of Stops	% Drivers Warned	% Drivers Cited	% Drivers	% Drivers Searched
AREA II, Troop R						
Blooming Grove	White	1,607	35.6*	91.1*	1.6	2.0
	Non-White	268	42.9	86.9	2.2	3.7
Dunmore	White	1,519	34.0	80.6	0.9	1.1***
	Non-White	368	35.3	80.2	1.1	4.6
Gibson	White	1,723	25.7*	88.0	1.6*	1.0***
	Non-White	543	21.2	88.8	0.4	3.5
Honesdale	White	1,251	25.1	91.8	1.5*	1.8*
	Non-White	91	23.1	92.3	4.4	5.5
AREA III, Troop A						
Ebensburg	White	3,838	25.5	84.4	2.1	0.3***
	Non-White	170	21.8	85.9	2.4	1.8
Greensburg	White	3,933	45.1	79.0**	1.3	0.8***
	Non-White	177	46.9	88.1	2.8	6.2
Indiana	White	4,088	30.4	83.1	0.8	0.4***
	Non-White	275	26.2	86.9	0.7	2.2
Kiski Valley	White	3,068	21.0	91.0	1.9	2.2
	Non-White	240	23.3	90.8	2.5	4.2
Somerset (A)	White	2,214	41.6	91.8	1.9	0.6
	Non-White	52	36.5	98.1	1.9	0.0
AREA III, Troop G						
Bedford	White	3,402	48.2	68.3*	1.0	0.7***
	Non-White	427	50.6	62.5	0.9	6.1
Hollidaysburg	White	2,468	47.3*	79.3	0.4	0.4***
	Non-White	248	40.7	80.6	1.2	2.0
Huntingdon	White	3,937	44.3	68.1	1.2	0.5*
	Non-White	102	46.1	67.6	0.0	2.0
Lewiston	White	4,565	22.8**	91.5	0.6	0.5***
	Non-White	530	28.3	90.9	0.6	1.9
McConnellsburg	White	4,587	53.4***	66.7***	0.6	0.6
	Non-White	1,185	42.4	79.2	0.7	0.8
Philipsburg	White	3,296	35.6***	79.6	0.7	0.0
	Non-White	264	22.3	84.1	0.0	0.0
Rockview	White	4,834	9.4	94.0	0.4	0.3***
	Non-White	730	9.6	93.7	0.7	1.4

NOTE: Asterisks identify statistically significant chi-square associations. * $p < .05$ ** $p<.01$ *** $p<.001$

Table 6.3: 2009 Stop Outcomes by Race for Station (p. 4 of 5)

	Drivers	Total # of Stops	% Drivers Warned	% Drivers Cited	% Drivers Arrested	% Drivers Searched
AREA III, Troop H						
Carlisle	White	6,200	17.4	90.5	3.2*	1.1***
	Non-White	795	17.4	92.1	4.9	3.9
Chambersburg	White	2,733	37.1	89.4**	0.6	0.8***
	Non-White	311	42.8	94.2	1.3	4.5
Gettysburg	White	2,798	31.9	78.8***	1.6**	0.7***
	Non-White	514	28.0	85.8	3.9	3.1
Harrisburg	White	1,780	22.1	91.9	1.4	0.8**
	Non-White	451	25.5	92.9	1.8	2.4
Lykens	White	1,765	35.5	71.2	1.8	1.4
	Non-White	53	39.6	67.9	1.9	3.8
Newport	White	2,425	20.0	93.5	3.9	0.4**
	Non-White	279	16.1	95.0	3.9	1.8
York	White	3,169	15.8	92.8	1.1	1.0
	Non-White	756	13.5	94.7	1.6	1.9
AREA IV, Troop C						
Clarion	White	1,875	44.3***	71.6***	0.2	0.4***
	Non-White	502	29.7	82.3***	0.2	1.8
Clearfield	White	3,259	23.6***	94.8***	0.4	0.3
	Non-White	889	12.9	97.5	0.1	0.3
Dubois	White	2,794	25.8***	83.7***	0.9*	0.1
	Non-White	571	13.0	93.5	0.0	0.4
Kane	White	1,911	40.9*	75.1	4.2*	0.3
	Non-White	145	31.7	77.2	0.7	0.0
Punxsutawney	White	2,359	51.1***	64.1***	1.8	0.5***
	Non-White	76	31.6	82.9	1.3	3.9
Ridgway	White	2,481	33.3	73.8	1.1	0.2
	Non-White	107	38.3	71.0	0.0	0.9
Tionesta	White	1,508	63.0	56.7*	0.5	0.1
	Non-White	33	48.5	78.8	0.0	0.0
AREA IV, Troop D						
Beaver	White	3,100	25.0	92.9	1.1**	0.3***
	Non-White	280	28.6	90.0	3.2	3.9
Butler	White	3,747	53.3	82.5	3.5	0.9
	Non-White	249	51.4	84.7	2.0	2.0
Kittanning	White	2,404	30.0	80.9	2.5	3.1
	Non-White	177	29.4	82.5	1.1	4.5
Mercer	White	2,573	36.3	81.3	0.6	1.3*
	Non-White	534	39.5	81.1	0.0	2.8
New Castle	White	2,638	19.0	91.3	1.1***	1.0
	Non-White	226	19.5	91.2	4.9	2.2

NOTE: Asterisks identify statistically significant chi-square associations. * p < .05 ** p<.01 *** p<.001

Table 6.3: 2009 Stop Outcomes by Race for Station (p. 5 of 5)

	Drivers	Total # of Stops	% Drivers Warned	% Drivers Cited	% Drivers Arrested	% Drivers Searched
AREA IV, Troop E						
Corry	White	1,411	46.9	67.2**	3.2	0.6
	Non-White	37	59.5	45.9	0.0	0.0
Erie	White	4,350	40.6	78.9	2.4	0.6***
	Non-White	547	39.5	76.6	2.9	2.7
Franklin	White	1,679	65.2	62.0**	1.8*	0.5
	Non-White	228	65.4	51.8	0.0	0.9
Girard	White	3,093	37.4	82.6**	2.0	0.3**
	Non-White	324	36.1	88.6	1.9	1.2
Meadville	White	5,928	31.0	79.0	1.0	0.4**
	Non-White	471	27.2	80.0	1.7	1.3
Warren	White	1,136	41.1	71.0	2.8*	0.7*
	Non-White	17	58.8	52.9	11.8	5.9
AREA IV, Troop B						
Belle Vernon	White	2,294	19.1	98.1	0.4	0.3*
	Non-White	230	18.7	98.3	0.9	1.3
Pittsburgh	White	3,122	19.8**	98.0**	0.5	0.6
	Non-White	406	25.4	95.8	0.7	0.7
Uniontown	White	4,396	25.7	88.8	4.2	1.3***
	Non-White	279	29.7	88.2	6.1	5.7
Washington	White	3,126	15.7	96.7*	0.4	0.5***
	Non-White	340	17.1	94.1	0.0	2.9
Waynesburg	White	1,259	52.0	91.4	1.8	0.8
	Non-White	81	48.1	90.1	3.7	2.5
Bureau of Patrol, Troop T						
Bowmansville	White	7,045	10.3***	94.9***	0.3	0.2***
	Non-White	2,300	14.2	91.7	0.5	1.4
Everett	White	10,328	9.4	95.1**	0.1	0.1*
	Non-White	3,719	8.4	96.2	0.2	0.3
Gibsonia	White	3,777	12.2	94.2	0.2*	0.1*
	Non-White	728	12.1	94.2	0.5	0.4
Highspire	White	12	58.3	50.0	0.0	8.3
	Non-White	2	50.0	50.0	0.0	0.0
King of Prussia	White	6,685	24.0	85.6	0.4*	0.3***
	Non-White	2,219	22.7	85.0	0.7	1.0
New Stanton	White	5,668	11.7**	93.9*	0.2	0.2**
	Non-White	932	15.2	91.8	0.4	0.8
Newville	White	5,944	17.1**	97.7	0.1	0.2***
	Non-White	1,484	13.9	97.4	0.2	0.6
Pocono	White	4,381	15.7	91.6	0.1	0.2
	Non-White	918	15.6	92.0	0.2	0.4
Somerset (T)	White	3,486	12.1**	90.1***	0.1	0.1
	Non-White	1,499	9.5	93.5	0.2	0.3

NOTE: Asterisks identify statistically significant chi-square associations. * $p < .05$ ** $p<.01$ *** $p<.001$

Tables 6.1 - 6.3 illustrate the wide variation in traffic stop outcomes across drivers' racial/ethnic and gender groups at the department, area, troop, and station levels for 2009. It is important to reiterate, however, that the relationships reported in the previous tables are bivariate relationships and thus, do not statistically control for other relevant legal and extralegal factors that might influence officer decision-making. Therefore, the information provided in these tables cannot be used to assess whether the differences in outcomes across racial/ethnic and gender groups are due to Trooper bias. It is plausible that racial/ethnic and gender differences in post-stop outcomes exist due to legal and extralegal reasons other than race/ethnicity and gender. To explore these possibilities, more advanced statistical analyses that control for other legally relevant variables are presented below. The information reported in Tables 6.1 – 6.3 is included in this report solely to provide details to PSP administrators regarding differences in post-stop outcomes at the department, area, troop, and station levels. Although this information will allow PSP administrators to identify potential problems and target specific troops and stations for policy interventions, it cannot be the sole source of information used to examine whether discriminatory practices exist.

MULTIVARIATE ANALYSES IN TRAFFIC STOP OUTCOMES

A multivariate statistical model takes many different factors/variables into account when attempting to understand a particular behavior or outcome, such as the outcomes associated with traffic stops. Unlike a bivariate model, it does not simply assess the relationship between two variables. Rather, a multivariate model examines many variables simultaneously, and therefore provides a more thorough and accurate interpretation of the data.

Many factors other than drivers' race/ethnicity are likely to influence officers' decision making once a traffic stop has been made. For example, other driver characteristics, vehicle characteristics, stop characteristics, reasons for the stop, other legal variables, and Trooper characteristics have all been hypothesized to influence post-stop outcomes. Multivariate analyses examine the independent effect of these predictor variables, while controlling for the influence of the other variables. For example, the influence of drivers' race/ethnicity can be examined while holding constant the predictive power of drivers' age, reason for the stop, time of day, etc.

Multivariate analyses are conducted on information collected at one level and reflect a one-to-one ratio between variables. In other words, all variables within the dataset are independent of other variables. Traffic stop data, however, do not conform to this rule because both traffic stop and Trooper characteristics are hypothesized to influence traffic stop outcomes, and one Trooper generally initiates more than one traffic stop. For example, one Trooper may initiate hundreds or thousands of traffic stops throughout the year thus creating a one-to-many ratio between Trooper characteristics and other traffic stop characteristics. Traffic stop datasets include information from two sources: 1) the traffic stop encounter information, such as traffic stop outcomes, driver characteristics, stop characteristics, etc., and 2) organizational information representing the aggregated characteristics of the Troopers within that unit (i.e., PSP stations), such as the average level of Trooper's education within each station, or the average Trooper age within each station, etc. A special type of multivariate modeling, referred to as hierarchical linear and nonlinear

modeling (bi-level modeling), is required for data reflecting more than one level of aggregation, such as traffic stops.[11]

These bi-level models are interpreted in a similar fashion to other multivariate models. The information of note is contained in two values produced from the analyses: 1) the coefficient, or predicted log-odds, and 2) the odds ratio for each independent variable in the model. The coefficient represents an additive expression of a particular variable. In the "coefficient" column, the asterisk indicates that a significant relationship exists between the independent variable (e.g., male drivers) and the dependent variable (e.g., warnings). If an asterisk is not present, the relationship is not considered statistically significant. Due to the extremely large number of traffic stops at level 1, the statistical significance of the relationships is assessed at the 0.001 level. The coefficient is also accompanied by a sign (i.e., positive or negative), which indicates the direction of the relationship. For example, a positive sign on the "driver male" variable would indicate that male drivers were *more* likely than female drivers to receive a particular outcome, while a negative sign would indicate that males were *less* likely than females to receive a particular outcome.

The second important piece of information from the model is the odds ratio. The odds ratio indicates the <u>strength</u> of the relationship.[12] For example, an odds ratio of 3.0 indicates that the presence of the variable (e.g., a male driver) roughly leads to three times the likelihood of receiving the outcome (e.g., a warning). [13] The strength of the relationship is one of the most important considerations. Even if the relationship between variables is statistically significant, it may not be substantively important due to the large sample size. Therefore, the odds ratio is important to consider when determining the amount of influence particular factors have over the post-stop outcomes.

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[11] Using data at two or more levels of aggregation introduces a statistical dilemma where regression residuals for the level 1 cases (traffic stops) within the same level 2 units (station characteristics) may be correlated (i.e., are more similar than level 1 cases taken from independent stations). This violates the assumption of independence that underlies most ordinary regression techniques. The implications of violating this assumption are substantial, as dependence can lead to inefficient estimates and biased test statistics, making the analyses appear to have more power than they do (Raudenbush & Bryk, 2002). Hierarchical linear modeling (HLM) is a modeling procedure that can overcome this statistical dilemma (Raudenbush & Bryk, 2002). HLM includes an extra error term, Ui, which reflects the extra variation common to all level 1 cases within the level 2 unit, so the level 1 error term (Rij) can be independent. That is, HLM explicitly models the dependence of the residuals through this error term. For binary outcome variables like the ones utilized here, hierarchical models cannot use the standard level 1 model which assumes a linear model and normally distributed errors at level 1, once the additional error term is included (Raudenbush & Bryk, 2002). To account for these characteristics of this type of dependent variable, we employ a nonlinear form of hierarchical modeling that uses a binomial sampling model with a Bernoulli distribution, as opposed to a normal sampling model, and a logit link instead of an identity link (Guo & Zhao, 2000; Raudenbush & Bryk, 2002). To properly model the relationship between variables in a bi-level model, the traffic stop variables would be included at level 1 and the station characteristics (i.e., aggregated Trooper characteristics) would be included at level 2. Due to confidentiality restrictions, it is not possible to locate each traffic stop within a PSP station and link that information with a specific Trooper. Therefore, Trooper characteristics are included in the bi-level model at level 1.

[12] Technically, this odds ratio is a form of log-odds but the interpretation of this value is not intuitively straightforward; therefore, this type of coefficient is usually exponentiated to allow for interpretation in terms of odds (Liao, 1994). The odds ratio represents this antilog transformation of the coefficient into the multiplicative odds of the outcome variable based on the predictor variable, all being equal.

[13] For negative relationships, the odds ratio is presented as 1/Exp(b), for easier interpretation.

Multivariate Findings

Tables 6.4 & 6.5 display the results of four separate bi-level multivariate models that predict warnings, citations, arrests, and searches, respectively. These models demonstrate which factors influenced whether a particular traffic stop outcome was issued, other factors being equal. For each of these models, multiple independent variables were included that could potentially influence officers' actions. It is believed that each of these variables has the potential to influence officer behavior, and therefore must be statistically controlled to examine the variables of interest (i.e., drivers' race/ethnicity).[14] As shown in the left hand column of Tables 6.4 & 6.5, the predictor variables at Level 1 included:

- Driver characteristics (values for each variable are in parentheses):
    - Race/ethnicity (four dichotomous variables: White, Black, Hispanic, other; White is the excluded comparison category in the analyses)
    - Gender (0 = female; 1 = male)
    - Age (in years)
    - County residency where stop occurred (0 = no; 1 = yes)
    - Pennsylvania residency (0 = no; 1 = yes)
- Vehicle characteristics:
    - Vehicle registration (1 = PA registration; 0 = out-of-state registration)
    - Number of passengers in the vehicle (range = 0-5)
- Stop characteristics:
    - Daytime (0 = nighttime; 1 = daytime)
    - Rush hour (0 = no; 1= rush hour)
    - Weekday (0 = weekend; 1 = weekday)
    - Summer (0 = January – May & September – December; 1 = June, July & August)
    - Interstate (0 = state road, county road, other; 1 = interstate)
- Legal variables:
    - Reason for the stop (0 = other moving violations, equipment violations, pre-existing information, registration violations, license violations, special traffic enforcement programs, and "other" reasons not previously indicated; 1 = speeding)
    - Number of reasons for the stop (range = 1 - 6)
    - Evidence found during a search (0 = no evidence; 1 = any evidence)
- Trooper characteristics:
    - Gender (0 = female; 1 = male)
    - Race/ethnicity (0 = Non-White; 1 = White)
    - Experience (0 = more than 5 years experience; 1 = less than 5 years)

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[14] Some variables were excluded from the models for comparison purposes. For example, drivers' race was captured in the model as Black, Hispanic, and "other." The "other" category included Native American, Asian/Pacific Islander, and Middle Eastern. White was excluded from the model for comparison purposes. The effects of race/ethnicity variables reported in the models are *in comparison to* Whites. For examples, the odds ratio represents the likelihood of a Black driver being issued a citation compared to a White driver. The other dichotomous variables in the models were simply compared against their opposite (e.g., male drivers compared to female drivers).

o Education (range 1-6: 1 = high school, 2 = some college, no degree, 3 = Associate's degree, 4 = 4 year degree, 5 = 1-2 years graduate level, 6 = > 2 years graduate level)
o Assignment (0 = non-Patrol; 1 = Patrol)

Warnings

As reported in Table 6.4, the results of the bi-level model for warnings indicated that *Black and Hispanic drivers showed no statistically significant differences in the likelihood of being warned compared to Whites*. Drivers of "other" race/ethnicity were 1.2 times less likely to be warned compared to White drivers. Although this racial/ethnic difference is statistically significant, the strength of this relationship indicates that it is not substantively important. Similarly, although driver age and residency also show statistically significant relationships with the likelihood of receiving a warning, their small odds ratios indicate marginal substantive significance.

Bi-level analyses of warnings also indicated that traffic stops initiated during the daytime were 1.2 times less likely to result in a warning compared to traffic stop initiated in non-daytime hours. Stops occurring on a weekday and in the summer were 1.1 and 1.2 times more likely to result in a warning compared to a traffic stop occurring on a weekend and non-summer months. Again, however, these statistically significant findings are substantively unimportant.

The strongest predictors of the likelihood of receiving a warning during a traffic stop were the legal variables. Specifically, traffic stops initiated as a result of speeding were 2.0 times less likely to result in a warning compared to traffic stops initiated for non-speeding reasons. Conversely, for each additional reason for the stop, the likelihood of a warning increased 4.3 times.

Finally, the only Trooper characteristic that achieved statistical significance was patrol assignment. Based on the bi-level models, Troopers assigned to patrol were 1.8 times less likely to issue a warning compared to Troopers not assigned to patrol.

Collectively, these results suggest slight racial/ethnic differences in the likelihood of receiving warnings, but indicate that Troopers' decisions to issue warnings are most strongly based on legal factors rather than driver or Trooper characteristics.

Table 6.4: HLM Analyses Predicting WARNINGS and CITATIONS during all Traffic Stops in 2009

Level 1 Variables (N=295,500) Level 2 Variables (N=90)	Model 1: Warning		Model 2: Citation	
	Coefficient	Odds Ratio	Coefficient	Odds Ratio
Intercept	-1.82*		0.54	
Driver Characteristics				
Black	0.11	--	-0.13	--
Hispanic	-0.03	--	0.04	--
Other Race	-0.20*	1.22	0.28*	1.32
Male	-0.04	--	0.08*	1.08
Age	0.00*	1.00	-0.02*	1.02
County resident	0.11*	1.11	-0.14*	1.15
PA resident	0.11*	1.11	0.01	--
Vehicle Characteristics				
PA registration	0.10	--	-0.07	--
Number of Passengers	0.02	--	0.00	--
Stop Characteristics				
Daytime	-0.17*	1.18	0.47*	1.60
Rush hour	-0.02	--	0.08*	1.08
Weekday	0.13*	1.13	-0.04	--
Summer	0.18*	1.20	-0.36*	1.43
Interstate	-0.12	--	0.15	--
Legal variables				
Speeding is reason for the stop	-0.69*	2.00	0.99*	2.70
Number of reasons for stop	1.47*	4.33	0.43*	1.54
Evidence found during search	-0.47	--	-1.55*	4.70
Trooper variables				
Male	-0.04	--	-0.17	--
White	-0.10	--	-0.11	--
Less than 5 years experience	0.08	--	0.18	--
Education scale	0.02	--	-0.03	--
Patrol assignment	-0.58*	1.78	1.10*	2.99

NOTE: * p ≤ .0001
The log odds for negative coefficients is calculated as 1/exp(b).

Citations

Table 6.4 also identifies statistically significant variables related to the likelihood of receiving a citation. *Black and Hispanic drivers were equally likely to be cited compared to White drivers in similar situations.* In contrast, drivers of "other" race/ethnicity and male drivers were 1.3 and 1.1 times more likely to be cited compared to White drivers and female drivers, respectively. Drivers' age and county residency were also statistically significant predictors of the likelihood of receiving citations, but in a negative direction (younger drivers and drivers who did not reside in the county in which they were stopped were more likely to be cited).

Other findings include: traffic stops initiated during daytime hours and rush hour were 1.6 and 1.1 times more likely to result in a citation compared to non-daytime and non-rush hour traffic stops; traffic stops for speeding were 2.7 times more likely to result in a citation compared to non-speeding based traffic stops; the likelihood of being cited increased 1.5 times for every additional reason for the stop; and traffic stops resulting in the discovery of contraband were 4.7 times <u>less</u> likely to result in a citation compared to traffic stops in which no contraband was discovered (but more likely to result in arrest, see Table 6.5). Finally, traffic stops initiated by Troopers assigned to a patrol function were 3.0 times more likely to result in citations compared to traffic stops initiated by non-patrol assigned Troopers.

Collectively, these results demonstrate that Troopers' decisions to issue citations are most often based on legal factors and not drivers' or Troopers' characteristics.

Arrests

A third bi-level model was computed for arrests and reported in Table 6.5. For arrests, there were no statistically significant racial differences for Black and Hispanic drivers when other factors were simultaneously considered. In other words, Black and Hispanic drivers were equally likely as White drivers to be arrested given similar circumstances surrounding the traffic stop. *Therefore, even though the rates of arrests were higher for Black and Hispanic drivers compared to Whites, once the factors associated with the traffic stops were considered, there were no racial/ethnic disparities in arrests.* In contrast, drivers of "other" race/ethnicity were 1.8 times <u>less</u> likely to be arrested compared to White drivers. Male drivers were 1.6 times more likely to be arrested compared to female drivers in similar situations. Drivers that lived in the county where the traffic stop occurred were 1.4 times *more* likely to be arrested compared to non-county.

Stop characteristics were also associated with arrest. As reported in Table 6.5, traffic stops initiated during the daytime, during rush hour, on a weekday, or on the interstate were all <u>less</u> likely to result in an arrest compared to non-daytime, non-rush hour, weekend, and non-interstate traffic stops. Daytime traffic stops were the strongest of these variables, as they were 9.7 times less likely to result in an arrest. Rush hour, weekday, and interstate traffic stops were 2.1, 2.2, and 1.8 times less likely to end in an arrest, respectively.

All three legal variables measured were statistically related to arrests. By a significant margin, traffic stops resulting in the discovery of contraband were more likely to end in an arrest (over 288 times more likely). Traffic stops initiated due to speeding were 4.4 times *less* likely to end in an arrest compared to non-speeding traffic stops, while the likelihood of arrest increased 1.6 times for each additional reason for the stop. No Trooper characteristics were significant predictors of the likelihood of arrest.

Collectively, these results demonstrate that the most severe sanction issued during traffic stops (i.e., arrests) is based on legal factors and not drivers' race/ethnicity, or Trooper characteristics.

Table 6.5: HLM Analyses Predicting ARRESTS and SEARCHES during all Traffic Stops in 2009

Level 1 Variables (N=295,500) Level 2 Variables (N=90)	Model 1: Arrest		Model 2: Search	
	Coefficient	Odds Ratio	Coefficient	Odds Ratio
Intercept	-4.38*		-3.88*	
Driver Characteristics				
Black	0.22	--	1.02*	2.78
Hispanic	0.31	--	0.83*	2.30
Other Race	-0.57*	1.77	-0.62	--
Male	0.48*	1.61	0.92*	2.50
Age	0.00	--	-0.04*	1.04
County resident	0.32*	1.38	0.12	--
PA resident	0.29	--	-0.06	--
Vehicle Characteristics				
PA registration	0.10	--	-0.32*	1.38
Number of Passengers	-0.13*	1.14	0.07*	1.07
Stop Characteristics				
Daytime	-2.27*	9.70	-0.57*	1.77
Rush hour	-0.72*	2.06	-0.22*	1.24
Weekday	-0.77*	2.16	0.02	--
Summer	0.13	--	0.08	--
Interstate	-0.59*	1.80	0.24*	--
Legal variables				
Speeding is reason for the stop	-1.48*	4.41	-1.42*	4.15
Number of reasons for stop	0.45*	1.56	0.73*	2.08
Evidence found during search	5.67*	288.88	--	--
Trooper variables				
Male	0.42	--	0.38	--
White	0.35	--	0.08	--
Less than 5 years experience	-0.09	--	-0.01	--
Education scale	0.03	--	0.06	--
Patrol assignment	0.03	--	-1.01*	2.74

NOTE: * $p \leq .0001$
The log odds for negative coefficients is calculated as 1/exp(b).

Searches

In Table 6.5, the bi-level model examining searches is reported. In contrast to the previous models predicting citations and arrests, racial/ethnic differences were identified. *Specifically, Black drivers were 2.8 times more likely to be searched compared White drivers. Likewise, Hispanic drivers were 2.3 times more likely than White drivers to be searched. These differences existed even after controlling for other measured legal and extralegal factors.* In addition, male drivers were 2.5 times more likely to be searched compared to female drivers. Finally, younger drivers were slightly more likely to be searched, but the substantive effect of this relationship is marginal.

Traffic stops involving vehicles with Pennsylvania registration were 1.4 times less likely to result in a search compared to traffic stops involving vehicles with out-of-state registration, and there was a slightly higher likelihood of search if there were more passengers in the vehicle. Traffic stops initiated during the daytime and rush hour were 1.8 and 1.2 times *less* likely to result in a search compared to traffic stops initiated during nighttime hours and non-rush hours, respectively.

Similar to arrests, traffic stops initiated due to speeding were 4.2 times *less* likely to result in searches compared to traffic stops initiated for non-speeding reasons. Conversely, the likelihood of a search increased 2.1 times for every additional reason for the stop noted on the form (i.e., multiple reasons for the stop were more likely to result in searches). Finally, traffic stops initiated by Troopers assigned to a patrol function were 2.7 times *less* likely to conduct searches compared to traffic stops initiated by Troopers not assigned to patrol.

Collectively, these results demonstrate that racial/ethnic differences in the rates of searches cannot be explained by the legal and extralegal factors captured on the traffic stop forms. Given similar situations (as measured on the traffic stop form), Black and Hispanic drivers are significantly more likely to be searched compared to White drivers. More detailed analyses examining searches and seizures are provided in Section 7.

SECTION SUMMARY

This summary highlights the bivariate and multivariate analyses of warnings, citations, arrests, and searches issued to drivers during member-initiated traffic stops conducted in 2009. When reviewing these results, it is important to remember that the bivariate analyses only consider two variables at a time (e.g., the race/ethnicity of the driver or the drivers' gender and the traffic stop outcome). As a result, the interpretation of these findings should be made with caution and cannot determine the existence of racial bias. The multivariate analyses are better suited to make substantive claims about the results of post-stop outcomes due to their consideration of more than one factor simultaneously. Nevertheless, the multivariate analyses are limited by the type and amount of data collected. Conclusions based on any multivariate analyses are limited to the variables in the model, and do not consider the potential of a misspecified model. Misspecified models occur when important, pertinent variables related to the dependent variables are not included in the model. Thus, multivariate analyses can only demonstrate racial/ethnic disparities that exist after statistically controlling for other factors that might influence officer decision making that are measured with these data.

Bivariate Analysis
- At the department level, racial/ethnic and gender based statistically significant differences were noted for warnings, citations, arrests, and searches
  - Warnings:
    - Of the Hispanic and Black motorists stopped, 29.5% and 30.0%, respectively, received warnings compared to 28.5% of White drivers stopped.
    - The difference between male and female drivers for warnings, although statistically significant, was very small.
  - Citations:
    - Conversely, Hispanic drivers had slightly higher rates of citations (88.9%), compared to White (86.2%) and Black (87.8%) drivers.
    - Unlike previous years, but like the 2008 results, there were no statistically significant differences between male and female drivers on the rates of citations.
  - Arrests:
    - Arrest rates also showed statistically significant racial/ethnic disparities, as White drivers were arrested during 1.4% of stops, while Black and Hispanic drivers were arrested during 1.8% and 2.4% of stops, respectively.
    - Male drivers were arrested more frequently (1.7% of male drivers stopped) compared to female drivers (0.9%).
  - Searches:
    - The largest differences across racial/ethnic groups were found for searches.
    - Of all Black and Hispanic drivers stopped, 3.4% and 3.3% resulted in searches for these racial groups, compared to only 0.8% of White drivers stopped.
    - Male drivers (1.4%) were searched more frequently compared to female drivers (0.4%).
- These patterns and trends varied somewhat at the area level and more so at the troop and station levels.

- Racial, ethnic, and gender differences alone are not evidence of bias-based policing because other factors related to traffic stop outcomes were not considered in these analyses.
- PSP supervisors should review these findings for the best understanding of trends in racial/ethnic and gender disparities in stop outcomes within their jurisdictions.

Multivariate Analyses

- Multivariate statistical models take many different factors into account when attempting to explain traffic stop outcomes. Unlike a bivariate model, they do not simply assess the relationship between two variables. Rather, multivariate models examine many variables simultaneously, and therefore provide a more thorough and accurate interpretation of the data. The findings summarized below represent the independent effects on traffic stop outcomes when other factors are statistically controlled.

- **Warnings**
  - *Black and Hispanic drivers showed no statistically significant differences in the likelihood of being warned compared to Whites.*
  - Drivers of "other" race/ethnicity were 1.2 times *less* likely to be warned compared to White drivers.
  - Traffic stops initiated as a result of speeding were 2.0 times *less* likely to result in a warning compared to traffic stops initiated for other non-speeding reasons.
  - For each additional reason for the stop (traffic infraction), the likelihood of a warning *increased* 4.3 times.
  - Troopers assigned to patrol were 1.8 times less likely to issue a warning compared to Troopers not assigned to patrol.

Collectively, these results suggest slight, but substantively unimportant, racial/ethnic differences in the likelihood of receiving warnings, but indicate that Troopers' decisions to issue warnings are most strongly based on legal factors rather than driver or Trooper characteristics.

- **Citations**
  - Black and Hispanic drivers were *equally likely* to be cited compared to White drivers in similar situations.
  - Drivers of "other" race/ethnicity were 1.3 times more likely to be cited, compared to White drivers.
  - Male drivers were 1.1 times *more* likely to be cited compared to female drivers.
  - Younger drivers were *more* likely to be cited compared to older drivers.
  - Traffic stops initiated during daytime hours were 1.6 times *more* likely to result in a citation.
  - Traffic stops initiated due to speeding were 2.7 times *more* likely to result in a citation compared to stops initiated for non-speeding reasons.
  - The likelihood of being cited *increased* 1.5 times for every additional reason for the stop.

- o Traffic stops resulting in the discovery of contraband were 4.7 times *less* likely to result in a citation compared to stops with contraband discoveries (but more likely to result in arrest).
- o Traffic stops initiated by Troopers assigned to a patrol function were 3.0 times more likely to result in citations compared to traffic stops initiated by non-patrol assigned Troopers.

Collectively, these results demonstrate that Troopers' decisions to issue citations are most often based on legal factors and not drivers' or Troopers' characteristics.

- **Arrests**
  - o There were no statistically significant racial differences for Black and Hispanic drivers when other factors were simultaneously considered. In other words, Black and Hispanic drivers were equally likely as White drivers to be arrested given similar circumstances surrounding the traffic stop.
  - o Drivers of "other" race/ethnicity were 1.8 times <u>less</u> likely to be arrested compared to White drivers.
  - o Male drivers were 1.6 times more likely than female drivers to be arrested.
  - o Drivers that lived in the county where the traffic stop occurred were 1.4 times more likely to be arrested compared to non-county.
  - o Stop characteristics were also associated with arrest. Traffic stops initiated during the daytime, during rush hour, on a weekday, or on the interstate were all <u>less</u> likely to result in an arrest compared to non-daytime, non-rush hour, weekend, and non-interstate traffic stops.
  - o Traffic stops resulting in the discovery of contraband were over 288 times *more* likely to end in arrest compared to traffic stops without contraband discoveries.
  - o Traffic stops initiated due to speeding were 4.4 times *less* likely to end in arrests compared to stops initiated for other reasons.
  - o The likelihood of arrest *increased* 1.6 times for each additional reason for the stop.
  - o No Trooper characteristics were significant predictors of the likelihood of arrest.

Collectively, these results demonstrate that the most severe sanction issued during traffic stops (i.e., arrest) is based on legal factors and not drivers' race/ethnicity, or Troopers' characteristics.

- **Searches**
  - o Black and Hispanic drivers were 2.8 and 2.3 times *more* likely to be searched compared to White drivers, respectively.
  - o Male drivers were 2.5 times *more* likely to be searched compared to female drivers.
  - o Younger drivers were slightly *more* likely to be searched compared to older drivers, but the substantive effect of this relationship is marginal.
  - o Traffic stops involving vehicles with Pennsylvania registration were 1.4 times less likely to result in a search compared to traffic stops involving vehicles with out-

of-state registration, and there was a slightly higher likelihood of search if there were more passengers in the vehicle.

- o Traffic stops initiated during the daytime and rush hour were 1.8 and 1.2 times *less* likely to result in a search compared to traffic stops initiated during nighttime hours and non-rush hours, respectively.
- o Traffic stops initiated due to speeding were 4.2 times *less* likely to result in searches compared to traffic stops initiated for non-speeding reasons.
- o The likelihood of a search increased 2.1 times for every additional reason for the stop noted on the form.
- o Traffic stops initiated by Troopers assigned to a patrol function were 2.7 times *less* likely to conduct searches compared to traffic stops initiated by Troopers not assigned to patrol.

Collectively, these results demonstrate that racial/ethnic differences in the rates of searches cannot be explained by the legal and extralegal factors captured on the traffic stop forms. Given similar situations (as measured on the traffic stop form), Black and Hispanic drivers are significantly more likely to be searched compared to White drivers.

7. SEARCH AND SEIZURE

OVERVIEW

The material presented in this section focuses specifically on motor vehicle and person searches conducted during traffic stops, and subsequent seizures of contraband. As reported in Section 6, searches are the only post-stop outcomes conducted by PSP Troopers that have unexplained racial and ethnic disparities. After statistically controlling for some of the other relevant legal and extralegal factors, Black and Hispanic drivers were approximately 2.8 and 2.3 times more likely than Whites to be searched. The purpose of the analyses presented in this section is to further examine searches and seizures conducted by PSP Troopers. The descriptive statistics for the search and seizure rates of the department, areas, troops, and stations are presented in an earlier section of this report (see Section 3, Tables 3.8 and 3.9).

Tables 7.1 and 7.2 present the different types of searches conducted at the department, area, troop, and station levels. For additional analyses, the types of searches are collapsed into three categories: Type I (mandatory), Type II (probable cause/reasonable suspicion), and Type III (consent). Using these three search types, Table 7.3 documents the search rates for different types of drivers and Troopers. Tables 7.4 and 7.5 report the different types of contraband seized by department, area, troop, and station, while Tables 7.6 – 7.9 report search success rates. Finally, Tables 7.10 – 7.12 present a series of analyses focused specifically on consent searches. This section concludes with a summary of the main findings on PSP's search and seizure rates.

SEARCH RATES

As reported in Sections 3 and 5, 1.1% of all member-initiated traffic stops during the one-year period under review resulted in a search of the vehicle and/or driver. Despite the statistical infrequency with which PSP Troopers conduct searches, the physical and psychological intrusion of a person or vehicle search merits further scrutiny of this type of coercive police action.

TYPES OF SEARCHES

Table 7.1 documents the number of searches and the percentage of searches for each reason indicated on the Contact Data Report (e.g., incident to arrest, inventory, warrant, plain view, canine alert, drug odor, consent, reasonable suspicion/probable cause, and other) by department, area, and troop. Troopers may have indicated that a search was conducted for multiple reasons. As a result, the sum of percentages across search categories reported in Table 7.1 may exceed 100%. In addition, the last column in Table 7.1 indicates the percentage of searches that were conducted based *only* on drivers' consent. This column partially duplicates information provided in the "consent" column, but excludes searches that were conducted based on consent in addition to another reason. Although specific information regarding the reason for the search is provided at the station level in Table 7.2, due to the small number of searches conducted in many stations, these percentages need to be interpreted with caution.

As shown in Table 7.1, 62.9% of drivers gave their consent to be searched at the department level in 2009. A smaller percentage of searched drivers, however, were searched based *solely* on consent (32.7%). This is consistent with data from previous years that also indicated consent

was the most common reason for searches during traffic stops. The second most frequently recorded reason for a search was inventory (24.5% of searches), followed by incident to arrest (18.5%), the odor of drugs (16.8%), reasonable suspicion or probable cause (9.1%), plain view (7.9%), canine alerts (1.8%), and search warrant (1.1%). For 8.5% of searches, the "other" category was indicated as the reason for the search. The exact reasons for "other," however, are unknown.

Table 7.1 also illustrates the different reasons for searches across areas and troops. For example, 85.5% of searches conducted in the Bureau of Patrol were based on consent, compared to only 50.0% of searches conducted in Area I. Over 40% of searches in Area I were based on vehicle inventory, while this reason accounted for approximately 10% or less of the searches in all other areas. At the troop level, over 80% of the searches in Troops N, P, G, and T were based on consent, compared to less than half of the searches in Troops K, L, and M. Similar variation in reasons for searches is evident at the station level (shown in Table 7.2) but comparisons of the percentages in this table should be interpreted cautiously due to the small number of searches in many stations.

Table 7.1: Reasons for Search by Department, Area, and Troop

	# of Searches	% Incident to Arrest	% Inventory	% Search Warrant	% Plain View	% Canine Alert	% Drug Odor	% Consent	% Reas. Susp./ Prob. Cause	% Other	% Consent Only
PSP Dept.	3,414	18.5	24.5	1.1	7.9	1.8	16.8	62.9	9.1	8.5	32.7
AREA I	1,605	19.8	42.9	0.4	4.7	0.9	11.7	50.0	5.3	6.0	26.5
Troop J	296	27.7	38.5	0.7	8.1	1.0	17.2	48.0	5.7	6.4	15.9
Troop K	958	15.9	45.2	0.2	3.9	0.3	10.0	53.1	4.5	5.0	31.7
Troop L	81	38.3	30.9	0.0	2.5	2.5	17.3	29.6	9.9	7.4	17.3
Troop M	270	19.3	43.3	1.1	4.4	2.6	10.0	47.0	6.3	8.9	22.2
AREA II	451	16.0	10.4	2.0	5.1	1.8	16.4	79.2	7.8	13.5	40.6
Troop F	155	30.3	9.7	3.9	7.7	3.2	21.3	79.4	10.3	12.3	27.1
Troop N	103	6.8	8.7	1.9	3.9	1.9	17.5	82.5	8.7	15.5	43.7
Troop P	54	9.3	13.0	0.0	3.7	0.0	9.3	81.5	3.7	7.4	64.8
Troop R	139	9.4	11.5	0.7	3.6	0.7	12.9	75.5	5.8	15.8	43.9
AREA III	641	19.2	6.9	0.9	15.3	1.4	20.4	65.7	13.7	8.9	36.0
Troop A	174	17.8	6.9	1.1	24.1	1.1	13.2	50.6	8.6	9.8	26.4
Troop G	184	12.0	2.7	2.2	8.2	2.2	16.8	83.2	12.0	10.3	47.3
Troop H	283	24.7	9.5	0.0	14.5	1.1	27.2	63.6	18.0	7.4	34.6
AREA IV	533	18.4	6.9	1.5	11.8	2.8	26.5	77.7	13.3	11.8	36.8
Troop C	64	12.5	0.0	0.0	9.4	4.7	15.6	71.9	12.5	20.3	35.9
Troop D	221	20.4	12.2	3.2	15.8	4.1	31.7	78.3	17.2	7.2	33.9
Troop E	108	15.7	0.9	0.9	6.5	2.8	23.1	78.7	10.2	19.4	38.0
Troop B	140	20.0	6.4	0.0	10.7	0.0	25.7	78.6	10.0	9.3	40.7
Bureau of Patrol	179	11.7	10.1	4.5	6.1	8.4	22.9	85.5	16.8	6.7	41.9
Troop T	179	11.7	10.1	4.5	6.1	8.4	22.9	85.5	16.8	6.7	41.9

Table 7.2: Reasons for Search by Station (p. 1 of 4)

	# of Searches	% Incident to Arrest	% Inventory	% Search Warrant	% Plain View	% Canine Alert	% Drug Odor	% Consent	% Reas. Susp./ Prob. Cause	% Other	% Consent Only
AREA I											
Troop J											
Avondale	126	16.7	31.0	0.0	11.1	0.0	20.6	57.1	4.0	8.7	20.6
Embreeville	81	33.3	59.3	1.2	2.5	0.0	11.1	30.9	7.4	2.5	11.1
Ephrata	24	25.0	29.2	0.0	4.2	4.2	29.2	54.2	4.2	4.2	8.3
Lancaster	65	43.1	30.8	1.5	10.8	3.1	13.8	49.2	7.7	7.7	15.4
Troop K											
Media	352	13.4	34.9	0.3	6.8	0.9	9.9	61.9	1.4	8.2	37.8
Philadelphia	487	12.5	53.6	0.0	1.6	0.0	6.2	50.3	3.9	2.7	31.5
Skippack	119	37.0	41.2	0.8	4.2	0.0	26.1	38.7	16.0	5.0	14.3
Troop L											
Frackville	15	86.7	0.0	0.0	6.7	0.0	26.7	0.0	0.0	13.3	0.0
Hamburg	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
Jonestown	38	47.4	15.8	0.0	0.0	5.3	26.3	52.6	15.8	2.6	26.3
Reading	22	0.0	86.4	0.0	0.0	0.0	0.0	0.0	9.1	9.1	0.0
Schuylkill Haven	5	0.0	0.0	0.0	20.0	0.0	0.0	80.0	0.0	20.0	60.0
Troop M											
Belfast	27	11.1	44.4	0.0	3.7	0.0	11.1	74.1	0.0	3.7	33.3
Bethlehem	35	11.4	60.0	0.0	2.9	5.7	11.4	28.6	5.7	2.9	14.3
Dublin	64	17.2	35.9	1.6	10.9	1.6	14.1	56.3	3.1	14.1	18.8
Fogelsville	82	14.6	50.0	1.2	2.4	4.9	6.1	45.1	12.2	11.0	19.5
Trevose	62	35.5	32.3	1.6	1.6	0.0	9.7	38.7	4.8	6.5	29.0
AREA II											
Troop F											
Coudersport	11	9.1	0.0	0.0	9.1	0.0	9.1	72.7	0.0	27.3	54.5
Emporium	0	--	--	--	--	--	--	--	--	--	--
Lamar	15	6.7	26.7	0.0	0.0	13.3	20.0	60.0	33.3	26.7	6.7
Mansfield	13	0.0	0.0	7.7	23.1	0.0	7.7	0.0	23.1	0.0	46.2
Milton	10	80.0	0.0	0.0	10.0	0.0	20.0	90.0	10.0	0.0	0.0
Montoursville	55	25.5	14.5	7.3	9.1	5.5	14.5	80.0	7.3	14.5	40.0

Table 7.2: Reasons for Search by Station (p. 2 of 4)

	# of Searches	% Incident to Arrest	% Inventory	% Search Warrant	% Plain View	% Canine Alert	% Drug Odor	% Consent	% Reas. Susp./ Prob. Cause	% Other	% Consent Only
AREA II (cont.)											
Selinsgrove	13	0.0	7.7	0.0	7.7	0.0	7.7	84.6	15.4	23.1	38.5
Stonington	38	60.5	5.3	2.6	2.6	0.0	44.7	76.3	2.6	2.6	5.3
Troop N											
Bloomsburg	4	0.0	0.0	0.0	25.0	0.0	50.0	0.0	0.0	25.0	25.0
Fern Ridge	7	0.0	0.0	0.0	0.0	14.3	14.3	85.7	14.3	28.6	42.9
Hazleton	28	14.3	10.7	0.0	7.1	3.6	21.4	82.1	7.1	28.6	28.6
Lehighton	22	9.1	27.3	0.0	0.0	0.0	18.2	59.1	18.2	9.1	18.2
Swiftwater	42	2.4	0.0	4.8	2.4	0.0	11.9	9.2	4.8	7.1	69.0
Troop P											
Laporte	18	11.1	5.6	0.0	5.6	0.0	5.6	88.9	0.0	5.6	72.2
Shickshinny	0	--	--	--	--	--	--	--	--	--	--
Towanda	34	8.8	17.6	0.0	2.9	0.0	8.8	76.5	2.9	5.9	64.7
Tunkhannock	0	--	--	--	--	--	--	--	--	--	--
Wyoming	2	0.0	0.0	0.0	0.0	0.0	50.0	0.0	50.0	50.0	0.0
Troop R											
Blooming Grove	42	16.7	14.3	0.0	2.4	0.0	19.0	71.4	2.4	14.3	35.7
Dunmore	33	9.1	15.2	0.0	9.1	3.0	12.1	54.5	0.0	24.2	33.3
Gibson	37	2.7	13.5	2.7	0.0	0.0	5.4	86.5	10.8	8.1	62.2
Honesdale	27	7.4	0.0	0.0	3.7	0.0	14.8	92.6	11.1	18.5	44.4
AREA III											
Troop A											
Ebensburg	14	0.0	0.0	0.0	7.1	0.0	7.1	78.6	14.3	21.4	50.0
Greensburg	43	4.7	2.3	2.3	4.7	2.3	11.6	79.1	14.0	14.0	53.5
Indiana	24	20.8	8.3	0.0	4.2	4.2	20.8	58.3	0.0	16.7	33.3
Kiski Valley	79	22.8	6.3	1.3	46.8	0.0	10.1	27.8	3.8	5.1	8.9
Somerset (A)	14	42.9	28.6	0.0	7.1	0.0	28.6	50.0	28.6	0.0	7.1

Table 7.2: Reasons for Search by Station (p. 3 of 4)

	# of Searches	% Incident to Arrest	% Inventory	% Search Warrant	% Plain View	% Canine Alert	% Drug Odor	% Consent	% Reas. Susp./ Prob. Cause	% Other	% Consent Only
AREA III (cont.)											
Troop G											
Bedford	51	3.9	2.0	0.0	3.9	2.0	2.0	80.4	7.8	13.7	68.6
Hollidaysburg	15	20.0	0.0	0.0	6.7	0.0	20.0	86.7	6.7	0.0	66.7
Huntingdon	22	27.3	0.0	4.5	4.5	4.5	31.8	63.6	31.8	13.6	9.1
Lewistown	33	0.0	3.0	9.1	9.1	6.1	27.3	87.9	3.0	6.1	51.5
McConnellsburg	35	5.6	2.8	0.0	13.9	0.0	13.9	97.2	11.1	16.7	44.4
Philipsburg	1	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0
Rockview	26	30.8	7.7	0.0	11.5	0.0	23.1	76.9	19.2	3.8	26.9
Troop H											
Carlisle	101	37.6	5.9	0.0	26.7	2.0	34.7	49.5	25.7	2.0	20.8
Chambersburg	35	2.9	8.6	0.0	11.4	0.0	17.1	82.9	0.0	5.7	62.9
Gettysburg	35	62.9	5.7	0.0	17.1	0.0	68.6	31.4	42.9	2.9	11.4
Harrisburg	25	0.0	32.0	0.0	4.0	4.0	8.0	64.0	8.0	8.0	40.0
Lykens	27	22.2	7.4	0.0	3.7	0.0	22.2	88.9	7.4	11.1	44.4
Newport	14	0.0	14.3	0.0	0.0	0.0	7.1	85.7	0.0	14.3	64.3
York	46	6.5	8.7	0.0	4.3	0.0	6.5	82.6	13.0	19.6	43.5
AREA IV											
Troop C											
Clarion	16	0.0	0.0	0.0	6.3	0.0	18.8	81.3	6.3	18.8	50.0
Clearfield	12	0.0	0.0	0.0	16.7	16.7	8.3	83.3	25.0	8.3	33.3
Dubois	6	50.0	0.0	0.0	0.0	0.0	0.0	33.3	16.7	16.7	16.7
Kane	6	33.3	0.0	0.0	33.3	0.0	50.0	50.0	0.0	16.7	0.0
Punxsutawney	15	13.3	0.0	0.0	6.7	0.0	13.3	93.3	13.3	6.7	60.0
Ridgway	7	0.0	0.0	0.0	0.0	0.0	0.0	28.6	0.0	85.7	14.3
Tionesta	2	50.0	0.0	0.0	0.0	50.0	50.0	0.0	50.0	0.0	0.0
Troop D											
Beaver	20	25.0	0.0	5.0	0.0	20.0	55.0	85.0	10.0	5.0	15.0
Butler	39	15.4	2.6	0.0	10.3	0.0	20.5	79.5	10.3	20.5	33.3
Kittanning	82	31.7	31.7	4.9	32.9	1.2	39.0	63.4	29.3	3.7	17.1
Mercer	49	4.1	0.0	0.0	0.0	6.1	26.5	93.9	2.0	6.1	63.3

Table 7.2: Reasons for Search by Station (p. 4 of 4)

	# of Searches	% Incident To Arrest	% Inventory	% Search Warrant	% Plain View	% Canine Alert	% Drug Odor	% Consent	% Reas. Susp./ Prob. Cause	% Other	% Consent Only
AREA IV (cont.)											
New Castle	31	19.4	0.0	6.5	12.9	3.2	19.4	87.1	22.6	3.2	45.2
Troop E											
Corry	8	75.0	12.5	0.0	25.0	0.0	37.5	37.5	12.5	12.5	0.0
Erie	42	4.8	0.0	2.4	2.4	2.4	7.1	83.3	7.1	19.0	64.3
Franklin	10	10.0	0.0	0.0	10.0	0.0	20.0	90.0	0.0	10.0	60.0
Girard	12	8.3	0.0	0.0	0.0	8.3	0.0	91.7	8.3	50.0	25.0
Meadville	27	22.2	0.0	0.0	3.7	3.7	63.0	77.8	22.2	3.7	11.1
Warren	9	11.1	0.0	0.0	22.2	0.0	0.0	66.7	0.0	44.4	22.2
Troop B											
Belle Vernon	9	22.2	22.2	0.0	0.0	0.0	22.2	88.9	11.1	11.1	33.3
Pittsburgh	21	28.6	14.3	0.0	23.8	0.0	52.4	61.9	28.6	14.3	14.3
Uniontown	72	22.2	1.4	0.0	9.7	0.0	22.2	77.8	5.6	5.6	43.1
Washington	26	15.4	11.5	0.0	7.7	0.0	15.4	84.6	7.7	11.5	50.0
Waynesburg	12	0.0	0.0	0.0	8.3	0.0	25.0	91.7	8.3	16.7	58.3
Bureau of Patrol											
Troop T											
Bowmansville	48	4.2	8.3	8.3	2.1	12.5	29.2	89.6	14.6	4.2	50.0
Everett	22	13.6	0.0	4.5	9.1	4.5	13.6	86.4	27.3	4.5	50.0
Gibsonia	6	0.0	0.0	0.0	0.0	0.0	16.7	100.0	16.7	0.0	66.7
Highspire	1	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	100.0
King of Prussia	44	25.0	27.3	0.0	6.8	0.0	20.5	68.2	6.8	2.3	29.5
New Stanton	18	11.1	0.0	16.7	22.2	33.3	55.6	100.0	50.0	0.0	5.6
Newville	18	0.0	0.0	0.0	0.0	0.0	11.1	100.0	0.0	5.6	83.3
Pocono	14	14.3	7.1	0.0	0.0	7.1	7.1	78.6	7.1	35.7	28.6
Somerset (T)	8	12.5	12.5	0.0	12.5	12.5	12.5	87.5	37.5	25.0	25.0

While examining the specific reasons for searches is instructive, this information is better analyzed when collapsed into discrete categories or types of searches. For the analyses reported in Table 7.3 below, searches were divided into three categories based on the presumed level of officer discretion for different situations. The first search category (Type I) includes searches that are required by PSP policy and are therefore mandatory for Troopers to perform. Type I searches include searches incident to arrest, searches based on a pre-existing warrant, and inventory searches. The second search category (Type II) includes searches that are not mandatory but, rather, are based on suspicion and officer discretion. Specifically, Type II searches include plain view searches, canine alert searches, drug odor searches, reasonable suspicion, probable cause, and "other" unspecified reasons. The third search category (Type III) includes searches that are based solely on consent.[15] If a search was based on multiple reasons, it was assigned to the search category with the least officer discretion (e.g., if a search is based on a canine alert [Type II] and consent [Type III], it was defined as a Type II search). Therefore, the analyses below examining the success rates for Type I, II, and III searches are mutually exclusive.

The influences of drivers' characteristics and Troopers' characteristics are examined within these three categories of searches and are reported in Table 7.3. Overall, this table shows that 38.8% of PSP searches in 2009 were Type I, 29.2% were Type II, and 32.0% were Type III. The results in Table 7.3 indicate significant differences in the percentages of search types across racial/ethnic groups. Unlike some previous years, but similar to results from 2008, there were no significant racial/ethnic differences in mandatory searches. Hispanics, however, were significantly less likely to be searched for probable cause/reasonable suspicion and significantly more likely to be searched based solely on consent compared to Whites and Blacks.

Male drivers were significantly less likely than females to be searched for mandatory reasons, but significantly more likely to be searched for Type II and III reasons. Drivers who were less than 25 years old were significantly more likely to be searched for mandatory reasons, while drivers over 25 years old were more likely to be searched for probable cause/reasonable suspicion and consent reasons compared to younger drivers. A considerably larger percentage of Pennsylvania residents were searched for mandatory (Type I) reasons, while a larger percentage of non-Pennsylvania residents were searched for consent reasons. Type II searches did not significantly differ by drivers' residency.

There were also differences in the reasons for a search based on Troopers' characteristics. White Troopers were significantly less likely to conduct searches for mandatory reasons compared to non-White Troopers. There were no statistically significant differences between White and non-White Troopers on probable cause/reasonable suspicion searches or consent-only searches. There were no statistically significant differences in types of searches by Trooper gender. There were also differences in the types of searches conducted across Troopers' experience and education. More experienced Troopers were more likely to conduct consent searches and searches based on probable cause/reasonable suspicion and less likely to conduct mandatory searches compared to Troopers with less than five years of

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[15] Type II and III categories have been slightly changed from previous reports. In the current report, only searches based solely on consent are captured as Type III searches.

experience. Finally, Troopers with 2 or 4 year degrees were significantly more likely to conduct mandatory and consent searches and less likely to conduct probable cause/reasonable suspicion searches compared to Troopers with no college degree. The reasons for these Trooper differences in types of searches may be assignment based – this explanation cannot be directly assessed in the bivariate analyses reported in Table 7.3.

Table 7.3 Reasons for Search (by search type) by Driver and Trooper Characteristics

	Total # of Searches	Type I: % Mandatory Searches	Type II: % Probable Cause/Reasonable Suspicion Searches	Type III: % Consent Searches
All Drivers	3,414	38.8	29.2	32.0
By Drivers' Characteristics				
White Driver	2,073	37.0	32.2***	30.9
Black Driver	893	40.6	27.0	32.4
Hispanic Driver	346	46.2	17.6	36.1
Male Driver	2,851	37.3***	29.9*	32.8*
Female Driver	529	46.7	25.5	27.8
Driver under 25 years old	1,999	43.9***	25.9***	30.2**
Driver over 25 years old or older	1,379	31.3	34.0	34.7
Driver PA Resident	2,730	43.1***	28.5	28.4***
Driver Non-PA Resident	650	20.6	32.2	47.2
By Troopers' Characteristics				
White Trooper	3,026	38.0*	29.5	32.5
Non-White Trooper	239	44.8	26.4	28.9
Male Trooper	3,140	38.2	29.4	32.4
Female Trooper	125	44.8	26.4	28.8
<5 years experience	1,643	43.9***	26.5***	29.6***
>5 years experience	1,622	32.9	32.1	35.0
No College Degree	589	31.7***	45.2***	23.1***
2 Year Degree	780	35.3	25.8	39.0
4 Year Degree or more	1,896	41.9	25.8	32.3

NOTE: * p < .05, ** p < .01, *** p < .001

TYPES OF SEIZURES

Table 7.4 documents the types of evidence and/or contraband confiscated during searches conducted by PSP Troopers. In 2009, there were 955 seizures of contraband resulting from 3,414 searches (28.0% of searches resulted in the discovery of contraband). A majority of

the contraband seized was drugs (75.5%), followed distantly by "other" (16.8%)[16], alcohol (10.9%), and cash (7.1%). Note that a single search could produce multiple types of contraband seized; therefore, the sum of percentages in the various categories in Table 7.4 may exceed 100%. Table 7.4 also documents the differences in the types of evidence seized across areas and troops. The trends displayed at the department level were, with few exceptions, consistent across area and troop levels. More fluctuation was evident at the station level (shown in Table 7.5), particularly in locations with small numbers of contraband seizures.

Table 7.4: Types of Evidence Seized by Department, Area, and Troop

	# of Seizures	% Cash	% Drugs	% Vehicle	% Weapons	% Stolen Prop.	% Alcohol	% Other
PSP Dept.	955	7.1	75.5	4.2	5.0	1.4	10.9	16.8
AREA I	340	6.2	72.4	3.2	5.6	0.9	11.5	20.9
Troop J	93	4.3	66.7	2.2	3.2	0.0	9.7	28.0
Troop K	192	6.8	75.0	3.6	7.8	1.0	12.5	17.7
Troop L	8	37.5	50.0	0.0	0.0	0.0	12.5	0.0
Troop M	47	2.1	76.6	4.3	2.1	2.1	10.6	23.4
AREA II	138	12.3	84.8	7.2	4.3	1.4	6.5	8.0
Troop F	60	18.3	83.3	13.3	5.0	1.7	8.3	10.0
Troop N	31	6.5	87.1	6.5	3.2	0.0	3.2	9.7
Troop P	6	0.0	100.0	0.0	0.0	0.0	0.0	0.0
Troop R	41	9.8	82.9	0.0	4.9	2.4	7.3	4.9
AREA III	192	5.7	77.1	1.6	6.3	0.0	15.1	14.6
Troop A	36	11.1	80.6	0.0	5.6	0.0	8.3	16.7
Troop G	76	6.6	81.6	3.9	9.2	0.0	6.6	18.4
Troop H	80	2.5	71.3	0.0	3.8	0.0	26.3	10.0
AREA IV	210	4.8	73.3	3.3	3.8	1.0	11.4	20.0
Troop C	21	4.8	76.2	4.8	4.8	0.0	4.8	23.8
Troop D	103	8.7	80.6	4.9	3.9	1.9	11.7	14.6
Troop E	45	0.0	53.3	0.0	0.0	0.0	8.9	40.0
Troop B	41	0.0	75.6	2.4	7.3	0.0	17.1	9.8
B. Patrol	75	12.0	74.7	12.0	4.0	8.0	4.0	10.7
Troop T	75	12.0	74.7	12.0	4.0	8.0	4.0	10.7

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[16] The "other" category includes contraband that does not fit in the other given categories but was not specified on the original CDR. The CDR X-press does include a field where Troopers may manually enter this information. The most frequent type of "other" contraband indicated was drug paraphernalia.

Table 7.5: Types of Evidence Seized by Station (p. 1 of 3)

	# of Seizures	% Cash	% Drugs	% Vehicle	% Weapons	% Stolen Prop.	% Alcohol	% Other
AREA I								
Troop J								
Avondale	42	4.8	73.8	0.0	0.0	0.0	9.5	31.0
Embreeville	12	0.0	50.0	0.0	16.7	0.0	16.7	16.7
Ephrata	10	10.0	70.0	0.0	0.0	0.0	30.0	0.0
Lancaster	29	3.4	62.1	6.9	3.4	0.0	0.0	37.9
Troop K								
Media	85	9.4	76.5	3.5	9.4	0.0	15.3	10.6
Philadelphia	73	4.1	72.6	5.5	5.5	1.4	9.6	13.7
Skippack	34	5.9	76.5	0.0	8.8	2.9	11.8	44.1
Troop L								
Frackville	2	0.0	100.0	0.0	0.0	0.0	0.0	0.0
Hamburg	0	--	--	--	--	--	--	--
Jonestown	4	75.0	25.0	0.0	0.0	0.0	0.0	0.0
Reading	1	0.0	100.0	0.0	0.0	0.0	0.0	0.0
Schuylkill Haven	1	0.0	0.0	0.0	0.0	0.0	100.0	0.0
Troop M								
Belfast	0	--	--	--	--	--	--	--
Bethlehem	3	0.0	100.0	0.0	0.0	0.0	0.0	33.3
Dublin	23	0.0	78.3	0.0	0.0	0.0	13.0	26.1
Fogelsville	15	6.7	73.3	6.7	6.7	0.0	6.7	20.0
Trevose	6	0.0	66.7	16.7	0.0	16.7	0.0	33.3
AREA II								
Troop F								
Coudersport	1	0.0	100.0	0.0	0.0	0.0	100.0	0.0
Emporium	0	--	--	--	--	--	--	--
Lamar	4	25.0	25.0	50.0	0.0	0.0	0.0	50.0
Mansfield	9	0.0	88.9	0.0	0.0	0.0	11.1	22.2
Milton	2	0.0	50.0	0.0	0.0	0.0	50.0	0.0
Montoursville	37	27.0	89.2	18.9	5.4	2.7	0.0	5.4
Selinsgrove	2	0.0	100.0	0.0	0.0	0.0	0.0	0.0
Stonington	5	0.0	60.0	20.0	20.0	0.0	40.0	0.0

Table 7.5: Types of Evidence Seized by Station (p. 2 of 3)

	# of Seizures	% Cash	% Drugs	% Vehicle	% Weapons	% Stolen Prop.	% Alcohol	% Other
Troop N								
Bloomsburg	2	0.0	50.0	0.0	50.0	0.0	50.0	0.0
Fern Ridge	1	0.0	100.0	0.0	0.0	0.0	0.0	0.0
Hazleton	6	0.0	83.3	16.7	0.0	0.0	0.0	33.3
Lehighton	6	0.0	100.0	0.0	0.0	0.0	0.0	0.0
Swiftwater	16	12.5	87.5	6.3	0.0	0.0	0.0	6.3
Troop P								
Laporte	5	0.0	100.0	0.0	0.0	0.0	0.0	0.0
Shickshinny	0	--	--	--	--	--	--	--
Towanda	1	0.0	100.0	0.0	0.0	0.0	0.0	0.0
Tunkhannock	0	--	--	--	--	--	--	--
Wyoming	0	--	--	--	--	--	--	--
Troop R								
Blooming Grove	8	0.0	62.5	0.0	12.5	0.0	25.0	0.0
Dunmore	11	9.1	81.8	0.0	9.1	0.0	9.1	9.1
Gibson	10	10.0	80.0	0.0	0.0	0.0	0.0	10.0
Honesdale	12	16.7	100.0	0.0	0.0	8.3	0.0	0.0
AREA III								
Troop A								
Ebensburg	4	25.0	75.0	0.0	0.0	0.0	0.0	0.0
Greensburg	11	27.3	100.0	0.0	0.0	0.0	9.1	0.0
Indiana	3	0.0	100.0	0.0	0.0	0.0	0.0	0.0
Kiski Valley	12	0.0	66.7	0.0	16.7	0.0	0.0	33.3
Somerset (A)	6	0.0	66.7	0.0	0.0	0.0	33.3	33.3
Troop G								
Bedford	10	30.0	70.0	10.0	10.0	0.0	20.0	30.0
Hollidaysburg	5	0.0	60.0	0.0	0.0	0.0	20.0	40.0
Huntingdon	8	12.5	87.5	12.5	25.0	0.0	0.0	25.0
Lewistown	17	5.9	100.0	0.0	5.9	0.0	0.0	0.0
McConnellsburg	20	0.0	80.0	0.0	10.0	0.0	5.0	15.0
Philipsburg	1	0.0	100.0	0.0	0.0	0.0	0.0	0.0
Rockview	15	0.0	73.3	6.7	6.7	0.0	6.7	26.7
Troop H								
Carlisle	46	4.3	76.1	0.0	4.3	0.0	28.3	4.3
Chambersburg	2	0.0	50.0	0.0	0.0	0.0	50.0	0.0
Gettysburg	8	0.0	37.5	0.0	12.5	0.0	50.0	0.0
Harrisburg	3	0.0	100.0	0.0	0.0	0.0	0.0	33.3
Lykens	11	0.0	81.8	0.0	0.0	0.0	18.2	9.1
Newport	1	0.0	0.0	0.0	0.0	0.0	0.0	100.0
York	9	0.0	66.7	0.0	0.0	0.0	11.1	33.3

Table 7.5: Types of Evidence Seized by Station (p. 3 of 3)

	# of Seizures	% Cash	% Drugs	% Vehicle	% Weapons	% Stolen Prop.	% Alcohol	% Other
AREA IV								
Troop C								
Clarion	4	25.0	50.0	25.0	0.0	0.0	0.0	75.0
Clearfield	6	0.0	100.0	0.0	0.0	0.0	0.0	0.0
Dubois	1	0.0	0.0	0.0	0.0	0.0	100.0	0.0
Kane	2	0.0	0.0	0.0	0.0	0.0	0.0	100.0
Punxsutawney	6	0.0	100.0	0.0	0.0	0.0	0.0	0.0
Ridgway	1	0.0	100.0	0.0	100.0	0.0	0.0	0.0
Tionesta	1	0.0	100.0	0.0	0.0	0.0	0.0	0.0
Troop D								
Beaver	8	12.5	75.0	0.0	37.5	0.0	12.5	50.0
Butler	13	0.0	61.5	0.0	0.0	0.0	7.7	38.5
Kittanning	53	13.2	79.2	5.7	0.0	1.9	17.0	9.4
Mercer	12	0.0	91.7	0.0	0.0	0.0	8.3	8.3
New Castle	17	5.9	94.1	11.8	5.9	5.9	0.0	0.0
Troop E								
Corry	3	0.0	33.3	0.0	0.0	0.0	66.7	0.0
Erie	16	0.0	93.8	0.0	0.0	0.0	0.0	12.5
Franklin	1	0.0	0.0	0.0	0.0	0.0	100.0	0.0
Girard	5	0.0	60.0	0.0	0.0	0.0	0.0	40.0
Meadville	18	0.0	16.7	0.0	0.0	0.0	5.6	77.8
Warren	2	0.0	100.0	0.0	0.0	0.0	0.0	0.0
Troop B								
Belle Vernon	1	0.0	100.0	0.0	0.0	0.0	0.0	0.0
Pittsburgh	5	0.0	60.0	0.0	0.0	0.0	40.0	0.0
Uniontown	24	0.0	75.0	0.0	8.3	0.0	12.5	12.5
Washington	6	0.0	66.7	16.7	16.7	0.0	33.3	16.7
Waynesburg	5	0.0	100.0	0.0	0.0	0.0	0.0	0.0
Bureau of Patrol								
Troop T								
Bowmansville	21	9.5	81.0	14.3	0.0	9.5	4.8	4.8
Everett	9	22.2	88.9	0.0	0.0	11.1	11.1	11.1
Gibsonia	0	--	--	--	--	--	--	--
Highspire	1	0.0	0.0	0.0	0.0	0.0	0.0	100.0
King of Prussia	21	0.0	66.7	9.5	0.0	9.5	4.8	14.3
New Stanton	14	28.6	92.9	28.6	0.0	0.0	0.0	7.1
Newville	3	0.0	33.3	0.0	66.7	0.0	0.0	0.0
Pocono	3	0.0	33.3	0.0	33.3	0.0	0.0	33.3
Somerset (T)	3	33.3	66.7	0.0	0.0	33.3	0.0	0.0

NOTE: Emporium, Shickshinny, and Tunkhannock conducted no searches.

SEARCH SUCCESS RATES

As described in previous final reports, the discovery of contraband during person and vehicle searches is an important outcome to consider when examining potential bias by police officers. Often referred to as search "success rates," or "hit rates" (i.e., the percent of searches conducted that produce contraband and/or resulted in arrest), some researchers use the "outcome test" to identify racial and ethnic disparities by examining differential outcomes in search success rates (Ayres, 2001; Knowles, Persico, & Todd, 2001). Racial/ethnic comparisons of hit rates are calculated by dividing the percent of searches in which officers seize some type of contraband (e.g., drugs, illegal weapons, etc.) by the number of total searches (Fridell, 2004; Ramirez et al., 2000). Some researchers have suggested that if drivers are searched strictly based on legal factors and suspicions unrelated to race, one would expect similar percentages of searches resulting in seizures across racial groups (Ayres, 2001; Knowles, Persico, & Todd, 2001). The application of the outcome test to police searches is based on the notion that if officers are profiling minority drivers based on racial prejudice, they will continue to search minorities even when the returns (i.e., the discovery of contraband) are smaller for minorities than the returns for searching Whites (Anwar & Fang, 2006). Conversely, if no bias exists, over a period of time a state of equilibrium will be achieved in which the police will search racial groups proportionate to their actual possession of contraband. The need to include multiple variables (i.e., multivariate model) is removed by reliance on the principle of equilibrium.

As with other analytical techniques, limitations exist that limit the conclusions that can be drawn from the outcome test (Engel, 2008; Engel & Tillyer, 2008). The outcome test is only appropriate for an analysis of traffic stops that result in a probable cause/reasonable suspicion search; therefore, mandatory and consent searches should not be considered. In addition, any racial/ethnic disparities in search success rates discovered using this method do not necessarily imply officer bias. Notwithstanding the limitations of the outcome test, it does provide an alternative method to assess post-stop outcomes. Nevertheless, no definitive conclusions about racial bias can be drawn from these comparisons based on the limitations of this technique (for details, see Engel, 2008; Engel & Tillyer, 2008).

Search Success Rates by Reason for Search

Prior to examining search success rates by race/ethnicity, this section documents the variation in search success rates by the reason for search. Based on PSP policies, Troopers have little discretion over some types of searches (e.g., inventory searches, searches incident to arrest, searches based on a preexisting warrant). Furthermore, it is likely that different reasons for searches might lead to varying search success rates. Table 7.6 explores this possibility by documenting the overall search success rate and the success rates for each specific type of search at both the department and area levels. Department-wide, the overall search success rate is 28.0% (i.e., 28.0% of searches conducted during member-initiated traffic stops result in the discovery of contraband). This rate, however, varies dramatically across search types, as exemplified by the range from 92.1% success for search warrant searches to 11.4% success for searches based on "other" reasons. Searches based on inventory and "other" unspecified reason were the least likely to be successful in terms of

discovering contraband, with success rates at 18.0% and 11.4%, respectively. Searches likely to be moderately successful included: consent (31.3%) and incident to arrest (35.5%). Note, however, that when searches conducted solely based on consent are examined, the hit rates decreases to 21.0%. In slightly over half of the searches conducted based on drug odor (53.7%) and reasonable suspicion/probable cause (53.4%) contraband was seized. Searches based on search warrants (92.1%), plain view (78.1%), and canine alerts (72.6%) were the most likely to be successful in terms of seizing contraband. These patterns remain relatively consistent across geographical areas within the department.

Table 7.6: Search Success Rates by Reasons for Search for Department and Areas

	Overall Search Success Rate	Incident to Arrest Success Rate	Inventory Success Rate	Search Warrant Success Rate	Plain View Success Rate	Canine Alert Success Rate	Drug Odor Success Rate	Consent Success Rate	Reas. Susp./ PC Success Rate	Other Reason Success Rate	Consent Only Success Rate
PSP Dept.	28.0	35.5	18.0	92.1	78.1	72.6	53.7	31.3	53.4	11.4	21.0
AREA I	21.2	30.0	15.5	100.0	85.3	60.0	50.0	24.3	47.1	8.2	16.0
AREA II	30.6	29.2	25.5	100.0	91.3	100.0	43.2	33.3	48.6	18.0	26.8
AREA III	30.0	47.2	20.5	66.7	57.1	55.6	55.7	29.9	48.9	8.8	18.2
AREA IV	39.4	40.8	40.5	87.5	93.7	73.3	58.2	41.1	57.7	14.3	27.6
BUREAU OF PATROL	41.9	47.6	38.9	100.0	100.0	80.0	68.3	41.2	80.0	0.0	28.0

NOTE: Search success rates are measured as the percent of searches that resulted in a seizure of contraband; thus all search success rate entries in the table are percentages.
* Five or fewer searches conducted for this reason; interpret percentage with caution.

Information regarding the search success rates of different types of searches is further summarized below. In Table 7.7, search success rates for each type of search (collapsed by level of officer discretion) are displayed. Again, types of searches are classified as follows: Type I includes mandatory searches that are required by PSP policy (searches incident to arrest, searches based on a pre-existing warrant, and inventory searches), Type II includes searches that are not mandatory but rather, are based on officer discretion (plain view searches, canine alert searches, drug odor searches, and reasonable suspicion or probable cause searches), and Type III includes searches that are based only on consent. As illustrated in this table, Type II probable cause/reasonable suspicion searches were the most successful in terms of recovering contraband (39.7%), while Type III consent searches were the least successful (21.3%). The search success rate for mandatory Type I searches was 25.1%. The success rate patterns were slightly different across areas. Searches conducted by Troopers assigned to the Bureau of Patrol were most successful in recovering contraband during mandatory searches, while Area IV and the Bureau of Patrol reported the most seizures during probable cause/reasonable suspicion searches. Consent search success rates were the lowest across all areas when compared to Type I and Type II searches.

Table 7.7: Search Type Success Rates by Department and Areas

	Overall Search Success Rate	Type I: Mandatory Search Success Rate	Type II: Probable cause/reasonable suspicion Search Success Rate	Type III: Consent Search Success Rate
PSP Dept.	28.0	25.1	39.7	21.3
AREA I	21.2	18.4	36.5	16.4
AREA II	30.6	28.7	36.6	26.8
AREA III	30.0	41.4	33.2	18.3
AREA IV	39.4	41.7	48.9	27.4
Bureau of Patrol	41.9	48.6	53.6	28.0

NOTE: Search success rates are measured as the percent of searches that resulted in a seizure of contraband; thus all search success rate entries in the table are percentages.

Search Success Rates by Drivers' and Troopers' Characteristics

It is also important to examine whether the search success rates vary based on drivers' and Troopers' characteristics. As noted previously, however, only Type II searches should be analyzed for purposes of the "outcome test," as these searches are the only ones that are based solely on officer discretion (i.e., are not mandatory to perform or require compliance by citizens in the form of giving consent). Therefore, information regarding only the Type II search success rates is reported in Table 7.8 below.

Table 7.8: Probable cause/reasonable suspicion Search Success Rates by Driver &Trooper Characteristics

	Total # Searches	Total # of Type II Probable Cause/Reasonable Suspicion Searches	Type II: Probable Cause/Reasonable Suspicion Search Success Rate
All Drivers	3,414	988	29.2
By Drivers' Characteristics			
White Driver	2,073	299	44.8***
Black Driver	893	70	29.0
Hispanic Driver	346	16	26.2
Male Driver	2,851	348	32.6**
Female Driver	529	44	40.8
Driver under 25 years old	1,999	182	35.1**
Driver over 25 years old or older	1,379	209	44.6
Driver PA Resident	2,730	334	42.9***
Driver Non-PA Resident	650	58	27.8
By Troopers' Characteristics			
White Trooper	3,026	347	38.9
Non-White Trooper	239	24	38.1
Male Trooper	3,140	365	39.5***
Female Trooper	125	6	18.2
Less than 5 years experience	1,643	157	36.1
5 years experience or more	1,622	214	41.1
No College Degree	589	94	35.3
2 Year Degree	780	82	40.8
4 Year Degree or more	1,896	195	39.9

NOTE: * $p < .05$, ** $p < .01$, *** $p < .001$

Table 7.8 shows that there are significant differences in the probable cause/reasonable suspicion search success rates across some driver and Trooper characteristics. As shown in this table, and graphically displayed in Figure 7.1 below, the results of the outcome test for race/ethnicity indicate that White drivers who are searched for probable cause/reasonable suspicion reasons were significantly more likely to be found in possession of contraband compared to searched Black and Hispanic drivers. Specifically, 44.8% of probable cause/reasonable suspicion searches of White drivers were successful, compared to 29.0% of searches of Black drivers, and only 26.2% of searches of Hispanic drivers.

Figure 7.1: Racial/Ethnic Differences in Type II Search Success Rates
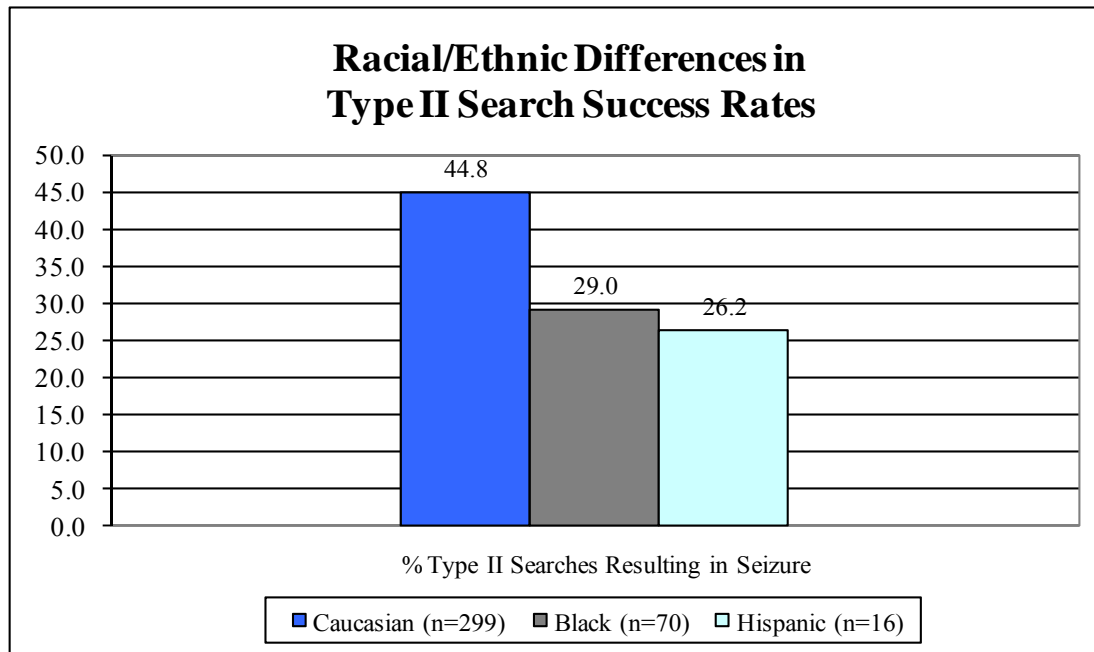
Racial/Ethnic Differences in Type II Search Success Rates

% Type II Searches Resulting in Seizure

■ Caucasian (n=299) ■ Black (n=70) □ Hispanic (n=16)

NOTE: Differences across the racial/ethnic groups presented in this figure are statistically significant at p ≤ .001

Statistically significant differences in Type II search success rates are also evident based on other driver characteristics. Unlike in 2008 when no statistically significant differences in search success rates were evident based on driver gender, age, and residency, the analyses of the 2009 data show that females, drivers over 25, and Pennsylvania residents were more likely to have contraband seized during Type II searches than their male, younger, and out-of-state counterparts. Statistically significant differences in probable cause/reasonable suspicion search success rates also exist based on Trooper gender. Specifically, male Troopers are more likely to discover contraband during probable cause/reasonable suspicion searches than are their female counterparts. No statistically significant differences in Type II search success rates are evident based on Trooper race, experience, or education.

Specific categories of Type II search success rates were further explored in an effort to better understand these racial/ethnic disparities. Table 7.9 reports the search success rates by race/ethnicity for specific types of searches contained with the larger Type II search category. Specifically, racial/ethnic differences in search success rates based on drug odor searches, plain view, canine alert, probable cause, and other reasons are reported. As shown, no statistically significant racial differences in search success rates are reported for plain view, canine alert, and "other" reasons. Statistically significant differences are evident by driver race for searches based on drug odor and probable cause. Specifically, for searches based on drug odor, 56.6% of searches of White drivers resulted in the seizure of contraband, compared to 48.9% of Black drivers and 35.1% of Hispanic drivers. Similarly, 57.4% and 52.2% of probable cause searches of White and Black drivers resulted in the seizure of

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contraband, compared to 31.3% of Hispanic drivers. Although these differences are based on a small number of searches, they are deserving of further scrutiny.

In summary, although PSP Troopers were significantly more likely to search Black and Hispanic motorists during traffic stops, as compared to White motorists, search success rates for probable cause/reasonable suspicion searches indicate that Blacks and Hispanics were significantly less likely than Whites to be found in possession of contraband. This finding is consistent with findings from other state and local police agencies across the country, as well as previous reports issued for the PSP. This suggests that rather than individual police officer bias, there are larger cultural, social psychological, and/or organizational explanations for these disparities. One possible explanation for this gap is that language and/or cultural differences between officers and minority citizens may create "false positive" searches. Officers may misread verbal or nonverbal cues from minority motorists, and therefore, may be mistaken more often in their suspicions that lead to discretionary searches.

Alternatively, searched Blacks and Hispanics may, *in fact*, possess contraband at lower rates than Whites because Troopers are over-searching minority motorists when compared to their involvement in criminal activity. It is important to note, however, that the current PSP data collection system does not measure the quantity of contraband seized during searches. Research in another statewide study of this kind indicated that Hispanic motorists were more likely than Whites to be in possession of sale or transportation quantities of drugs as compared to personal use amounts (Engel, Cherkauskas, & Smith, 2011). Although it is beyond the scope of the current Pennsylvania data to examine whether the same finding applies, it is possible that Troopers may consciously or unconsciously be willing to tolerate lower success rates in their searches of minority drivers because of the probability that they could uncover more significant quantities of drugs when compared to searches of Whites.

Finally, as noted in previous reports, it is plausible that Troopers hold different thresholds for reasonable suspicion either overtly or subconsciously for different racial/ethnic groups. For example, Smith and Alpert (2007) proposed a theory of police behavior, rooted in social–psychological research on stereotypes, which suggests that officers have unintentional but biased responses during encounters with minority citizens. Specifically, they suggest that police may develop subconscious, cognitive scripts based on exposure to societal or media conceptions about particular groups, vicarious experiences, and their own personal contacts with groups that they repeatedly encounter in situations involving criminal activity (see also, Smith, Makarios, & Alpert, 2006). These scripts are easily recalled in individual stops and may cause officers to be more likely to be suspicious of specific minority group members. When applied to searches, the social conditioning theory would suggest that some of the racial/ethnic disparity in probable cause search success rates could be due to Troopers relying on these cognitive scripts that unintentionally cause them to differentially assess the suspiciousness of stops with members of different racial/ethnic groups. If an officer's suspicion is subconsciously triggered more often in situations with minority drivers, this may contribute to higher search rates and lower search success rates of these drivers.

Based on the same discrepancy in earlier reports, nine focus groups were conducted with PSP Troopers in 2005 to better understand patterns and practices related to search and seizure

during traffic stops, specifically these racial and ethnic disparities for searches and search success rates. The goal of these focus groups was to document the most effective techniques related to search and seizure in order to improve and potentially alter departmental training and reduce the racial/ethnic disparities reported in the *Year 2 Final Report*. Focus group participants from the PSP, along with focus groups conducted with officers from other state police agencies including the Ohio State Highway Patrol, Nebraska State Patrol, and Arizona Department of Public Safety offered several insightful and plausible interpretations for the inconsistent search success rates across racial/ethnic groups. Specifically, focus group participants indicated that lower search success rates for minority drivers (and in particular, Hispanic drivers) may be due to: 1) limited training, 2) Troopers relying on one or two indicators of suspicion (possibly including race or race-related stereotypes) rather than the totality of circumstances, 3) a limited understanding of cultural differences in behaviors across racial/ethnic groups, and 4) different drug trafficking methods (e.g., hidden compartments) used across racial/ethnic groups.

Although the PSP has implemented portions of previous recommendations regarding these issues, racial/ethnic disparities in search and seizure rates persist. Therefore, in Section 8, the UCPI team reemphasizes training recommendations and suggests data collection changes that may help to further the department's understanding of these racial/ethnic disparities in search and seizure rates.

Table 7.9: Racial/Ethnic Differences in Probable Cause/Reasonable Suspicion Search Success Rates by Reason for Search

	# Drug Odor Searches	Drug Odor Search Success Rate	# Plain View Searches	Plain View Search Success Rate	# Canine Alert Searches	Canine Search Success Rate	# Probable Cause Searches	Probable Cause Search Success Rate	# Other Searches	Other Search Success Rate
White Driver	401	56.6*	217	76.5	27	70.4	204	57.4*	177	12.4
Black Driver	131	48.9	35	82.9	29	75.9	69	52.2	94	11.7
Hispanic Driver	37	35.1	12	91.7	6	66.7	32	31.3	11	0.0

NOTE: * p < .05, ** p < .01, *** p < .001

SPOTLIGHT ON CONSENT SEARCHES

As noted previously, a substantial percentage of PSP searches in 2009 were based *solely* on drivers' consent (32.7%).[17] Yet, of the reasons identified on the Contact Data Report, "solely consent" is one of the least productive search reasons in terms of discovering contraband. Only 21.0% of searches based solely on consent resulted in the discovery of contraband. Examining whether consent search success rates vary by race/ethnicity, however, is complex. As noted above, it is unwise to utilize the outcome test to assess racial/ethnic bias in consent searches, because ultimately it is the citizen, not the officer, who has final discretion over whether these types of searches are conducted (citizens always have the right to refuse). As such, one of the underlying assumptions of the outcome test – that officers have full discretion over whether to conduct searches – is violated. Despite these limitations, in order to allow the PSP to better understand consent searches and their productivity, analyses examining racial/ethnic differences in consent search success rates are provided with the strong caveat that this information cannot be used to assess officer bias. This section includes: 1) an overview of consent searches; 2) an examination of driver and Trooper differences in requests for consent and granting/obtaining consent to search; and 3) an analysis of racial/ethnic differences in consent search success rates.

As demonstrated in Figure 7.2 below, of the 306,256 traffic stops initiated by PSP Troopers in 2009, 2,261 drivers (0.7%) were asked for consent to search.

- Of these 2,261 requests, 95.0% (2,148 requests) resulted in a consent search being conducted, while only 5.0% (116) did not. That is, an overwhelming majority of drivers gave their consent to be searched when asked by Troopers.
- Of the 2,148 consent searches that were conducted, 31.4% resulted in the discovery of contraband.
- Of the 2,148 consent searches that were conducted, 51.9% (1,115 searches) were based *solely* on consent; that is, there was no other reason indicated by the Trooper for the search. Of these 1,115 searches based *solely* on consent, 21.4% resulted in the discovery of contraband.
- Of the 116 consent search requests that did not result in consent searches, nearly all (99.1%) resulted in a search for a different reason (115 searches). Specifically, the overwhelming majority of these searches were conducted based on "other" reasons.[18] In these cases, the search success rate was zero. That is, none of these cases—where consent was refused but a search was conducted based on another reason—resulted in the discovery of contraband. The "other" coding in these cases is not specific to any individual station or troop; rather this coding applies across the department. It is, therefore, imperative to have a better understanding of what specifically is contained in this "other" reason category.

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[17] PSP Troopers' heavy reliance on the use of consent searches is due, in part, to the unique case law in Pennsylvania guiding vehicular searches, which does not allow searches based on probable cause without a search warrant.

[18] Again, the exact reasons for "other" are unknown to the UC research team.

- The search success rate for the remaining one search request is not calculable because this search request did not result in a search being conducted for any other reason.

Figure 7.2: 2009 PSP Requests for Consent and Consent Searches

```
┌──────────────────┐        ┌──────────────────┐
│    306,256       │        │     2,261        │
│  traffic stops   │ ─────▶ │   requests for   │
│ initiated by PSP │        │   consent to     │
│ Troopers in 2009 │        │     search       │
└──────────────────┘        └──────────────────┘
                                      │
                                      ▼
                              ╱───────────────╲
                             ╱  Did request    ╲     Yes
┌──────────────────┐        ╱  for consent      ╲
│ 116 cases (5.0%) │◀──────  result in           ──────────▶ ┌──────────────────┐
│ where consent    │        ╲  consent          ╱            │2,148 cases(95.0%)│
│ search NOT       │         ╲  search?         ╱             │ where consent    │
│ conducted        │          ╲───────────────╱              │ search conducted │
└──────────────────┘              No                         └──────────────────┘
      │        │                                                   │        │
      ▼        ▼                                                   ▼        ▼
┌──────────┐ ┌──────────┐                          ┌──────────┐ ┌──────────────┐
│115(99.1%)│ │1 (0.9%)  │                          │  31.4%   │ │Of these,51.9%│
│ cases    │ │ case     │                          │any consent│ │ (n=1,115)    │
│resulted  │ │resulted  │                          │search    │ │ were based   │
│in search │ │in no     │                          │success   │ │ solely on    │
│for other │ │search for│                          │rate      │ │ consent      │
│reason    │ │any reason│                          └──────────┘ └──────────────┘
└──────────┘ └──────────┘                                              │
      │                                                                ▼
      ▼                                                        ┌──────────────┐
┌──────────┐                                                   │   21.4%      │
│0.0%search│                                                   │ consent only │
│success   │                                                   │ search       │
│rate      │                                                   │ success rate │
└──────────┘                                                   └──────────────┘
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Driver and Trooper Differences in Requests for Consent

As noted above, of the 306,256 traffic stops initiated by PSP Troopers in 2009, 2,261 drivers (0.7%) were asked for consent to search. As shown in Table 7.10, there are significant differences based on driver and Trooper characteristics in who is asked for consent to search and who requests consent to search.

First, an examination of the drivers' race/ethnicity in Table 7.10 indicates that certain racial/ethnic groups were significantly more likely than others to be asked for consent to search. Specifically, 2.2% of Black drivers and 2.1% of Hispanic drivers were asked for consent to search, compared to only 0.5% of White drivers. These racial/ethnic differences are also graphically displayed in Figure 7.3 below.

Furthermore, Table 7.10 also reveals significant differences in requests for consent based on drivers' gender and age. Specifically, male drivers and drivers over 25 were significantly more likely to be asked for consent to search than females and drivers 25 and younger. No differences in consent requests were evident based on driver residency.

Table 7.10 also shows some significant differences in requests for consent based on Trooper experience and education. Less experienced Troopers and more educated Troopers were significantly more likely to ask for consent to search compared to more experienced and less educated Troopers. No statistically significant differences in consent requests were evident based on Trooper race or gender.

Table 7.10: Trooper and Driver Differences in Requests for Consent

	Total # Requests for Consent to Search	% of Stops Resulting in Request for Consent to Search
All Drivers	2,261	0.7
By Drivers' Characteristics		
White Driver	1,396	0.5***
Black Driver	597	2.2
Hispanic Driver	223	2.1
Male Driver	1,950	1.0***
Female Driver	311	0.3
Driver 25 years old or under	1,242	0.6***
Driver over 25 years old	1,017	1.1
Driver PA Resident	1,728	0.7
Driver Non-PA Resident	533	0.7
By Troopers' Characteristics		
White Trooper	2,050	0.7
Non-White Trooper	144	0.7
Male Trooper	2,113	0.7
Female Trooper	81	0.8
Less than 5 years experience	1,056	1.0***
5 years experience or more	1,138	0.6
No College Degree	387	0.4***
2 Year Degree	559	0.8
4 Year Degree or more	1,248	0.9

NOTE: * $p < .05$, ** $p < .01$, *** $p < .001$

Figure 7.3: Racial/Ethnic Differences in Requests for Consent to Search (n=293,443)
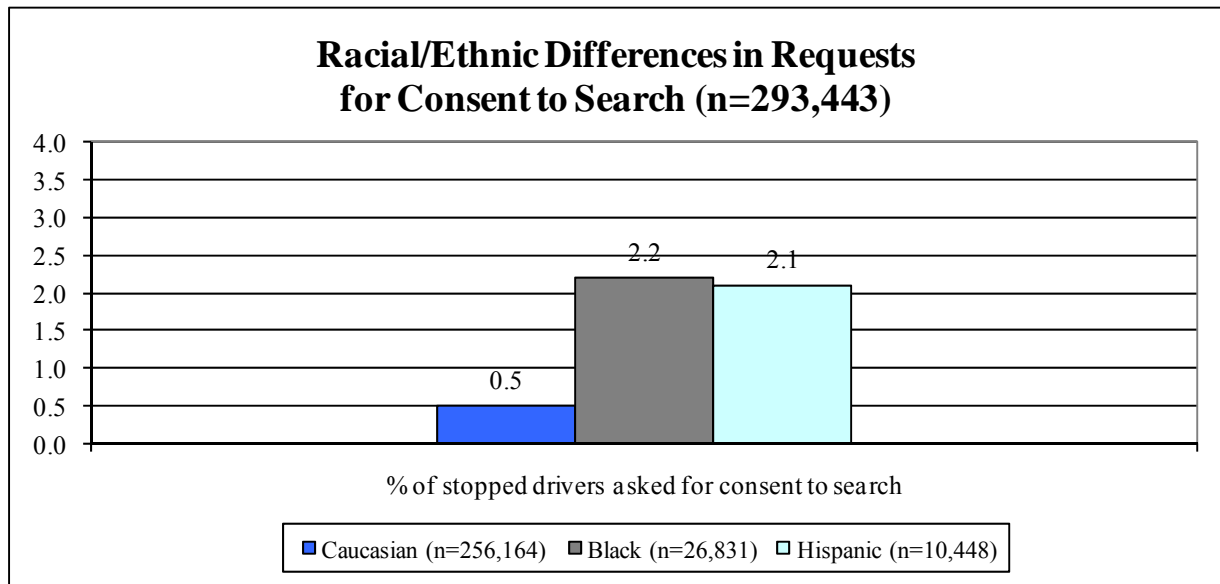
NOTE: Differences across the racial/ethnic groups presented in this figure are statistically significant at p ≤ .001.

Driver and Trooper Differences in Granting and Obtaining Consent

Figure 7.4 and Table 7.11 below compares the percentages of drivers who gave their consent to be searched based on driver characteristics. As shown, significant differences in the rates of granting consent are evident based on driver race/ethnicity. Specifically, Hispanics were significantly more likely to grant consent than Whites or Blacks. No significant differences in the rates of granting consent were noted for driver gender, age, or residency.

Figure 7.4: Racial/Ethnic Differences in Requests for Consent Resulting in Consent Search (n=2,216)
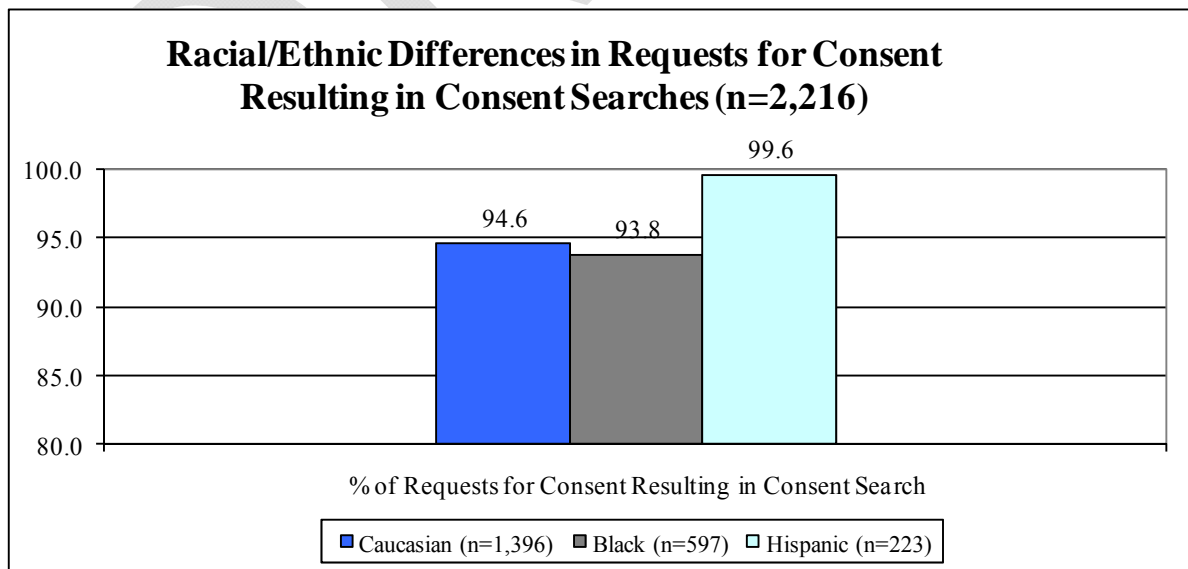
NOTE: Differences across the racial/ethnic groups presented in this figure are statistically significant at p ≤ .01.

Table 7.11 also documents the differences in obtaining consent across different types of Troopers. Similar to previous years, different types of Troopers were not more or less likely to obtain consent from drivers with but one exception: more educated Troopers were more likely than Troopers without a college degree to obtain consent from drivers.

Table 7.11: Trooper and Driver Differences in Granting and Obtaining Consent

	Total # Requests for Consent to Search	% Consent Requests Resulting in Consent Search
All Drivers	2,261	95.0
By Drivers' Characteristics		
White Driver	1,396	94.6**
Black Driver	597	93.8
Hispanic Driver	223	99.6
Male Driver	1,950	94.9
Female Driver	311	94.5
Driver 25 years old or under	1,242	95.6
Driver over 25 years old	1,017	94.0
Driver PA Resident	1,728	94.6
Driver Non-PA Resident	533	95.7
By Troopers' Characteristics		
White Trooper	2,050	94.9
Non-White Trooper	144	93.1
Male Trooper	2,113	94.9
Female Trooper	81	91.4
Less than 5 years experience	1,056	94.2
5 years experience or more	1,138	95.3
No College Degree	387	92.5
2 Year Degree	559	96.4
4 Year Degree or more	1,248	94.8

NOTE: * $p < .05$, ** $p < .01$, *** $p < .001$

Table 7.12 documents the differences across driver and Trooper characteristics in search success rates for searches based solely on consent and based on any consent (i.e., consent searches including additional reasons identified for the search). As shown in Table 7.12, White drivers who were searched based solely on consent and any consent were significantly more likely to be found in possession of contraband compared to Black and Hispanic drivers,

with the differences between White and Hispanic drivers being particularly dramatic. Specifically, 25.5% of searches of Whites based solely on consent were successful, compared to 18.0% of searches of Black drivers, and only 8.8% of searches of Hispanic drivers. The search success rates were somewhat higher for searches based on any consent (i.e., consent searches also based upon another reason for search). Searches of Whites, however, were still significantly more likely to result in the discovery of contraband (36.7%), compared to searches of Blacks (26.2%) and Hispanics (15.2%).

Table 7.12 also shows that consent searches of older drivers and Pennsylvania residents were significantly more likely to result in the discovery of contraband compared to searches of younger and out-of-state drivers. Some differences in consent search success rates were also evident based on Trooper characteristics, although no statistically significant differences exist by Trooper's race/ethnicity. Male Troopers, Troopers with more experience, and Troopers with no college degree were more likely than female Troopers, Troopers with less than 5 years experience, and Troopers with 2 or 4-year degrees to be successful in recovering contraband during searches based solely and partially on consent.

Table 7.12: Consent Search Success Rates by Driver and Trooper Characteristics

	Total # Searches	Total # of Consent Only Searches	Consent Only Search Success Rate	Total # of Any Consent Searches	Any Consent Search Success Rate
All Drivers	3,414	1,115	21.4	2,148	31.4
Driver Characteristics					
White Driver	2,073	651	25.5***	1,321	36.7***
Black Driver	893	311	18.0	561	26.2
Hispanic Driver	346	125	8.8	223	15.2
Male Driver	2,851	961	21.3	1,853	31.8
Female Driver	529	154	18.8	295	28.1
Driver 25 years old or under	1,999	629	18.3***	1,189	27.2***
Driver over 25 years old	1,379	485	24.5	957	36.5
Driver PA Resident	2,730	805	21.7	1,638	33.2***
Driver Non-PA Resident	650	310	19.0	510	25.5
Trooper Characteristics					
White Trooper	3,026	1,009	20.8	1,948	31.0
Non-White Trooper	239	77	24.7	135	31.9
Male Trooper	3,140	1,049	21.2	2,009	31.4*
Female Trooper	125	37	18.9	74	20.3
Less than 5 years experience	1,643	519	17.5**	998	26.6***
5 years experience or more	1,622	567	24.3	1,085	35.1
No College Degree	589	136	25.7	359	37.6**
2 Year Degree	780	320	22.8	540	31.5
4 Year Degree or more	1,896	630	19.2	1,184	28.8

NOTE: $* p < .05$, $** p < .01$, $*** p < .001$

It is possible that consent searches of minority drivers are less successful in terms of discovering contraband compared to Whites because "guilty" minority drivers are more likely to decline search requests when asked. Examinations of consent search requests when no search was conducted, however, suggest that this is unlikely. In 2009, a very small percentage of all drivers refused consent and analyses of consent search requests by race/ethnicity indicated that it is White drivers who were significantly more likely to refuse to consent to search when compared to Blacks and Whites. Therefore, it is highly unlikely that the explanation for the differences in search success rates for consent searches is that "guilty" minority drivers are avoiding detection by refusing consent. What appears more plausible is that the same causes for the racial/ethnic disparities in search success rates for probable cause/reasonable suspicion searches also pervade consent searches. Unfortunately, traffic stop data are very limited in their ability to offer causal explanations for racial/ethnic disparities.

SUMMARY

- For the year 2009, PSP Troopers conducted 3,414 searches, or 1.1% of all stops.

- In 2009, 62.9% of searches by Troopers were conducted based on drivers' consent. In addition, 32.7% of searched drivers were searched based solely on consent. The next most common reasons for a search included: inventory (24.5%), followed by incident to arrest (18.5%), the odor of drugs (16.8%), reasonable suspicion or probable cause (9.1%), and plain view (7.9%).

- In 2009, 38.8% of PSP searches were Type I (mandatory), 29.2% were Type II (probable cause/reasonable suspicion), and 32.0% were Type III (solely consent).

- Racial/ethnic differences in the types of searches were evident:
  - Unlike some previous years, but similar to results from 2008, there were no significant racial/ethnic differences in mandatory searches.
  - Hispanics, when compared to Whites and Blacks, were least likely to be searched for probable cause/reasonable suspicion but most likely to be searched based solely on consent.

- In 2009, 955 of the 3,414 searches resulted in the seizure of contraband (28.0%).

- A majority of the contraband seized was drugs (75.5%), followed distantly by "other" (16.8%), alcohol (10.9%), and cash (7.1%).

- Search success rates varied dramatically across the type of search authority.
  - Least successful: "Other" reason (11.4%) and vehicle inventory (18.0%)
  - Moderately successful: Consent (31.3%) and incident to arrest (35.5%). Note, however, that when searches conducted solely based on consent are examined, the hit rates decreases to 21.0%.
  - In over half of the searches conducted based on drug odor (53.7%) and reasonable suspicion/probable cause (53.4%) contraband was seized.

o   Most successful: search warrants (92.1%), plain view (78.1%), canine alerts (72.6%).

- Type II probable cause/reasonable suspicion searches were the most successful in terms of recovering contraband (39.7%), while Type III consent searches were the least successful (21.3%). The Type I (mandatory) search success rate was 25.1%.

- Probable cause/reasonable suspicion (Type II) searches of Black and Hispanic drivers (29.0% and 26.2%, respectively) were less successful in recovering contraband compared to searches of White drivers (44.8%).
  o   An examination of specific categories of Type II search success rates reveals that statistically significant racial/ethnic differences in search success rates exist for searches based on drug odor and probable cause.
    ▪   Drug odor: 56.6% of these searches of Whites resulted in the seizure of contraband, compared to 48.9% of Blacks and 35.1% of Hispanics.
    ▪   Probable cause: 57.4% and 52.2% of these searches of Whites and Blacks resulted in the seizure of contraband, compared to 31.3% of Hispanics.

- Of the 306,256 traffic stops initiated by PSP Troopers in 2009, 2,261 drivers (0.7%) were asked for consent to search.
  o   Of these 2,261 requests, 95.0% (2,148 requests) resulted in a consent search being conducted, while only 5.0% (116) did not.
  o   Of the 2,148 consent searches conducted, 31.4% resulted in the discovery of contraband.
  o   Of the 2,148 consent searches that were conducted, 51.9% (1,115 searches) were based *solely* on consent; that is, there was no other reason indicated by the Trooper for the search. Of these 1,115 searches based *solely* on consent, 21.4% resulted in the discovery of contraband.
  o   Of the 116 consent search requests that did not result in consent searches, nearly all (99.1%) resulted in a search for a different reason (115 searches). In these cases, the search success rate was zero.

- Black (2.2%) and Hispanic (2.1%) drivers were significantly more likely than White (0.5%) drivers to be asked for consent to search.

- Hispanics were significantly more likely to grant consent (99.6% of requests granted) when compared to Whites (94.6%) or Blacks (93.8%).

- Consent search success rates by race/ethnicity are provided with the strong caveats that they be used for purposes of internal comparisons and training only, and that *no definitive conclusions about racial bias should be drawn from these comparisons*.
  o   White drivers who were searched based solely on consent and any consent were significantly more likely to be found in possession of contraband compared to searched Black and Hispanic drivers.

- These findings cannot be used to determine the legality of and/or the presence of discrimination in individual searches conducted by PSP Troopers.

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8. CONCLUSIONS & RECOMMENDATIONS

OVERVIEW

The final section of this report summarizes the major findings provided within each of the sections of this report and documents the UCPI team's recommendations for consideration by PSP officials.

SUMMARY

This report documents the findings from statistical analyses of data collected during all member-initiated traffic stops by the Pennsylvania State Police (PSP) from January 1, 2009 – December 31, 2009. These data represent the eighth year of data collection for the Project on Police-Citizen Contacts. Information on 306,256 traffic stops was reported using the CDR X-press system or CDR forms, and collated into one dataset for analysis. Over 99% of the information was transmitted using the CDR X-press system. The department-wide error rate was 2.0%, which is considerably lower than the recommended 5% but reflects an increase from 0.6% in 2008. This error rate was associated mostly with changes to the data collection system and various adjustments made to that system. These minor fluctuations in error rates are to be expected when new data collection procedures are tested and implemented.

Basic descriptive analyses were conducted on the 306,256 officer-initiated traffic stops and reported at the department, area, troop, and station levels. Some of the trends in these descriptive findings are summarized below:

- Across the department, characteristics of the stop included:
  - The most frequent violation observed prior to traffic stops was speeding (69.0%), with an average amount over the limit of 19.4 mph. Other less commonly observed violations included: moving violations (17.4%), and equipment inspections (9.0%)

- Across the department, characteristics of the drivers included:
  - White (83.6%), Black (8.8%), Hispanic (3.4%), Middle Eastern (2.0%), and Asian/Pacific Islander (1.8%)

- Across the department, traffic stop outcomes can be summarized by the following characteristics:
  - 28.3% of stops resulted in a warning, 86.6% of stops resulted in a citation, 1.4% of stops resulted in arrest, and 1.1% of stops resulted in a search of either the occupant(s) and/or the vehicle
  - Of the searches conducted, 28.0% resulted in the discovery of contraband

In addition to analyzing the 2009 traffic stops, data collected between 2002 and 2009 at the department and troop levels were also analyzed.[19] It is important to note that the following results are descriptive and, even when based on statistical testing, cannot be used to

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[19] No area level rates were reported due to the changes in organizational structure in 2008.

determine the causes of the trends reported. Key findings of the department-level traffic stop temporal analyses include:

- Department wide, the 2009 percent of traffic stops involving Black drivers was 8.8% in 2009 and relatively unchanged from 2008. The 2009 percent was slightly higher than one standard deviation above the seven-year average.
- Department wide, the 2009 percent of traffic stops involving Hispanic drivers was 3.5%, which represents a slight decrease from the rate of stops of Hispanics in previous years. The 2009 percent was within one standard deviation of the seven-year average.
- Specific Troop-level trends for stops of Black and Hispanic drivers can be found in Section 4, while station-level trends for stops of minority drivers are presented in Appendix A.

It is important to note that the available data cannot be used to determine why the department or specific organizational units reported increases in the percentage of stops that were of Black or Hispanic drivers. Some factors potentially responsible for upward or downward trends include:

- Changes in the racial/ethnic composition of residential populations serviced by those organizational units which have altered the racial/ethnic composition of drivers eligible to be stopped
- Alterations to the reporting patterns by PSP troopers
- Other changes in travel patterns that differentially impact the percentages of minority drivers on particular roadways
- Adjustments to PSP deployment patterns and manpower allocation to address changes in reported criminal patterns and calls for service, resulting in higher concentrations of Troopers in areas where minorities are more likely to travel and/or violate the law
- Trooper behavior toward minority drivers may have changed across time.

Trend analyses were also conducted for traffic stop outcomes between 2002 and 2009. Using the same standard deviation methodology employed for the temporal analyses of traffic stops, the 2009 rate of all traffic stop outcomes was compared to the seven-year average:

- In 2009, the percentage of traffic stops that resulted in a warning (28.3%) was more than two standard deviations above the seven-year average. The rates of warnings issued have been steadily increasing since 2005, reaching a high of 28.3% in 2009.
- In 2009, the percentage of traffic stops that resulted in a citation (86.6%) was within one standard deviation of the seven-year average. There are two trends evident based on the eight years of data collection. Between 2002 and 2005, there was a steady increase in citation rates, from a low of 83.0% to a high of 88.1% of traffic stops in 2005. Since 2006, the citation rate has been relatively stable, with a slight drop-off in 2009.
- In 2009, the percentage of traffic stops that resulted in an arrest of the driver (1.4%) was within one standard deviation of the seven-year average and slightly more than the 2008 rate. The eight-year trend indicates that there was a considerable rise in the

arrest rate between 2004 and 2006, but this upswing is at least partially the result of discrepancies in the data collection regarding arrests prior to 2006, as documented in the *2003 - 2004 Final Report*. Therefore, it is likely that this reported upswing is simply the result of more accurate reporting since 2006, rather than changes in actual outcomes received by motorists. This is further evidenced by the stability in the arrest rate between 2006 and 2009.

- In 2009, the percentage of traffic stops that resulted in a search of the driver, vehicle, or passengers (1.1%) was within one standard deviation of the seven-year average and is identical to the 2008 rate. The eight-year trend indicates relative stability in the past four years after an increase in 2005. Similar to the arrest rate, however, there were some data collection problems prior to 2006, which may have resulted in an underreporting of searches throughout the department.

- In 2009, the percentage of searches that resulted in the discovery of contraband (28.0%) was within one standard deviation of the seven-year average and similar to the 2008 seizure rate. Note that the seizure rate includes the discovery of contraband from searches made for any reason.

The rate of traffic stop outcomes within racial/ethnic groups was also compared over time:

- Warnings: In 2009, the percentages of traffic stops of Black and Hispanic drivers that resulted in warnings were slightly higher than the warning rates for White drivers, which mirror the trends in 2007 and 2008. Across the eight years of data collection, the warning rate for White drivers decreased between 2002 and 2005, but increased slightly in the last four years. The warning rates for Black and Hispanic drivers have increased in the past three years.

- Citations: In 2009, the percentages of traffic stops of Black and Hispanic drivers that resulted in citations were higher than the rate for White drivers. Throughout the eight years of data collection, the citation rates for all groups increased between 2002 and 2004, but have stabilized in the past four years. Hispanic drivers consistently have the highest rate of citations, while White drivers are consistently the least cited group (except in 2007).

- Arrests: In 2009, the percentage of traffic stops that resulted in arrests was highest for Hispanic drivers, followed by Black and White drivers, respectively, and the difference between the groups remained similar to the three previous years. In all years, Hispanic drivers were arrested at a higher rate than the other two groups, with White drivers generally being arrested the least often. The overall arrest rates prior to 2006 may have been artificially depressed due to underreporting of arrests in those years. This should not, however, have influenced the differences across racial/ethnic groups, which are consistent across all eight years of data collection.

- Searches: In 2009, the percentage of traffic stops that resulted in searches was highest for Black drivers, followed by Hispanic drivers and White drivers. Throughout the eight years of data collection, the search rate of White drivers has been relatively stable, with a slight bump in 2006 and 2007. For Black drivers, the search rate indicates an upward trend between 2002 and 2007, with a slight decrease and stabilization in 2008 and 2009. The search rate for Hispanic drivers also increased in early years of data collection, but has stabilized and decreased since

2005. Note, however, that the dramatic differences across racial/ethnic groups in terms of search rates have persisted across time.

- Seizures: In 2009, the percentage of searches that resulted in discovery of contraband was highest for White drivers, followed by Black drivers and Hispanic drivers, respectively. For White drivers, the 2009 seizure rate mirrors the 2007 and 2008 seizure rates. In 2009, the seizure rate for Black drivers fell slightly compared to the previous four years, and the seizure rate for Hispanic drivers also fell slightly in 2009 compared to 2008. Of note, in all eight years of data collection, White drivers are consistently found with contraband at higher rates than either Black or Hispanic drivers.

There are a number of possible explanations for these racial disparities in post-stop outcomes. As a result, any interpretation of these findings must be made with caution.

In addition to the trend analyses of stop outcomes, the 2009 post-stop outcomes were examined in detail. This process involved both bivariate analyses and multivariate analyses of warnings, citations, arrests, and searches issued to drivers during member-initiated traffic stops conducted in 2009.

Bivariate Analyses
- At the department level, statistically significant racial/ethnic differences were noted for warnings, citations, arrests, and searches.
    - Black and Hispanic motorists were slightly more likely than White drivers to receive warnings.
    - Hispanic drivers had slightly higher rates of citations compared to White and Black drivers.
    - Black and Hispanic drivers had higher rates of arrest compared to White drivers.
    - The largest racial/ethnic differences are found for searches: Black and Hispanic drivers had significantly higher rates of searches (3.4% and 3.3%, respectively), compared to only 0.8% of White drivers.
- These patterns and trends varied somewhat at the area level and more so at the troop and station levels.
- When reviewing these results, it is important to remember that the bivariate analyses only consider two variables at a time. As a result, the interpretation of these findings, which indicate racial/ethnic differences, should be made with caution and cannot determine the existence of racial bias because other factors related to traffic stop outcomes were not considered in these analyses.
- PSP supervisors should review these findings for the best understanding of trends in racial/ethnic and gender disparities in stop outcomes within their jurisdictions.

Multivariate Analyses

Multivariate analyses are better suited to make substantive claims about the results of post-stop outcomes due to their consideration of more than one factor simultaneously. Nevertheless, multivariate analyses are limited by the type and amount of data collected. Conclusions based on any multivariate analyses are limited to the variables in the model, and

do not consider the potential of a misspecified model. Misspecified models occur when pertinent variables related to the dependent variables are not included in the model. Thus, multivariate analyses can only demonstrate racial/ethnic disparities that exist after statistically controlling for other factors that might influence officer decision making that are measured with these data. The findings summarized below represent the independent effects of driver race/ethnicity on traffic stop outcomes when other factors are statistically controlled.

- **Warnings**
  - Black and Hispanic drivers showed *no statistically significant differences* in the likelihood of being warned compared to Whites, while drivers of "other" race/ethnicity were 1.2 times less likely to be warned compared to White drivers.
  - Traffic stops initiated as a result of speeding were 2.0 times *less* likely to result in a warning compared to traffic stops initiated for other non-speeding reasons.
  - For each additional reason for the stop (traffic infraction), the likelihood of a warning *increased* 4.3 times.

Collectively, these results suggest slight, but substantively unimportant, racial/ethnic differences in the likelihood of receiving warnings; Troopers' decisions to issue warnings are most strongly based on legal factors rather than drivers' or Troopers' characteristics.

- **Citations**
  - Black and Hispanic drivers were *equally likely* to be cited compared to White drivers in similar situations, while drivers of "other" race/ethnicity were 1.3 times *more* likely than White drivers to be cited.
  - Traffic stops initiated due to speeding were 2.7 times *more* likely to result in a citation compared to stops initiated for non-speeding reasons.
  - The likelihood of being cited *increased* 1.5 times for every additional reason for the stop.
  - Traffic stops resulting in the discovery of contraband were 4.7 times *less* likely to result in a citation compared to stops with contraband discoveries (but more likely to result in arrest).
  - Traffic stops initiated by Troopers assigned to a patrol function were 3.0 times *more* likely to result in citations compared to traffic stops initiated by non-patrol assigned Troopers.

Collectively, these results demonstrate that Troopers' decisions to issue citations are most often based on legal factors and not drivers' or Troopers' characteristics.

- **Arrests**
  - There were *no statistically significant racial differences* for Black and Hispanic drivers when other factors were simultaneously considered. In other words, Black and Hispanic drivers were equally likely as White drivers to be arrested given similar circumstances surrounding the traffic stop.
  - Drivers of "other" race/ethnicity were 1.8 times *less* likely to be arrested compared to White drivers.

- o Traffic stops resulting in the discovery of contraband were over 288 times *more* likely to end in arrest compared to traffic stops without contraband discoveries.
- o Traffic stops initiated due to speeding were 4.4 times *less* likely to end in arrests compared to stops initiated for other reasons.
- o The likelihood of arrest *increased* 1.6 times for each additional reason for the stop.
- o No Trooper characteristics were significant predictors of the likelihood of arrest.

Collectively, these results demonstrate that the most severe sanction issued during traffic stops (i.e., arrest) is based on legal factors and not drivers' race/ethnicity, or Troopers' characteristics.

- **Searches**
  - o Black and Hispanic drivers were 2.8 and 2.3 times *more* likely to be searched compared to White drivers, respectively.
  - o Traffic stops initiated due to speeding were 4.2 times *less* likely to result in searches compared to traffic stops initiated for non-speeding reasons.
  - o The likelihood of a search *increased* 2.1 times for every additional reason for the stop noted on the form.
  - o Traffic stops initiated by Troopers assigned to a patrol function were 2.7 times *less* likely to conduct searches compared to traffic stops initiated by Troopers not assigned to patrol.

Collectively, these results demonstrate that racial/ethnic differences in the rates of searches cannot be explained by the legal and extralegal factors captured on the traffic stop forms. Given similar situations (as measured on the traffic stop form), Black and Hispanic drivers are significantly more likely to be searched compared to White drivers. Note, however, that 39% of these searches are mandatory searches (e.g., based on warrants, inventory, incident to arrest, etc.) that afford little officer discretion.

Search and Seizure

Due in part to the persistent racial/ethnic disparities evident in searches and search success rates, further analyses were conducted on 2009 search and seizure activity.

- For the year 2009, PSP Troopers conducted 3,414 searches (1.1% of all stops). The majority of these searches (62.9%) were conducted based on drivers' consent. In addition, 32.7% of searched drivers were searched based solely on consent.

- Other less common reasons for a search included: inventory (24.5%), followed by incident to arrest (18.5%), the odor of drugs (16.8%), reasonable suspicion or probable cause (9.1%), and plain view (7.9%).

- In 2009, 38.8% of PSP searches were Type I (mandatory), 29.2% were Type II (probable cause/reasonable suspicion), and 32.0% were Type III (solely consent).

- Racial/ethnic differences in the types of searches (i.e., mandatory, probable cause/reasonable suspicion, and consent) conducted by PSP Troopers were evident:
  - Unlike some previous years, but similar to results from 2008, there were no significant racial/ethnic differences in mandatory searches.
  - Hispanics, when compared to Whites and Blacks, were least likely to be searched for probable cause/reasonable suspicion but most likely to be searched based solely on consent.

- In 2009, 955 of the 3,414 searches resulted in the seizure of contraband (28.0%). A majority of the contraband seized was drugs (75.5%), followed distantly by "other" (16.8%), alcohol (10.9%), and cash (7.1%).

- Search success rates varied dramatically across the type of search authority.
  - Type II probable cause/reasonable suspicion searches were the most successful in terms of recovering contraband (39.7%), while Type III consent searches were the least successful (21.3%). The search success rate for mandatory Type I searches was 25.1%.

- Probable cause/reasonable suspicion (Type II) searches of Black and Hispanic drivers (29.0% and 26.2%, respectively) were less successful in recovering contraband compared to searches of White drivers (44.8%).
  - An examination of specific categories of Type II search success rates reveals that statistically significant racial/ethnic differences in search success rates exist for searches based on drug odor and probable cause.

- Of the 306,256 traffic stops initiated by PSP Troopers in 2009, 2,261 drivers (0.7%) were asked for consent to search.
  - Of these 2,261 requests, 95.0% (2,148 requests) resulted in a consent search being conducted, while only 5.0% (116) did not.
  - Of the 2,148 consent searches conducted, 31.4% resulted in the discovery of contraband.
  - Of the 2,148 consent searches that were conducted, 51.9% (1,115 searches) were based *solely* on consent. Of these 1,115 searches based *solely* on consent, 21.4% resulted in the discovery of contraband.
  - Of the 116 consent search requests that did not result in consent searches, nearly all (99.1%) resulted in a search for a different reason (115 searches). In these cases, the search success rate was zero.

- Black (2.2%) and Hispanic (2.1%) drivers were significantly more likely than White (0.5%) drivers to be asked for consent to search. Similarly, Hispanics were significantly more likely to grant consent (99.6% of requests granted) when compared to Whites (94.6%) or Blacks (93.8%).

- Consent search success rates by race/ethnicity are provided with the strong caveats that they be used for purposes of internal comparisons and training only, and that *no definitive conclusions about racial bias should be drawn from these comparisons*.

- o White drivers who were searched based solely on consent and any consent were significantly more likely to be found in possession of contraband compared to searched Black and Hispanic drivers.

Collectively these results demonstrate that Blacks and Hispanics motorists who were searched based on probable cause/reasonable suspicion or consent were significantly less likely than searched Whites to be found in possession of contraband. These statistical analyses, however, cannot be used to determine the legality of and/or the presence of officer bias in individual searches conducted by PSP Troopers.

RECOMMENDATIONS

Over the past eight years of data collection and analysis, the PSP has implemented a series of policy and training changes based on a series of recommendations provided by this research team. In this respect, the Pennsylvania State Police established an innovative and professional approach to understanding and addressing racial/ethnic disparities in traffic stop outcomes to ensure equitable treatment across racial/ethnic groups. When the results of this Year 8 Report are viewed in context of the previous reports, there are a number of consistent patterns.

First, across these eight years of data, there has been no consistent evidence to suggest that PSP Troopers disproportionately engage in traffic stops with minority motorists. Second, over time, the statistically significant racial/ethnic disparities in warnings, citations, and arrests have been eliminated. Third, despite these positive findings, the continued racial/ethnic disparities in discretionary and consent searches and the seizure of contraband during these searches indicate that additional work is still needed to better understand these continued disparities and ensure that PSP Troopers maintain their legitimacy among the citizens of the Pennsylvania Commonwealth. Although the PSP has implemented portions of previous recommendations regarding these issues, racial/ethnic disparities in search and seizure rates persist. This is the only consistently problematic issue in the reported data analyses. Therefore, below, the UCPI team reemphasizes previously offered training recommendations and suggests data collection changes that may help to further the department's understanding of these racial/ethnic disparities in search and seizure rates.

Based on the continuing trends of racial/ethnic disparities in searches and search success rates, the UCPI team reiterates its recommendation based on the focus group findings that the PSP institute training related to educating officers about the complexities of interactions with members of different racial/ethnic groups in general, and effective and culturally responsible criminal interdiction, more specifically.

Focus group participants from the PSP as well as a number of other state police agencies have offered a number of possible explanations for racial/ethnic disparity in searches and search success rates. Their insights, as well as empirical research (for review, see Engel & Johnson, 2006), have led the UCPI team to recommend the PSP implement additional academy and criminal interdiction training for Troopers regarding the complexities of interactions with members of different racial/ethnic

groups. Training should focus on the problems with using individual characteristics to determine suspicion, and better emphasize the importance of relying on multiple indicators, rather than one or two indicators of suspicion. Further, training should include criminal interdiction training that teaches officers about the racial/ethnic or cultural differences in verbal and nonverbal behaviors, and stress that these behaviors alone may not be valid indicators of suspicion in effectively detecting criminal activity. Changes in training to address this issue, however, must be carefully considered by PSP personnel. There are a number of concerns surrounding training curricula that identifies behavioral differences across racial/ethnic groups. It is critical that changes in criminal interdiction training designed to address these divergences provide accurate information regarding the potential differences in behaviors across racial/ethnic groups through descriptions regarding how these behavioral differences are best interpreted, as well as the use of tactics that provide more effective, efficient, and equitable services during traffic stops with all racial/ethnic groups.

The specific findings documented in this *Year 8 Report* should be disseminated to PSP supervisory personnel with a clear mandate to continue exploring the reasons for the racial/ethnic disparities reported in search and seizure rates, and attempt to reduce them if believed to be based on illegitimate factors.

It is critical that field supervisory personnel examine their officers' stopping and searching patterns and trends. There are several possible explanations for the continued racial/ethnic disparities in search and seizure rates that can best be understood based on local knowledge of the area and additional information that is not included in the data collection. If PSP officers are engaging in biased policing, it is likely to be revealed at the field supervisory level. While aggregate statistical analyses can provide supervisors with information to identify potentially problematic geographic areas or shifts, ultimately it is the more specific information available to field supervisors (e.g., citizen complaints, feedback from other officers, direct observation of patterns and practices) that will assist in identifying and eliminating any bias practices. For these reasons, it is critical that the PSP continue to improve the quality of its supervisory management and training, with an additional focus on detecting and eliminating officer bias.

PSP should continue to collect and analyze traffic stop data to examine patterns and trends in racial/ethnic disparities across the agency and across time.

By comparing multiple years of traffic stop data, it is possible to determine the relative effectiveness of any new policies and training on the rates of searches and seizures of minority drivers. Further, continual monitoring of traffic stops provides valuable information to the organization, while simultaneously institutionalizing a culture within the organization that inspires fair and equitable policing and demonstrating a public commitment to the same.

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The PSP should continue to periodically examine the current data collection system, and make any necessary changes to the system in an effort to continually enhance both the reliability and detail of the data collected.

Since this study began in 2002, the PSP has continually improved its traffic stop data collection system to enhance both data quality and the breadth of information that is collected. With the most recent update to the data collection system, the PSP has voluntarily included additional data fields that may improve the explanatory power of models predicting traffic stop outcomes and enhance our understanding of the relationship between driver race/ethnicity and stop outcomes. These data fields include information regarding vehicle condition, driver compliance with Trooper requests, driver impairment, and driver's criminal history. All of these factors have the potential to mitigate the racial/ethnic disparities currently reported. Unfortunately, the number of stops that include these additional explanatory variables account for just 1.1% of the stops for which PSP Troopers collected data in 2009. Therefore, it is recommended that the analyses of 2010 data include in-depth analyses of these additional variables to understand their ability to predict traffic stop outcomes.

For example, in 2008 the Arizona Department of Public Safety voluntarily included additional data fields into their traffic stop data collection program. Statistical analyses of these data have demonstrated that the explanatory power of the multivariate statistical models is improved and, in many cases, the previously reported racial/ethnic disparities in citations, arrests, and searches were reduced and/or eliminated due to the inclusion of these variables (Engel et al., 2009, Engel, Cherkauskas, & Smith, 2011). The most powerful of these explanatory variables have included drivers' demeanor, the presence of illegal aliens, the number and type of violations observed, and the presence of multiple pre-stop indicators of suspicion. These findings suggest that as racial profiling data collection efforts capture more relevant legal and extralegal information that has historically been unavailable, the previously reported impact of race/ethnicity is likely to diminish. Simply put, as we become better at measuring the relevant information, the reported level of bias is reduced significantly. The analyses of 2010 data in the *Year 9 Report* will allow for an examination of this possibility for PSP traffic stops and searches. Although it is unlikely that any traffic stop data collection protocol can accurately capture all possible explanations for racial/ethnic disparities, the additional data fields PSP incorporated into data collection in 2009 should allow for future analyses that can shed additional light on the reported racial/ethnic disparities in searches of drivers stopped by the PSP.

Furthermore, it continues to be important to get feedback from officers using the data collection system on a daily basis. These officers have working knowledge of the strengths and weaknesses of the current data collection system, and can provide information regarding enhancements. It is also important to routinely consider whether any additional elements should be added to the system to better understand reported racial/ethnic disparities. Although the PSP has already included many

important additional variables, it is highly probable that other factors unaccounted for within this data collection system might also better predict traffic stop outcomes, including, for example, pre-stop and during-the-stop indicators of possible criminal activity, the presence of illegal aliens, and the quantity of drug contraband seized. The PSP should consider further modifications to the data collection system that might improve the data's ability to explain currently reported racial/ethnic disparities. The inclusion of additional data fields, however, must be balanced with the need for an efficient data collection system.

It is obvious that PSP officials remain committed to both the traffic stop data collection effort and the larger goals of reducing racial/ethnic disparities in traffic stops and post-stop outcomes. They also have demonstrated the importance of providing legitimate and unbiased policing services to citizens of the Commonwealth of Pennsylvania. This commitment has been demonstrated by their ongoing data collection effort, which is currently in its tenth year, and is contractually scheduled through Dec 31, 2011. This report, as well as previous final reports, has documented that racial and ethnic disparities in traffic stops and post-stop outcomes are rare within the PSP. While racial/ethnic disparities in search and seizure rates remain an area of concern, these patterns mirror those reported in multiple jurisdictions and are the subject of continued examination by both academics and practitioners across the country. The department's implementation of the UCPI research team's recommendations will ensure that the PSP continues to be a leader among police agencies.

9. REFERENCES

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10. APPENDIX A: TRAFFIC STOPS 2002 – 2009 BY STATION

DRAFT

Appendix A features a series of figures (Figures 10.1 – 10.32) documenting the stopping trends of Black and Hispanic drivers by PSP Troopers at the station level between 2002 and 2009. This information is intended to supplement the information in Section 4 regarding the stopping trends of Black and Hispanic drivers at the department and troop level. The graphs in Appendix A were not constructed using the standard deviation methodology utilized for examining the trends at the department and troop level in Section 4. The graphs provided here simply report the rate of traffic stops by race/ethnicity between 2002 and 2009.[20]

As described in Section 4, temporal analyses are best used to summarize the rate of activity (i.e., the rate of traffic stops of a selected group) <u>within</u> organizational units <u>across</u> time. This section exclusively uses this type of analysis to compare the rate of traffic stops of Black and Hispanic citizens within one organizational unit. In this manner, the rates from year to year in a jurisdiction are comparable. In effect, differences between organizational units are considered in these analyses and do not influence the results. As a result, the strength of documenting temporal trends is to examine differences within organizational units across time.

The research team purposefully does not offer a value assessment of the 2009 rate in relation to the seven-year average. In other words, the research team does not assign a "cutoff value" for an acceptable rate of traffic stops. The graphs demonstrating temporal values are strictly a tool to assess trends over time in the rate of traffic stops and to identify organizational units that are experiencing noticeable increases in their rate of traffic stops of Black or Hispanic drivers. There are numerous factors beyond the scope of this methodology that may be directly related to changes in the rate of traffic stops. For example:
- changes in the traffic population within that jurisdiction
- alterations to the reporting patterns by PSP troopers
- adjustments in PSP traffic stop behaviors
- differences in deployment patterns across time
- modifications of manpower allocation

Any single factor or a combination of these factors may influence the rate of traffic stops of minority drivers in any year and result in an increase or decrease in the rates reported in the graphs below. The following graphs are to be interpreted with caution and cannot be used as evidence of overt biased policing by the PSP or any of its organizational units. While no definitive conclusions regarding bias in traffic stops can be ascertained from the following graphs, they do offer a basic picture of the traffic stopping trends by organizational unit.

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[20] Additional standard deviation analyses at the station level are available from the authors upon request.

Figure 10:1: Percent of Traffic Stops Involving Black Drivers – Troop J
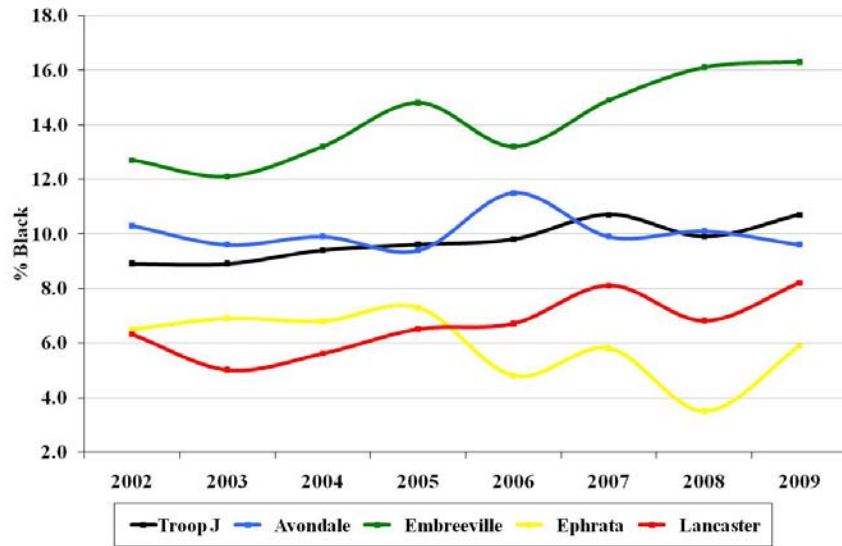
Figure 10:3: Percent of Traffic Stops Involving Black Drivers – Troop K
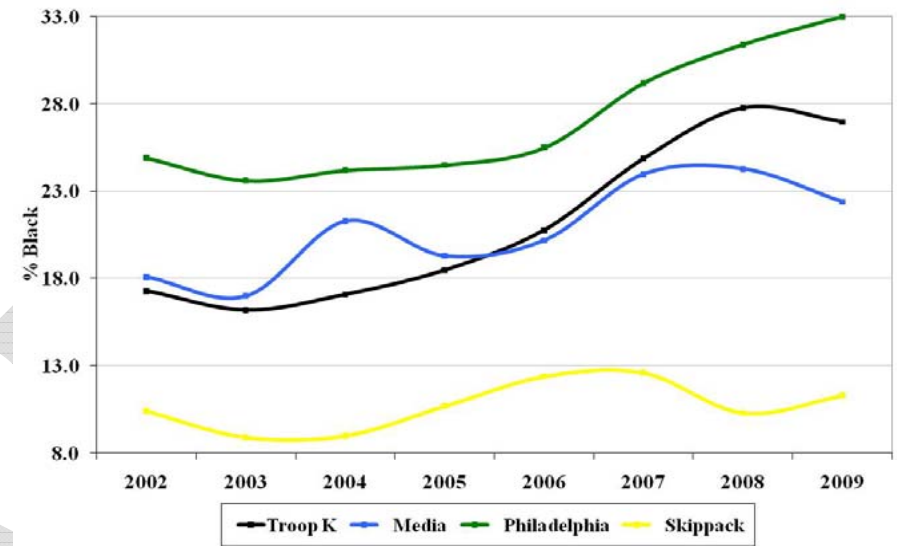
Figure 10:2: Percent of Traffic Stops Involving Hispanic Drivers – Troop J
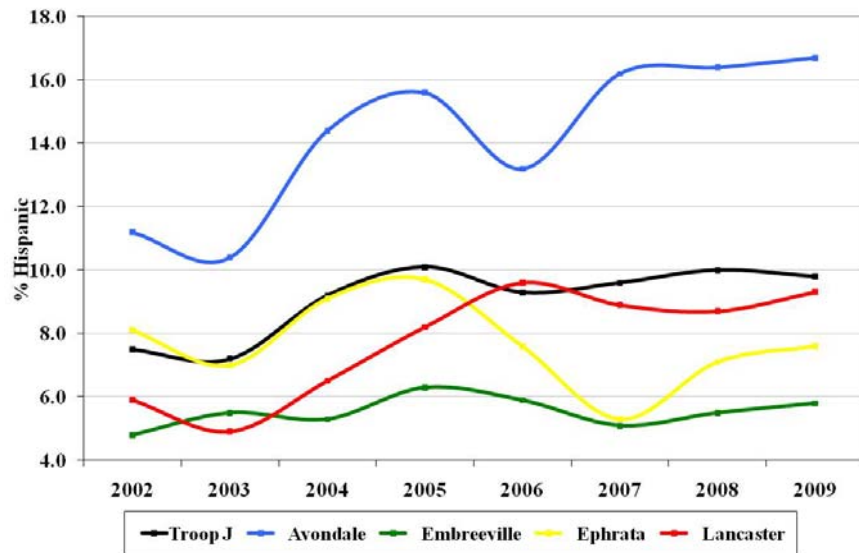
Figure 10:4: Percent of Traffic Stops Involving Hispanic Drivers – Troop K
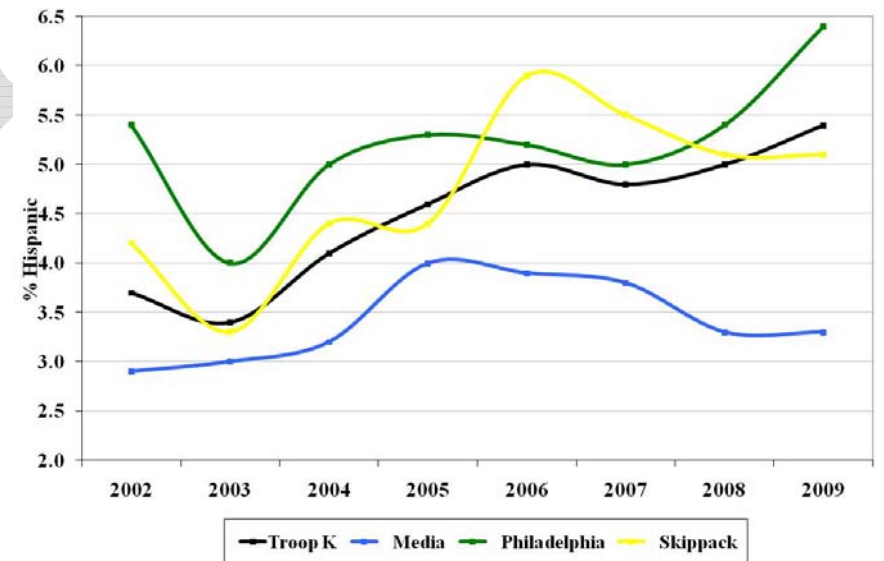
Figure 10:5: Percent of Traffic Stops Involving Black Drivers – Troop L
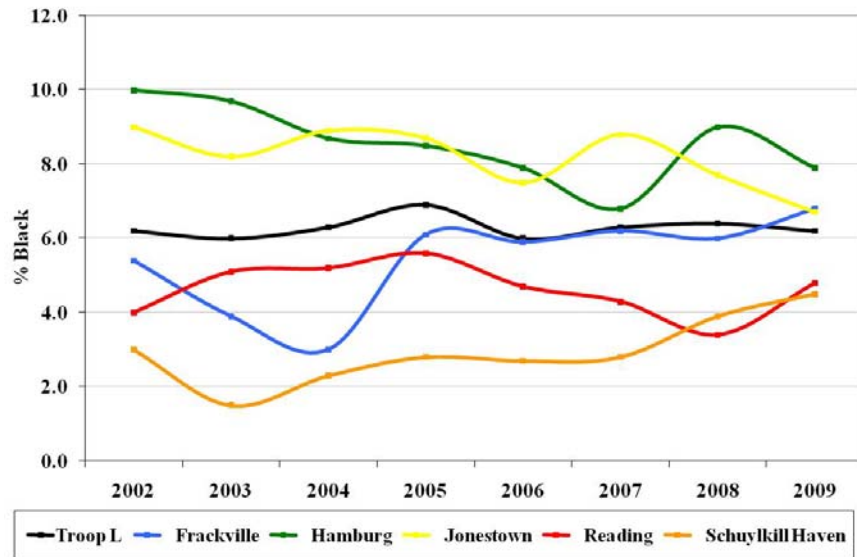
Figure 10:7: Percent of Traffic Stops Involving Black Drivers – Troop M
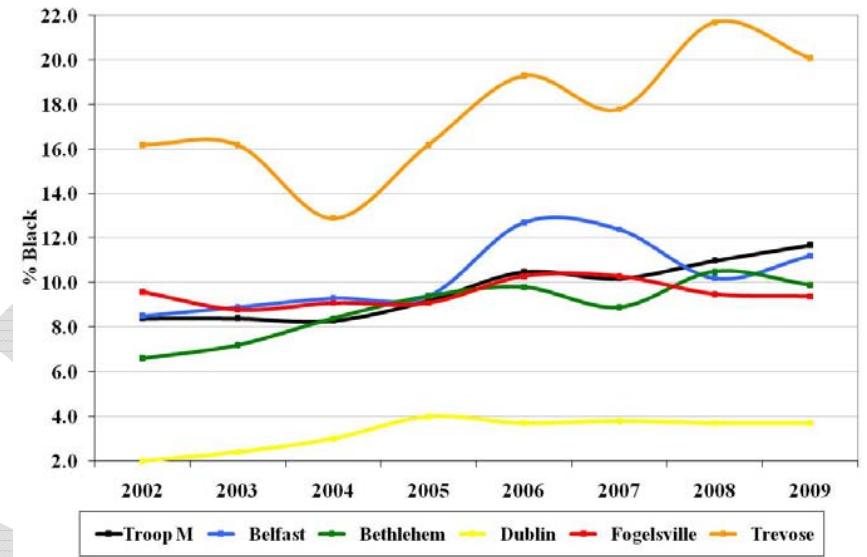
Figure 10:6: Percent of Traffic Stops Involving Hispanic Drivers – Troop L
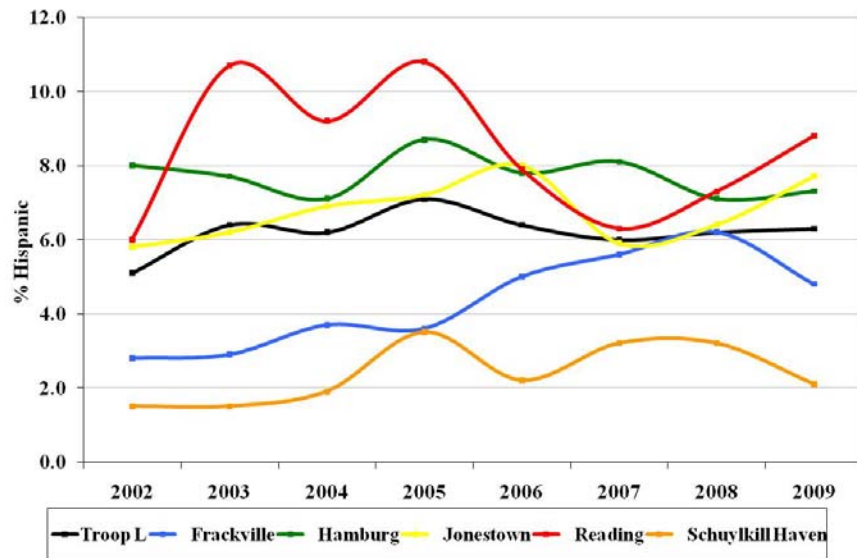
Figure 10:8: Percent of Traffic Stops Involving Hispanic Drivers – Troop M
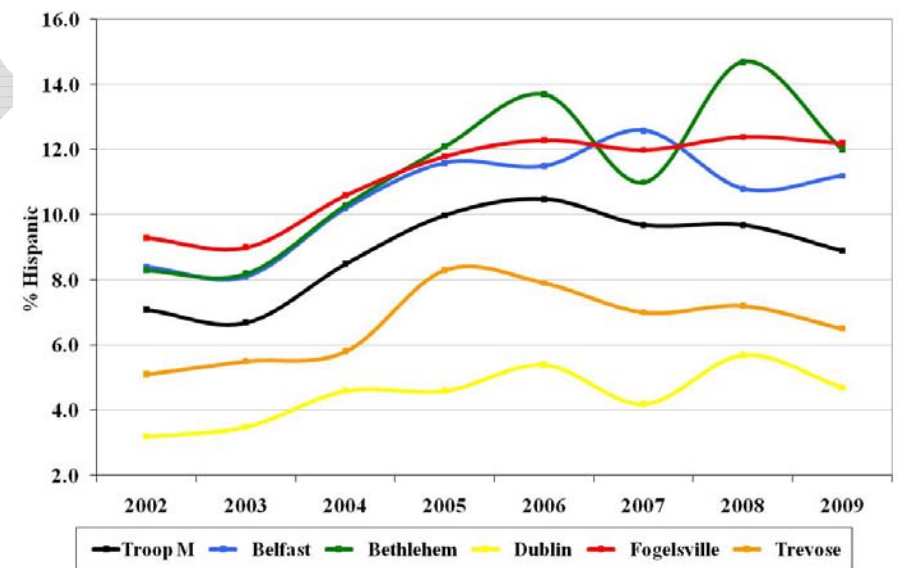
Figure 10:9: Percent of Traffic Stops Involving Black Drivers – Troop F
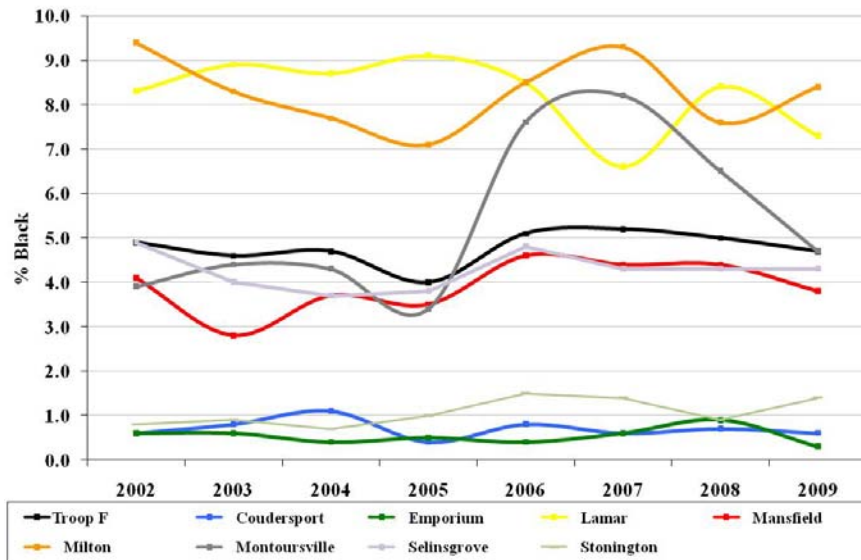
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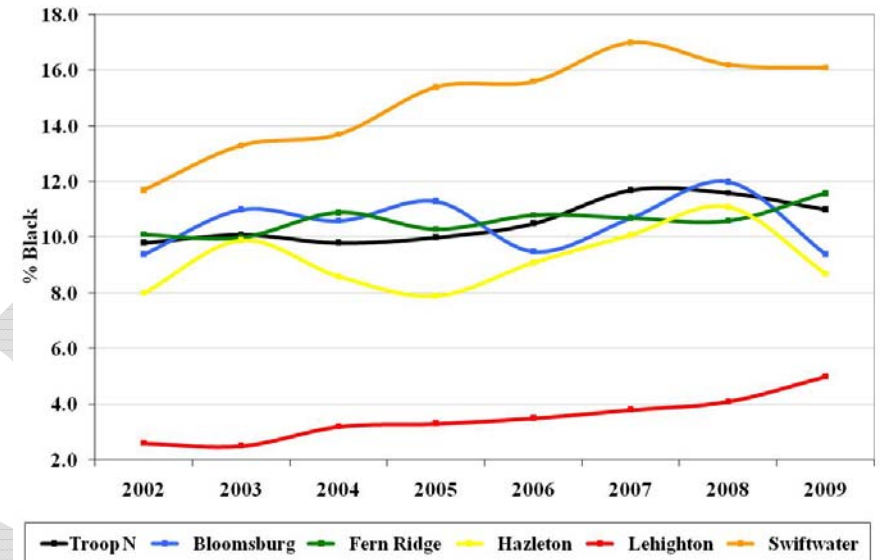
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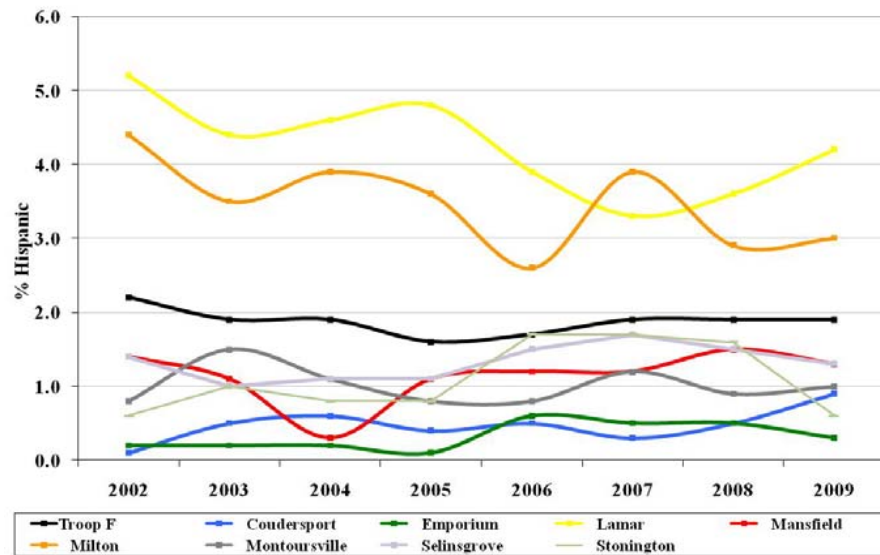
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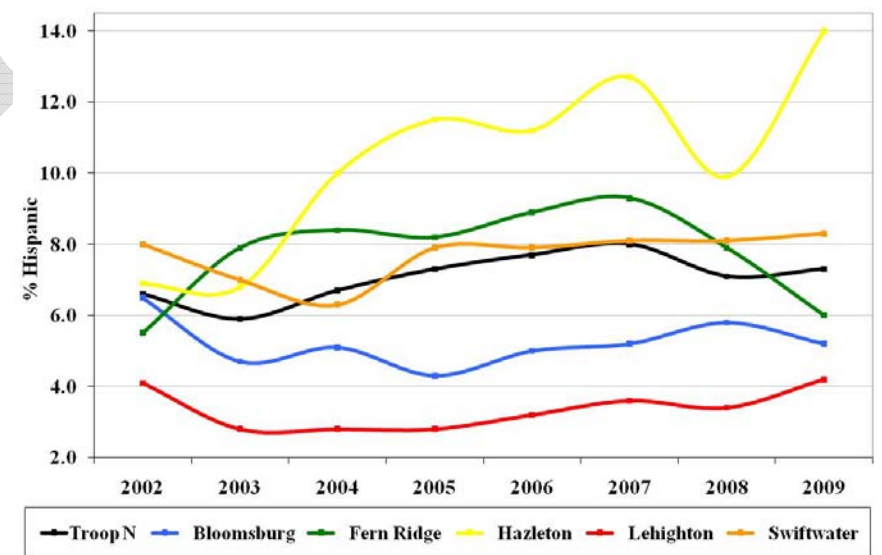
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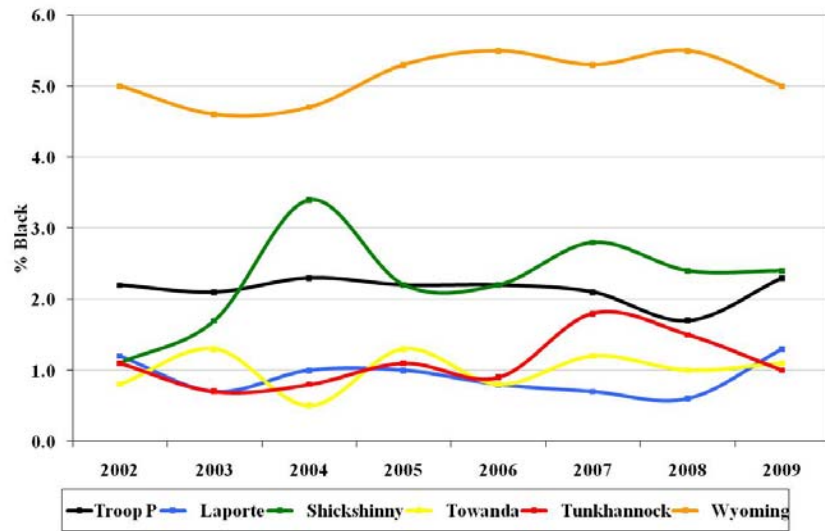
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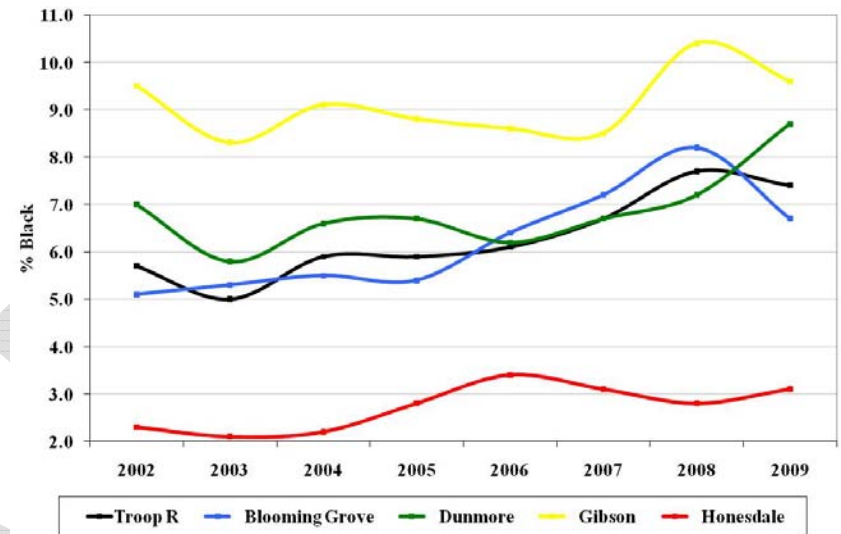
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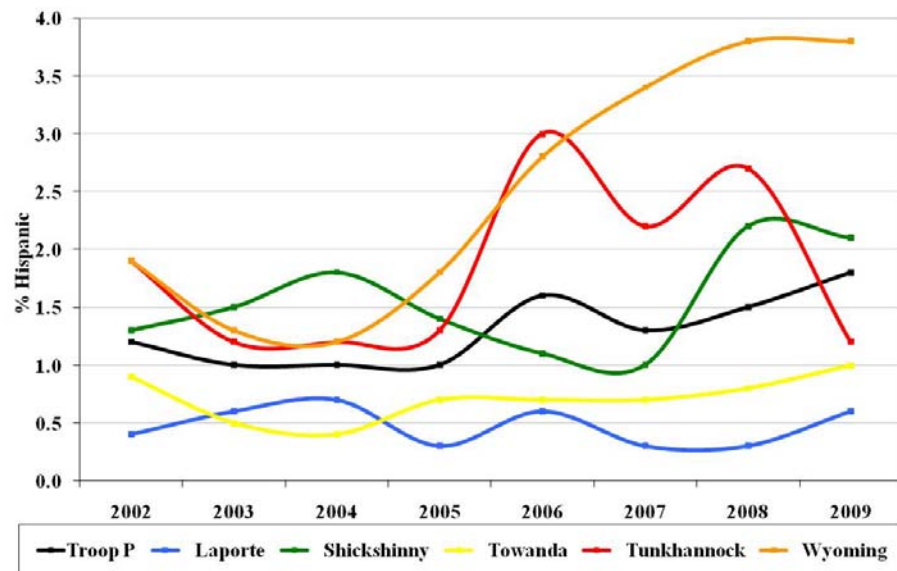
Figure 10:16: Percent of Traffic Stops Involving Hispanic Drivers – Troop R
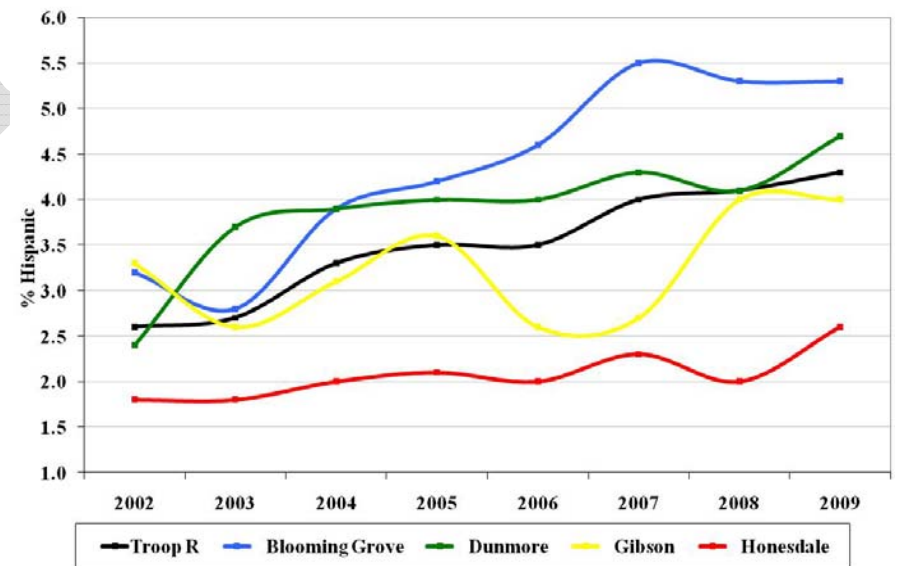
Figure 10:17: Percent of Traffic Stops Involving Black Drivers – Troop A

Figure 10:19: Percent of Traffic Stops Involving Black Drivers – Troop G
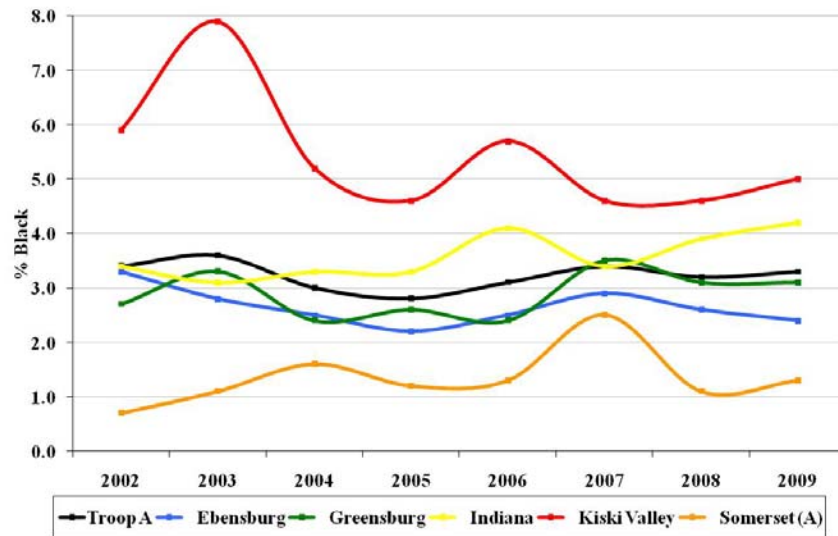
Figure 10:18: Percent of Traffic Stops Involving Hispanic Drivers – Troop A
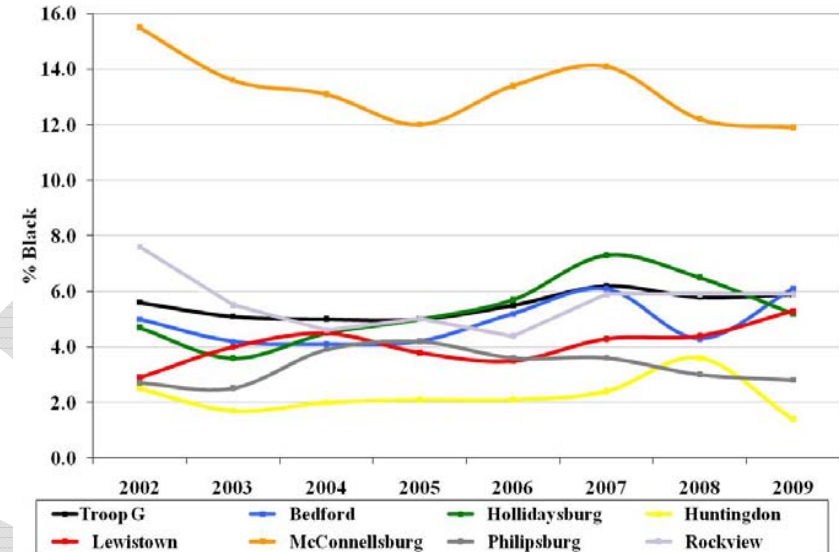
Figure 10:20: Percent of Traffic Stops Involving Hispanic Drivers – Troop G

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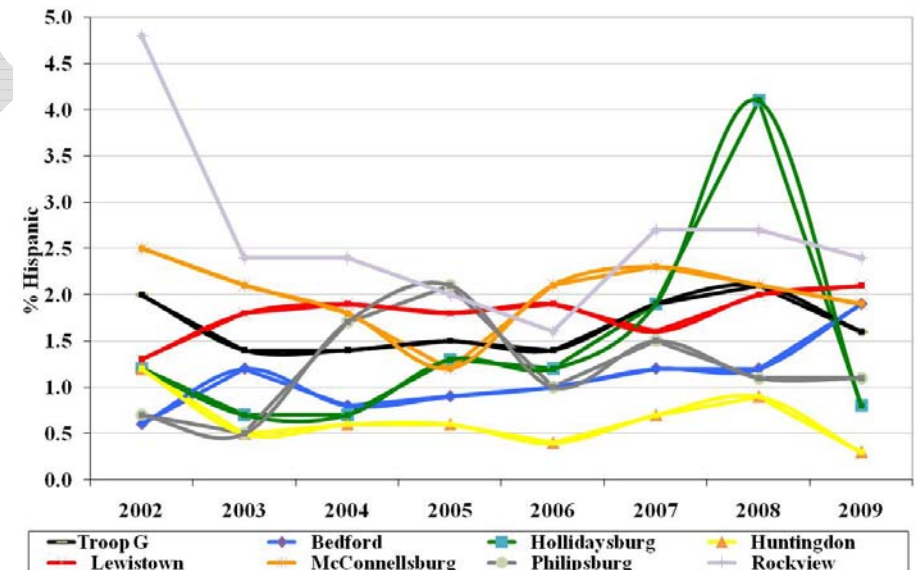
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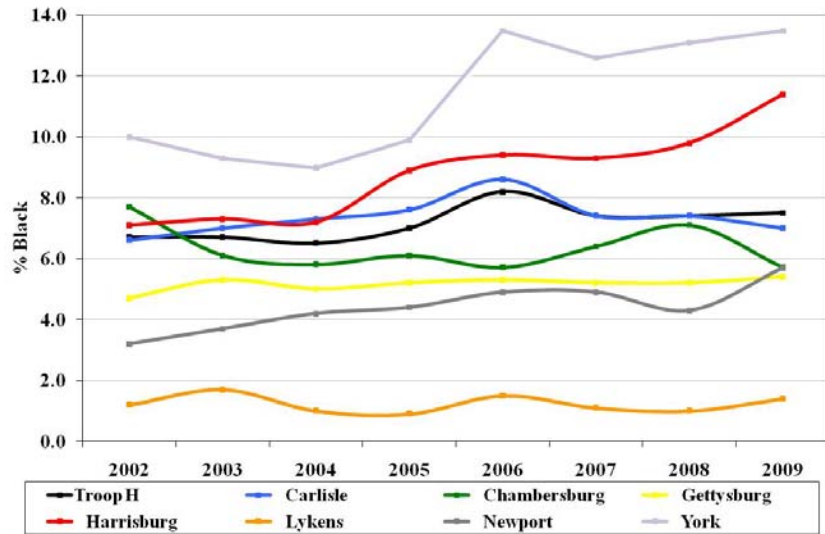
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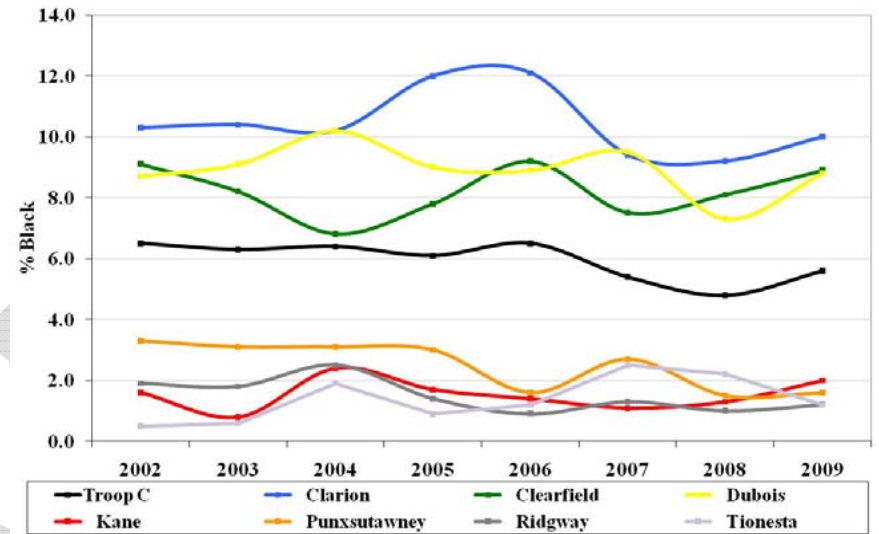
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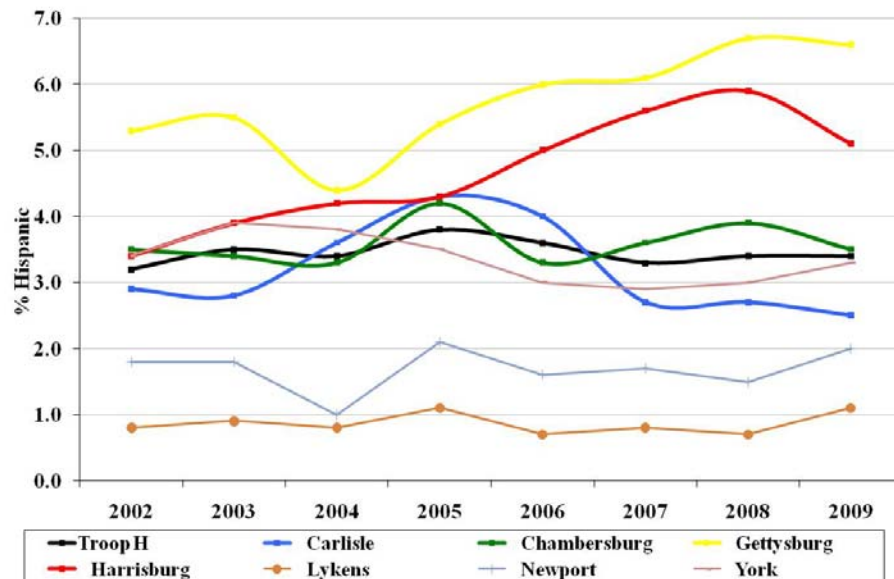
Figure 10:24: Percent of Traffic Stops Involving Hispanic Drivers – Troop C

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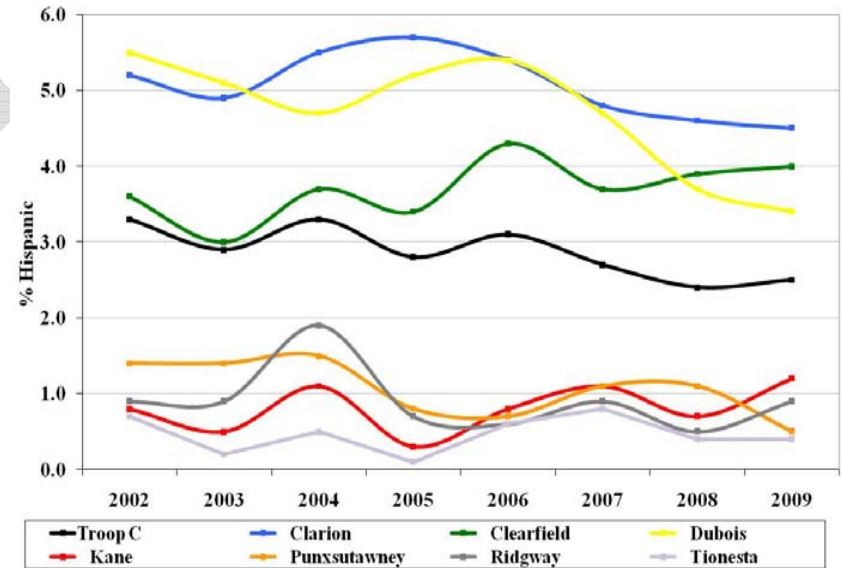
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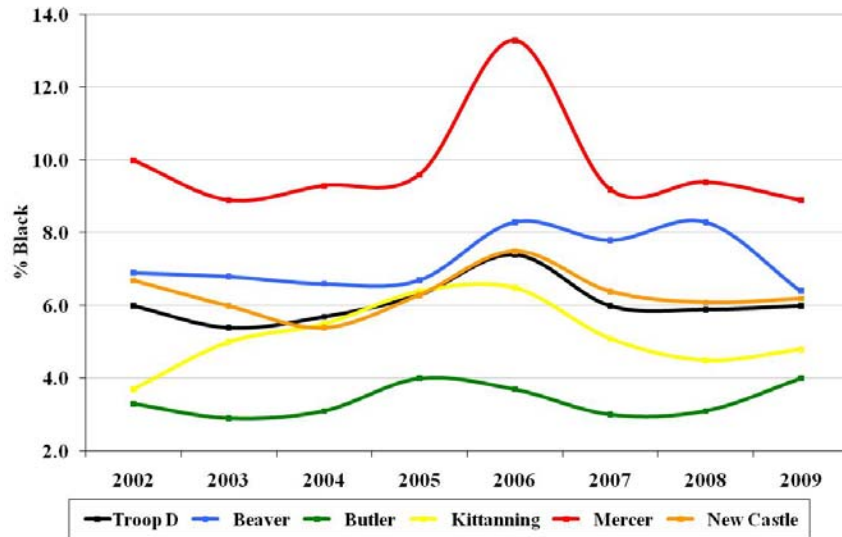
Figure 10:27: Percent of Traffic Stops Involving Black Drivers – Troop E
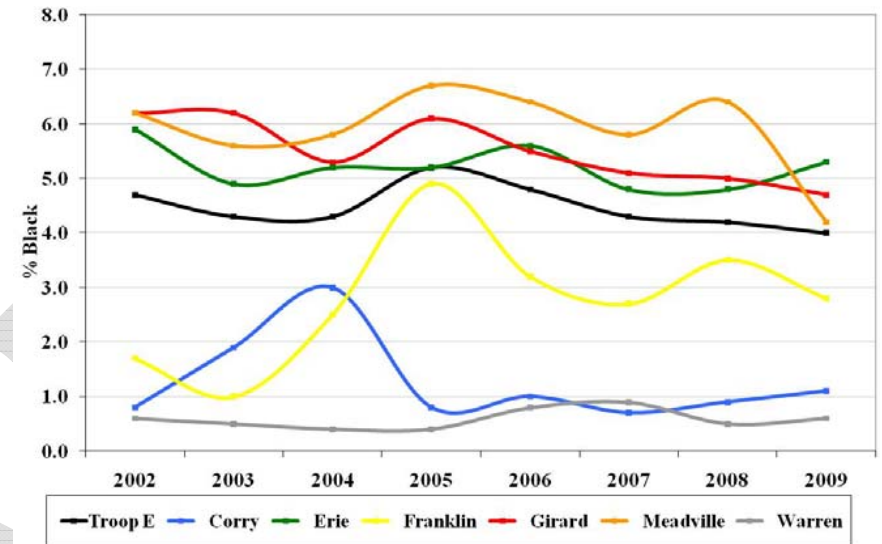
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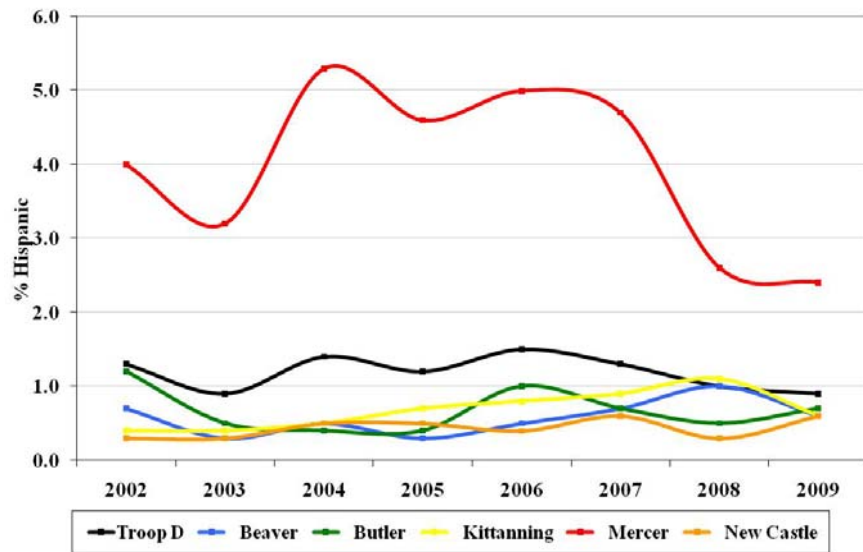
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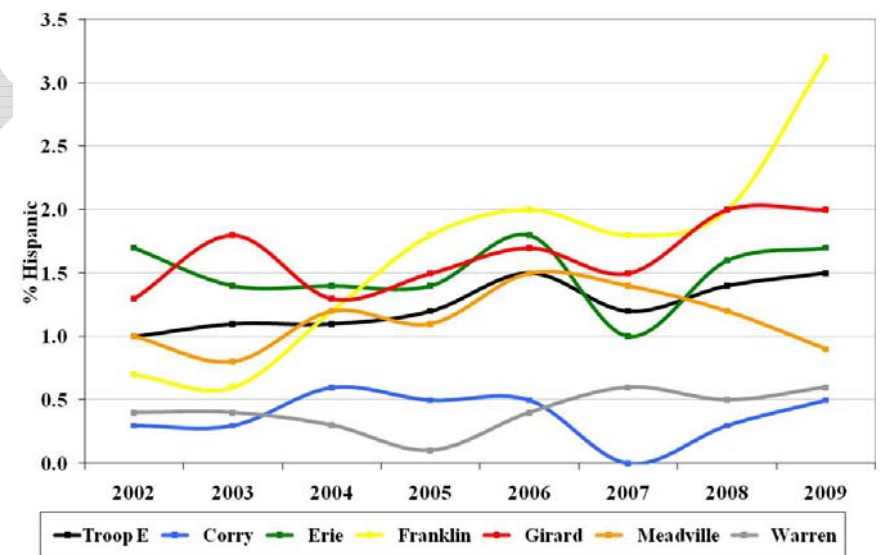
Figure 10:29: Percent of Traffic Stops Involving Black Drivers – Troop B

Figure 10:31: Percent of Traffic Stops Involving Black Drivers – Troop T
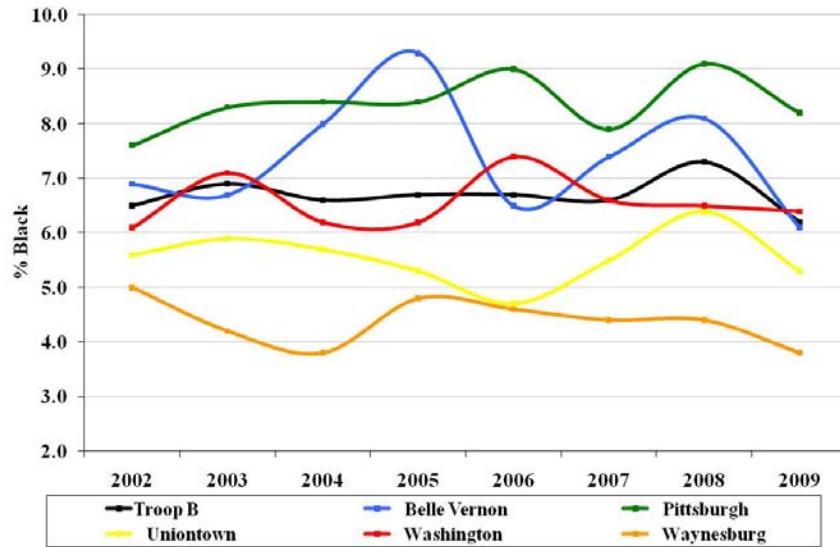
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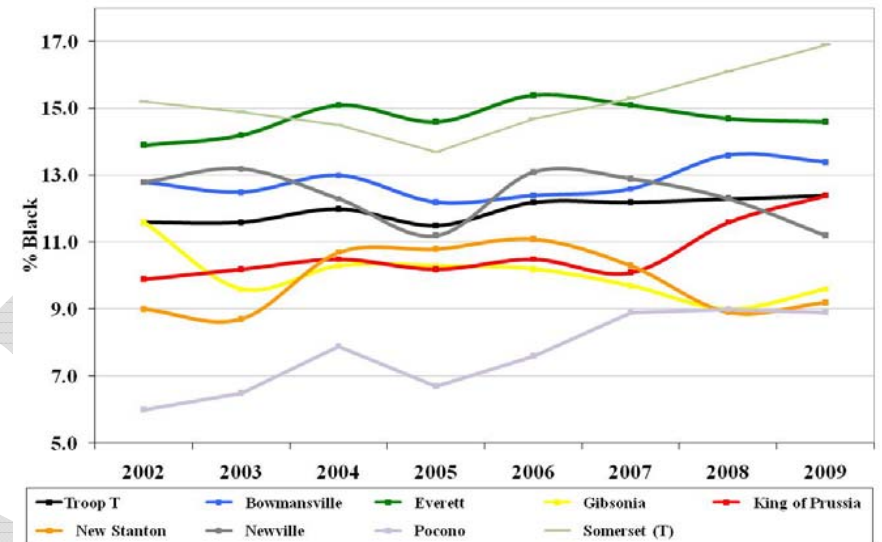
Figure 10:32: Percent of Traffic Stops Involving Hispanic Drivers – Troop T

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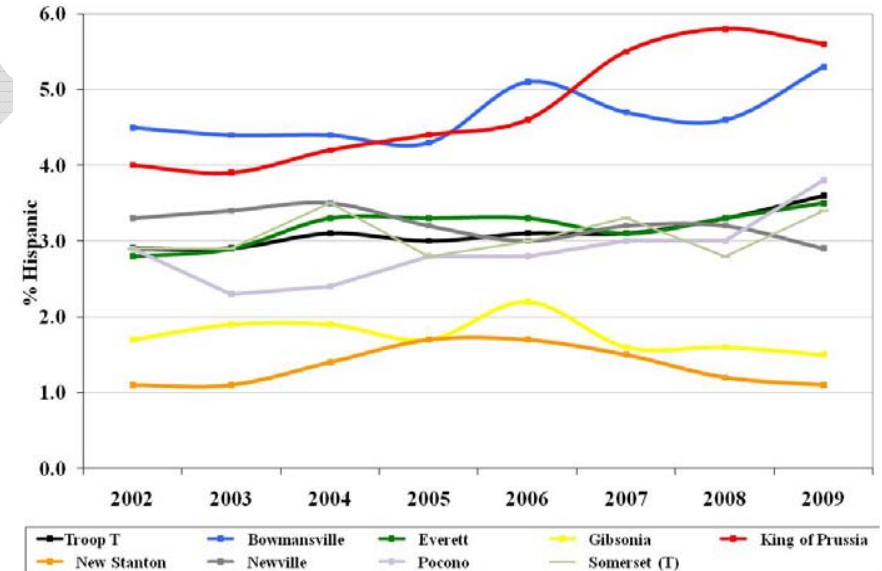
11. APPENDIX B: TRAFFIC STOP OUTCOMES 2002 – 2009 BY STATION

Appendix B provides a series of figures (Figures 11.1 – 11.64) reporting the rates of post-stop outcomes (e.g., warnings, citations, arrests, and searches) at the station level between 2002 and 2009. It is intended to supplement the information provided in Section 5. As described in Section 5, temporal analyses are best used to summarize the rate of activity (i.e., the rate of traffic stop outcomes of a selected group) within organizational units across time. This section exclusively uses this type of analysis to compare the rate of traffic stop outcomes of Black and Hispanic citizens within one organizational unit. In this manner, the rates from year to year in a jurisdiction are comparable. In effect, differences between organizational units are considered in these analyses and do not influence the results. As a result, the strength of documenting temporal trends is to examine differences within organizational units across time.

The research team purposefully does not offer a value assessment of the 2009 rate in relation to the seven-year average. In other words, the research team does not assign a "cutoff value" for an acceptable rate of traffic stop outcomes. The graphs demonstrating temporal values are strictly a tool to assess trends over time in the rate of traffic stop outcomes and to identify organizational units that are experiencing noticeable increases in their rate of traffic stop outcomes of Black or Hispanic drivers. There are numerous factors beyond the scope of this methodology that may be directly related to changes in the rate of traffic stop outcomes. For example:
- changes in the traffic population within that jurisdiction
- alterations to the reporting patterns by PSP troopers
- adjustments in PSP traffic stop behaviors
- differences in deployment patterns across time
- modifications of manpower allocation

Any single factor or a combination of these factors may influence the rate of traffic stop outcomes of minority drivers in any year and result in an increase or decrease in the rates reported in the graphs below. The following graphs are to be interpreted with caution and cannot be used as evidence of overt biased policing by the PSP or any of its organizational units; however, they do offer a basic picture of the traffic stop outcome trends by organizational unit. Any significant changes in post-stop outcomes within organizational units should be further examined by PSP administrators to determine the likely source of such changes.

For the trends in arrests and searches during traffic stops, it is important to remember that, prior to 2006 there were some data inconsistencies for these outcomes. As documented in the *2003-2004 Final Report*, during focus groups conducted with PSP Troopers in August 2005, it was discovered that there were some problems associated with the ongoing data collection project. Specifically, it became apparent that not all Troopers were completing the Contact Data Reports during all member-initiated stops and were, in particular, underreporting traffic stops resulting in arrests and/or searches that resulted in the discovery of contraband. Upon discovery of these discrepancies, the PSP immediately addressed and corrected these issues. Nevertheless, based on the known problems of underreporting of arrests and searches, firm conclusions regarding trends in these outcomes cannot be made.
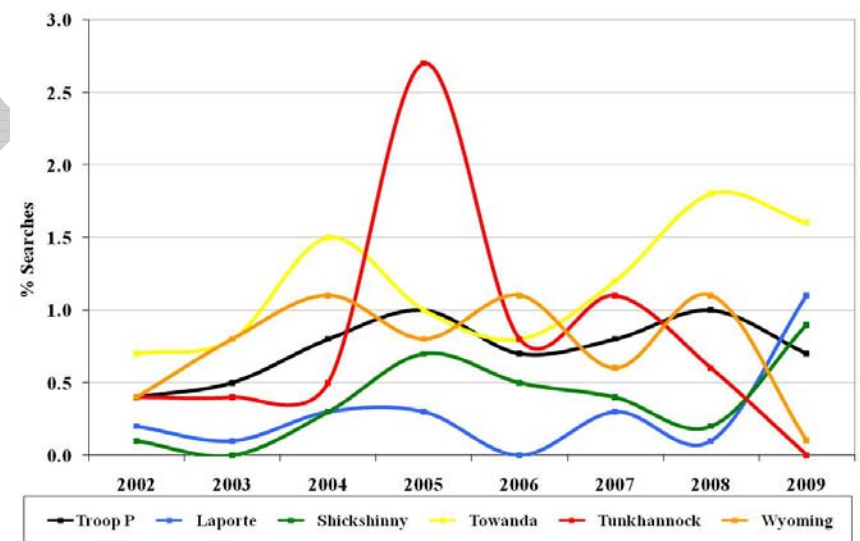
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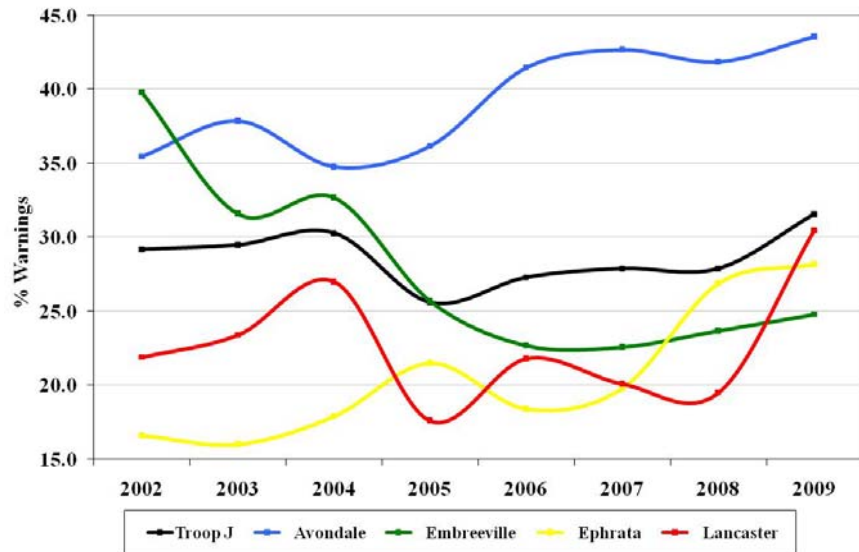
Figure 11:3: Percent of Traffic Stops Resulting in an Arrest – Troop J
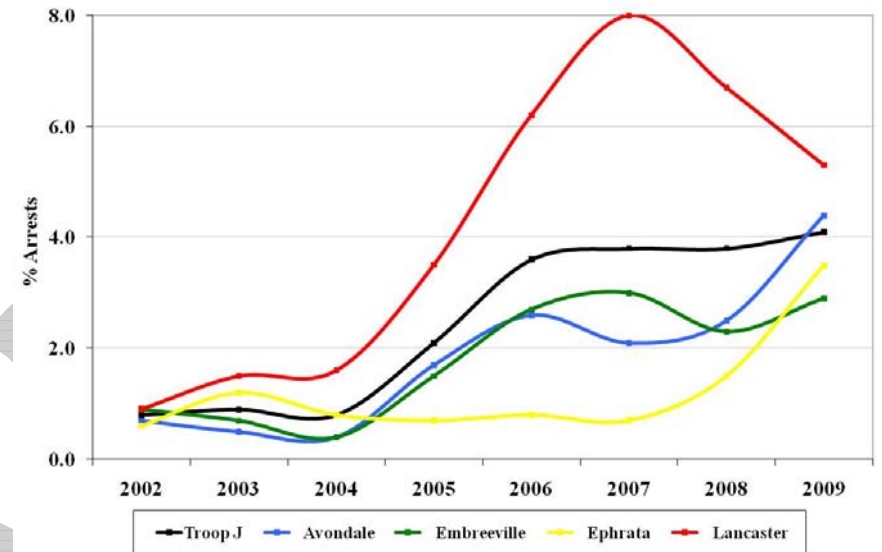
Figure 11:2: Percent of Traffic Stops Resulting in a Citation – Troop J
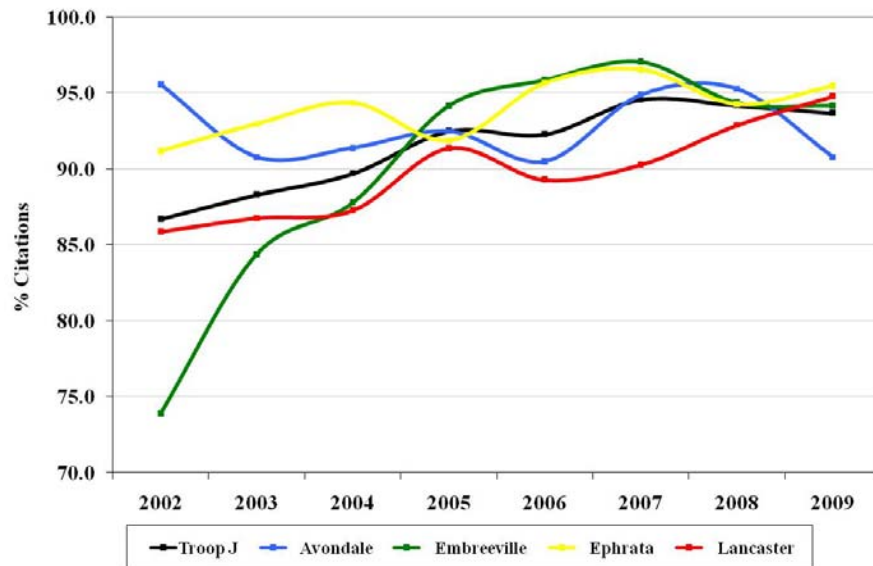
Figure 11:4: Percent of Traffic Stops Resulting in a Search – Troop J

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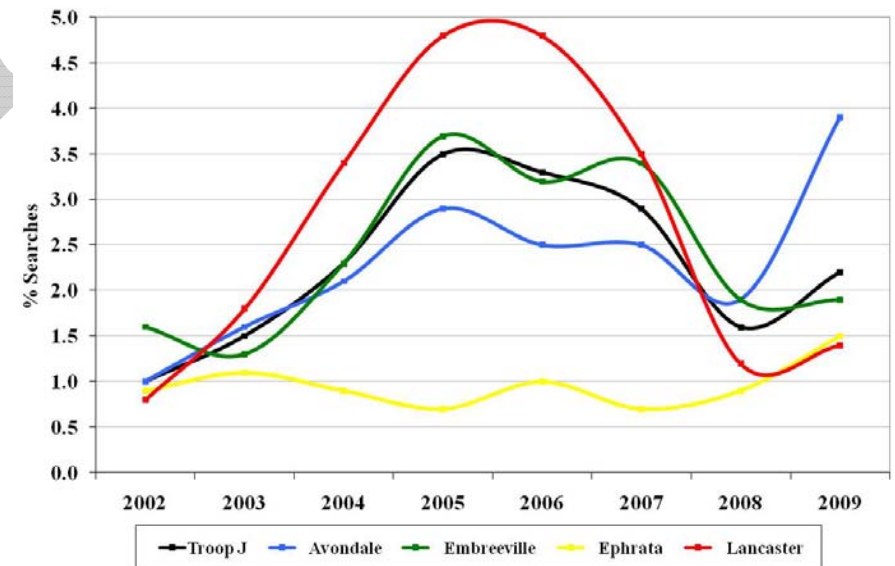
Figure 11:5: Percent of Traffic Stops Resulting in a Warning – Troop K
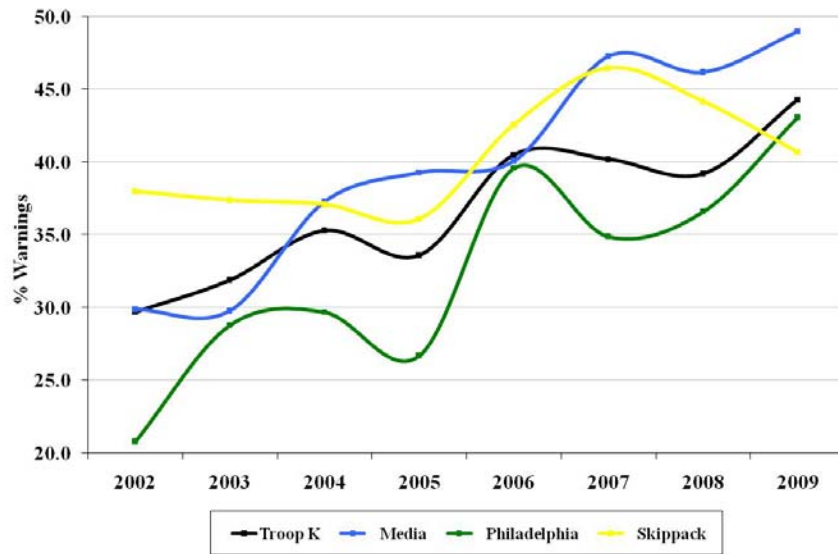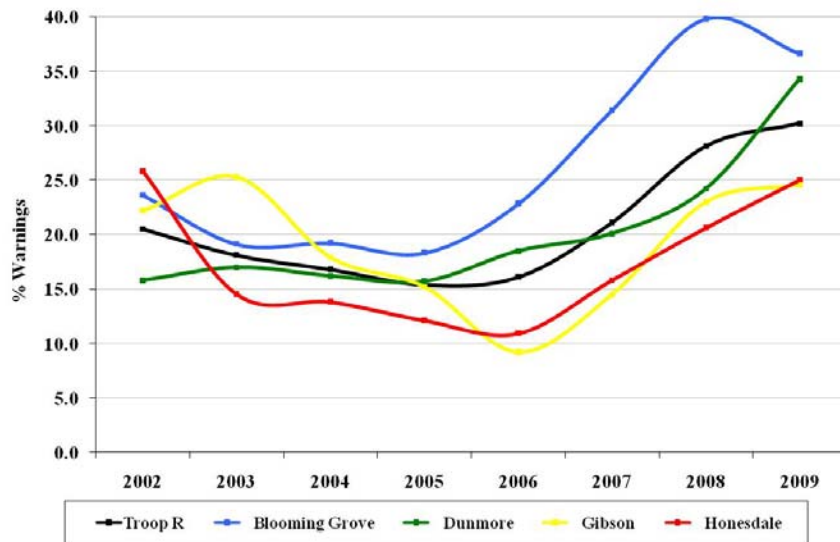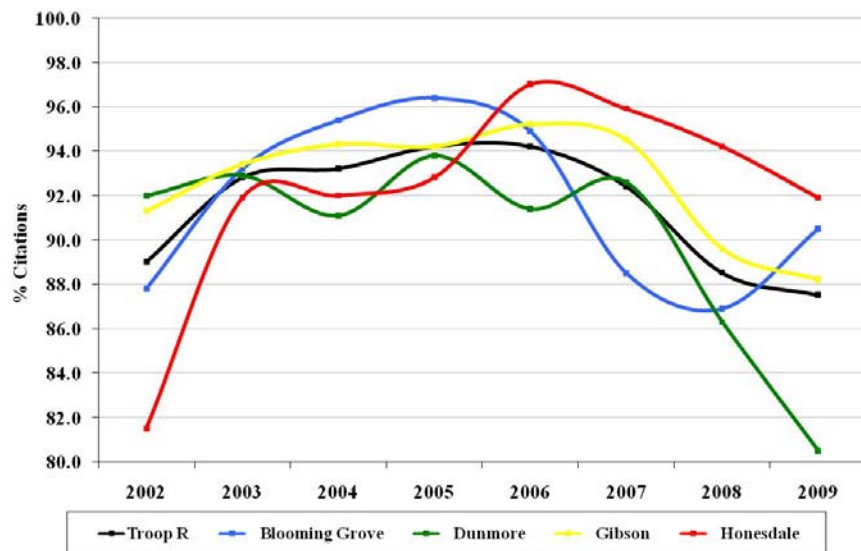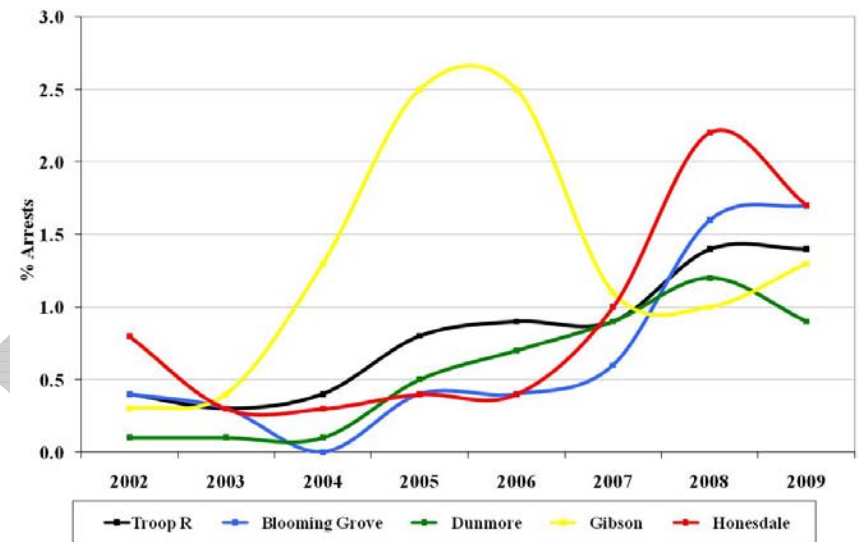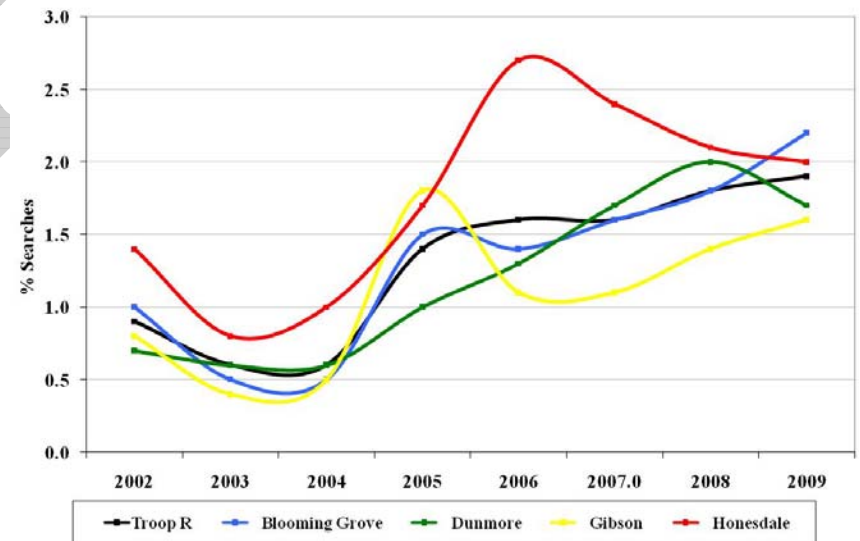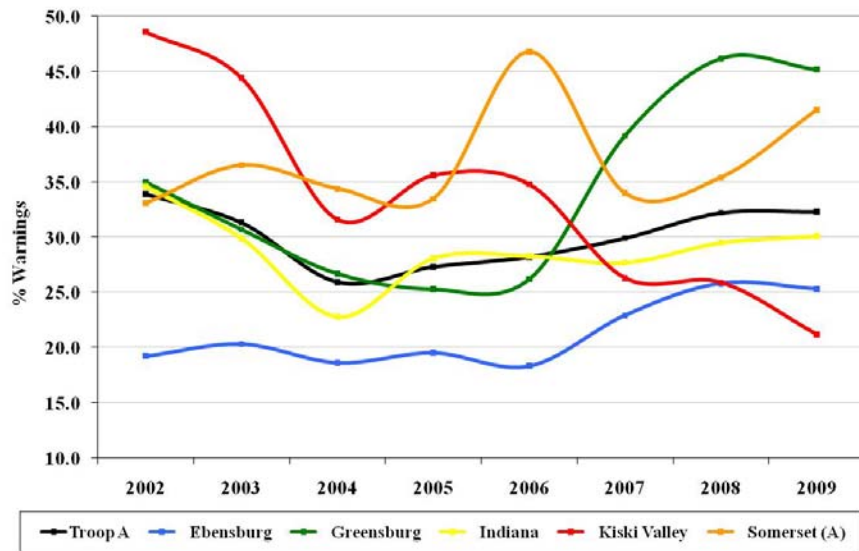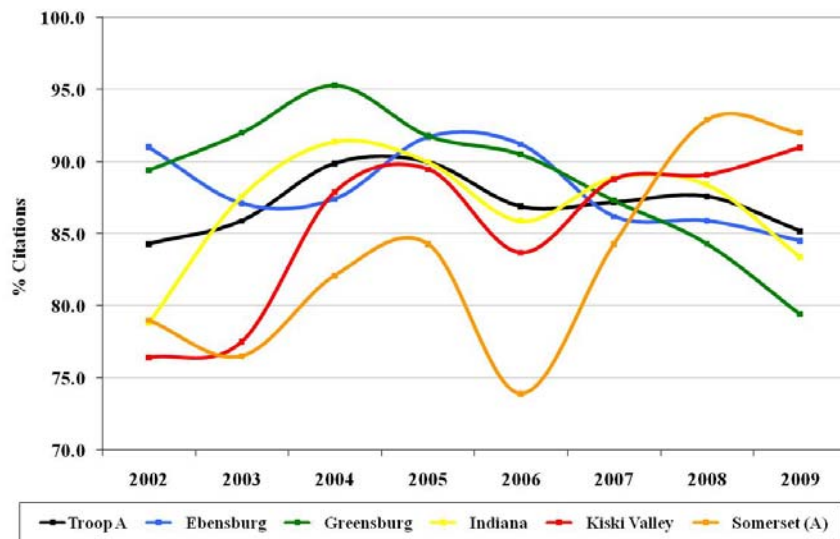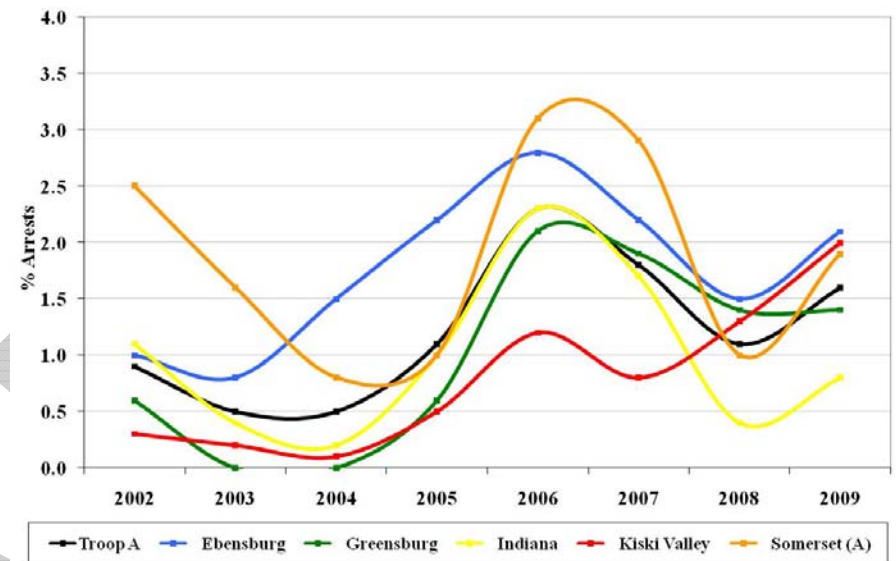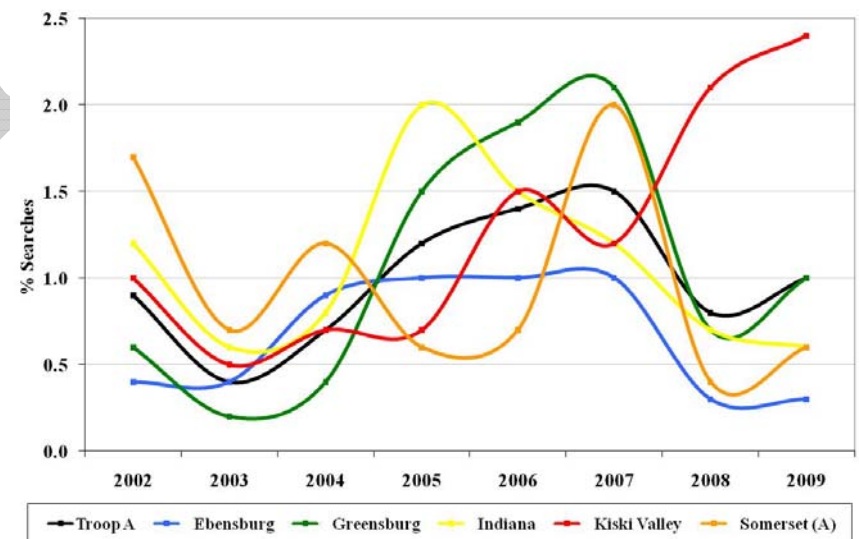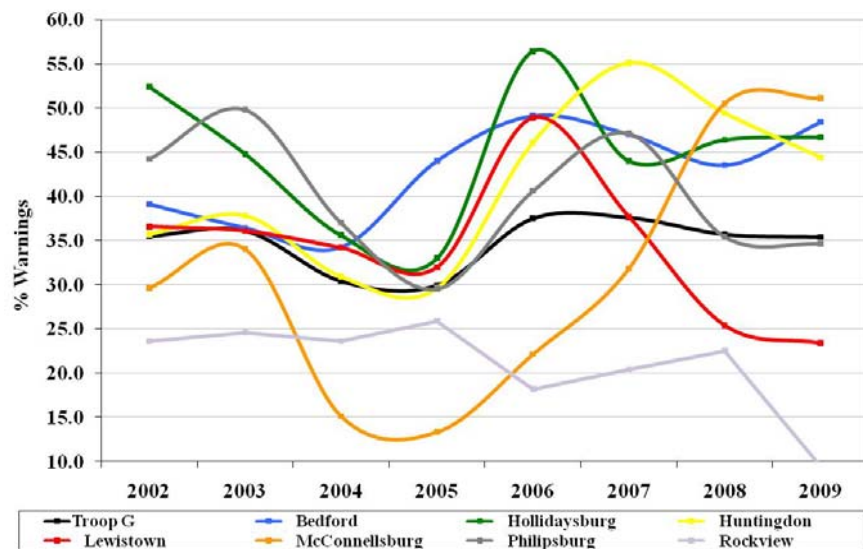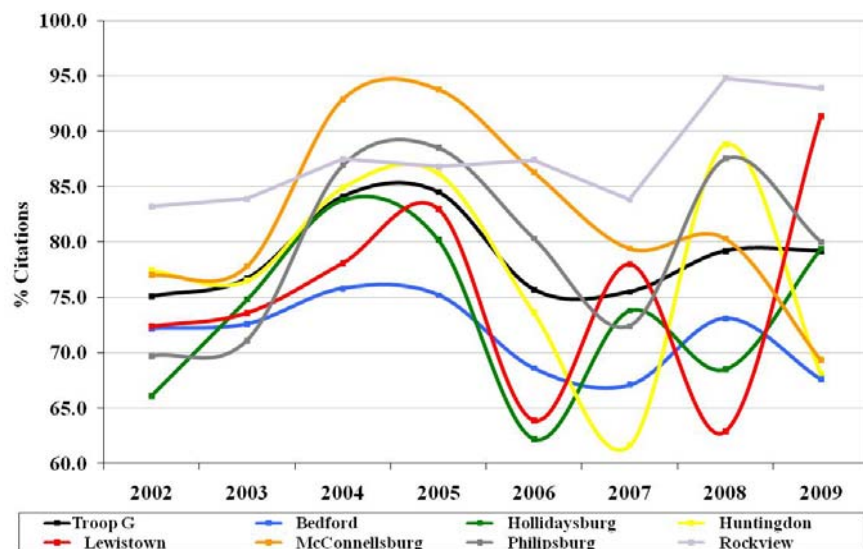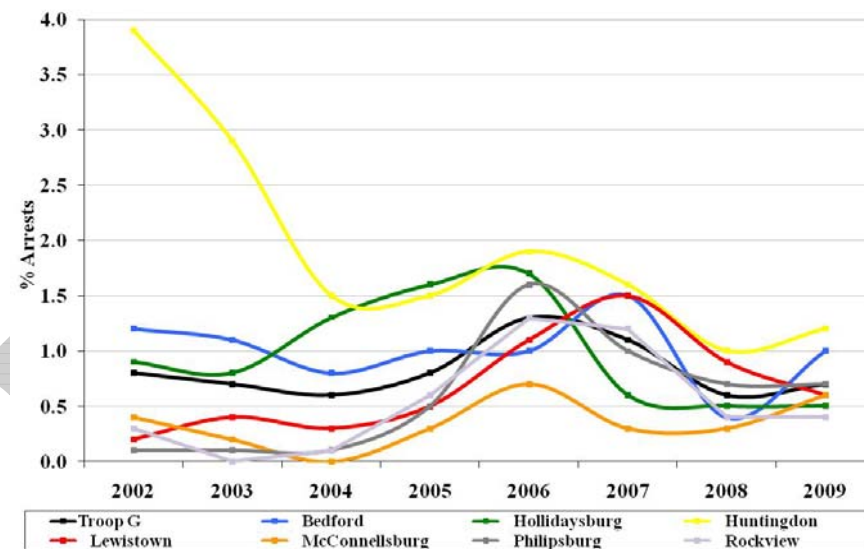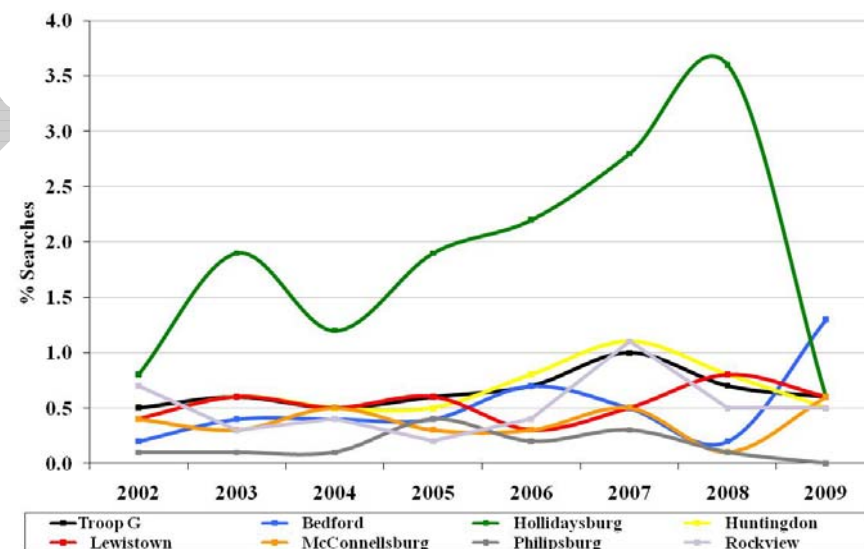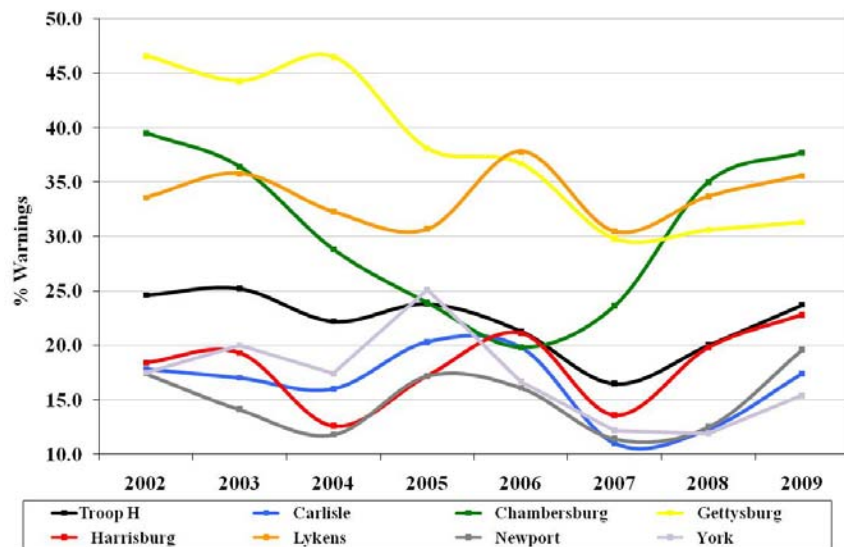

Figure 11:6: Percent of Traffic Stops Resulting in a Citation – Troop K
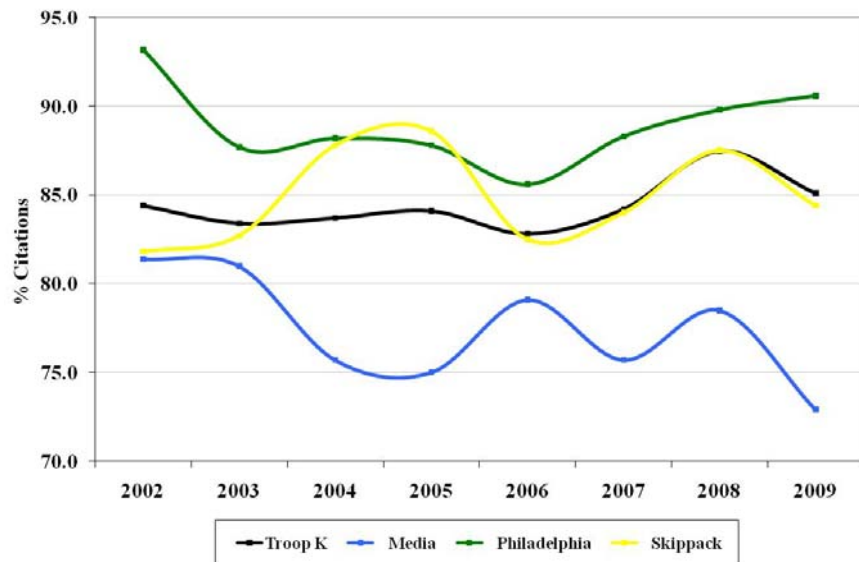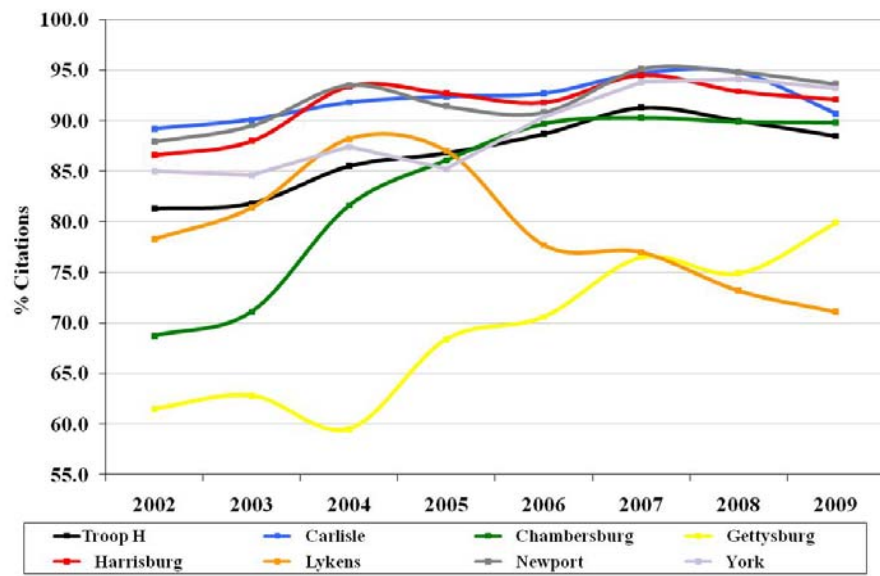

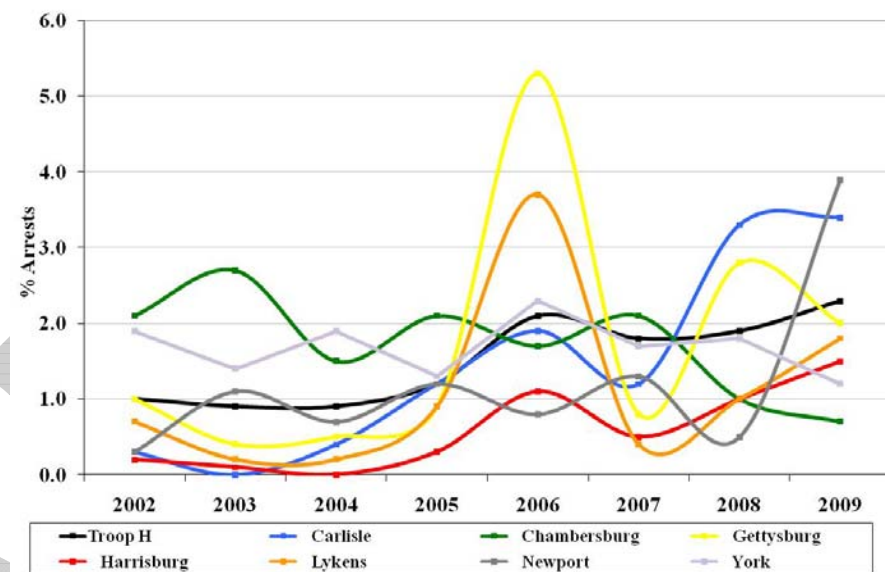**Figure 11:7: Percent of Traffic Stops Resulting in an Arrest – Troop K**
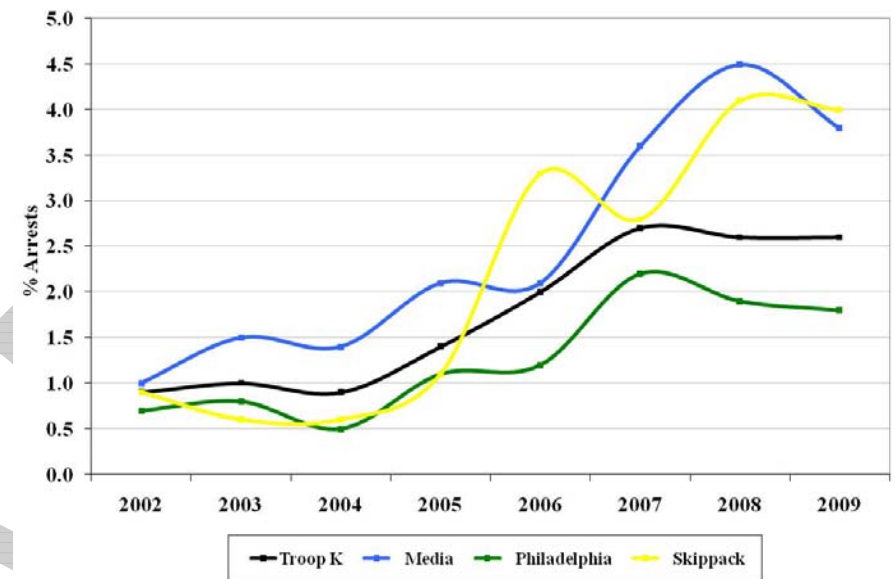
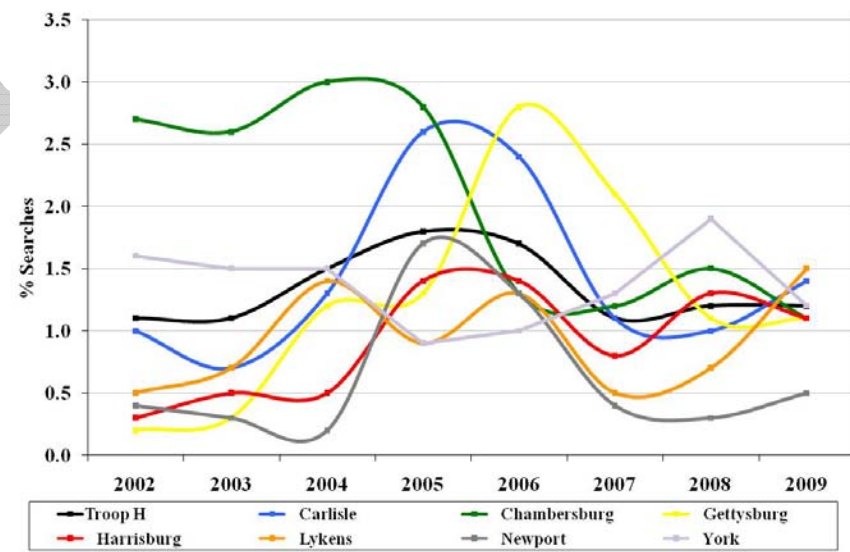**Figure 11:8: Percent of Traffic Stops Resulting in a Search – Troop K**
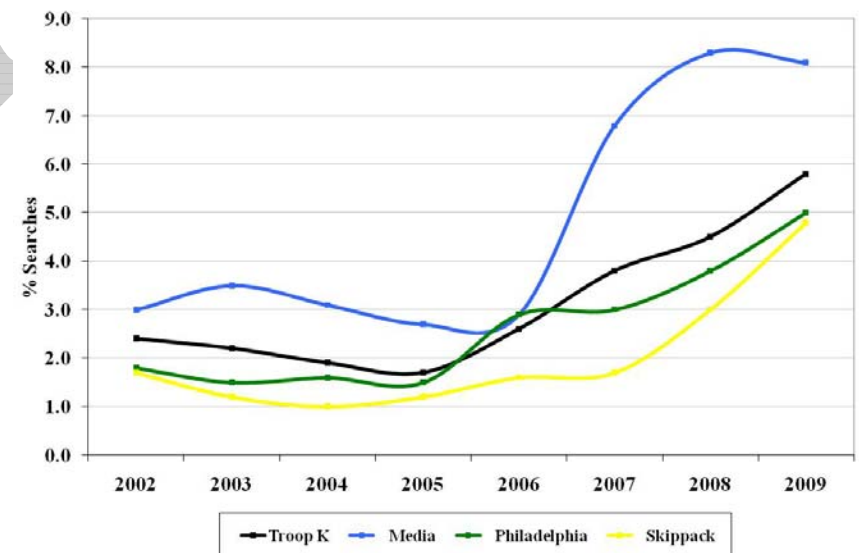
Figure 11:9: Percent of Traffic Stops Resulting in a Warning – Troop L

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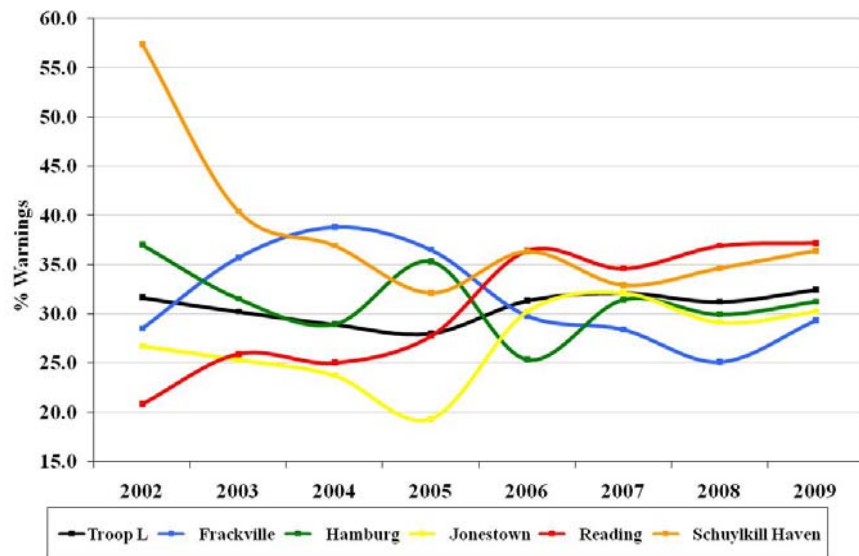
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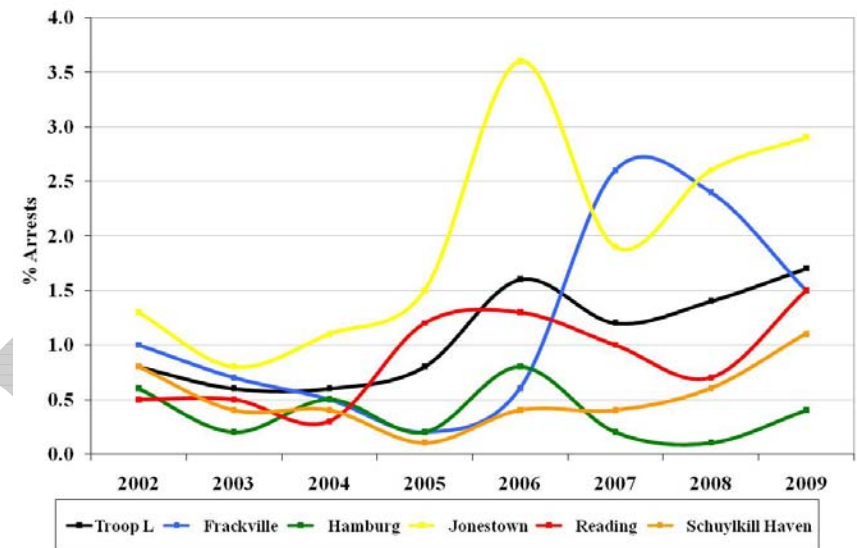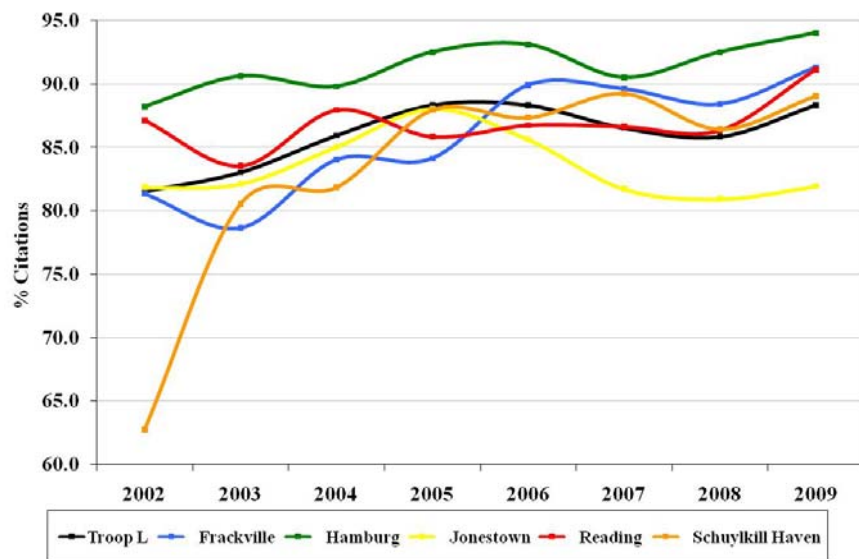
Figure 11:12: Percent of Traffic Stops Resulting in a Search – Troop L

Figure 11:11: Percent of Traffic Stops Resulting in an Arrest – Troop L
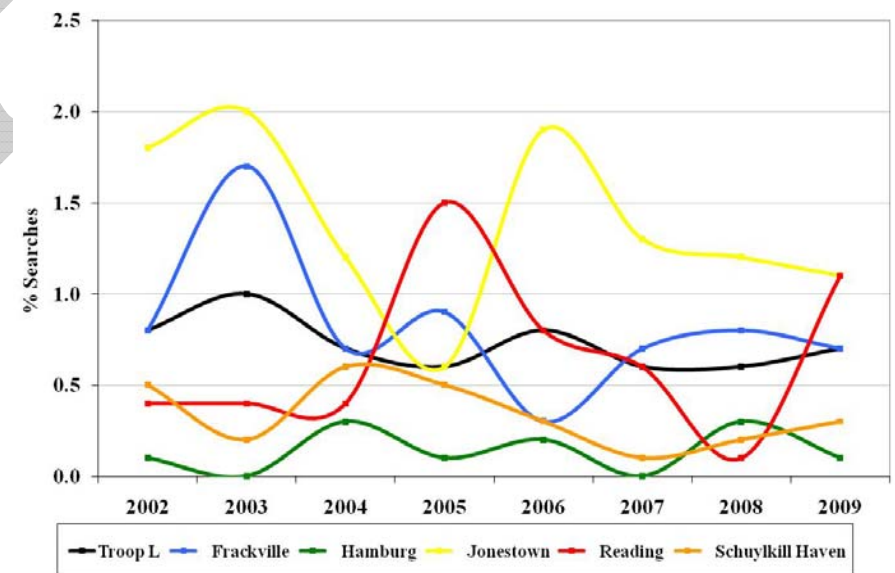
Figure 11:13: Percent of Traffic Stops Resulting in a Warning – Troop M

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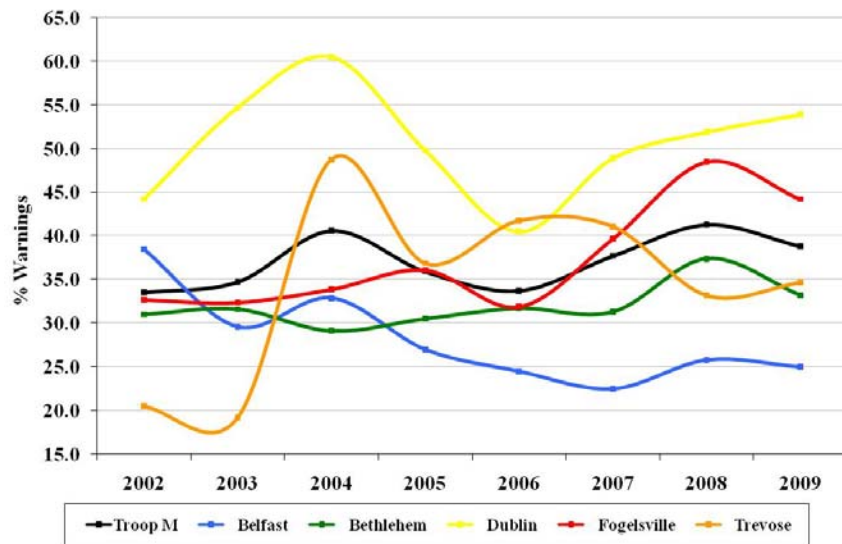
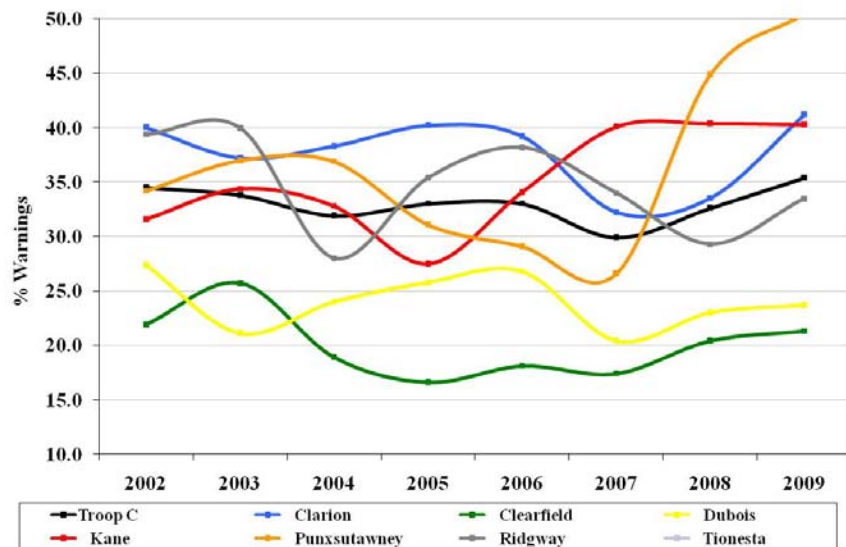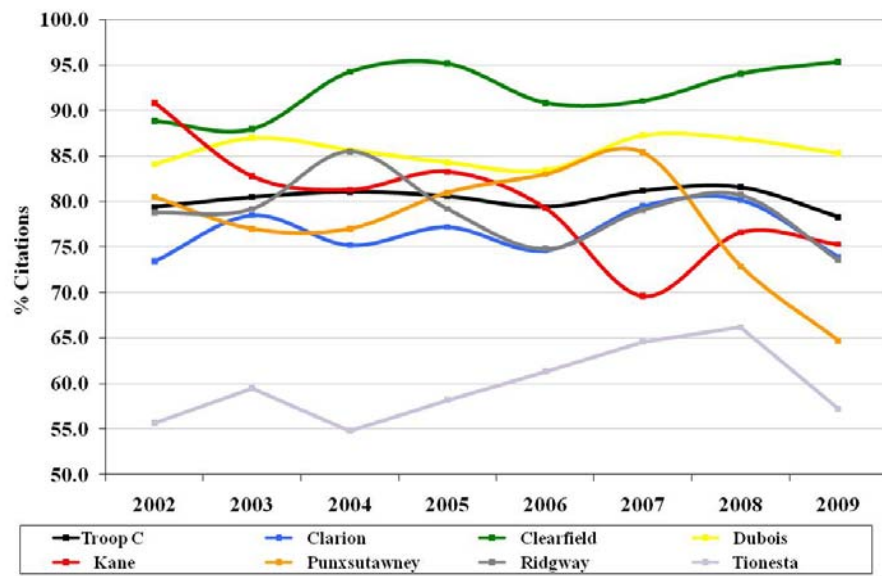**Figure 11:14: Percent of Traffic Stops Resulting in a Citation – Troop M**

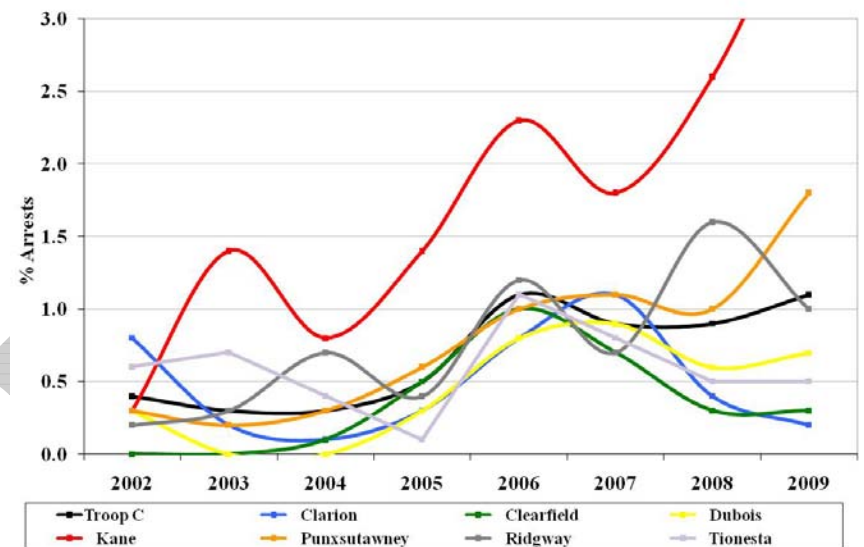**Figure 11:16: Percent of Traffic Stops Resulting in a Search – Troop M**

Figure 11:15: Percent of Traffic Stops Resulting in an Arrest – Troop M
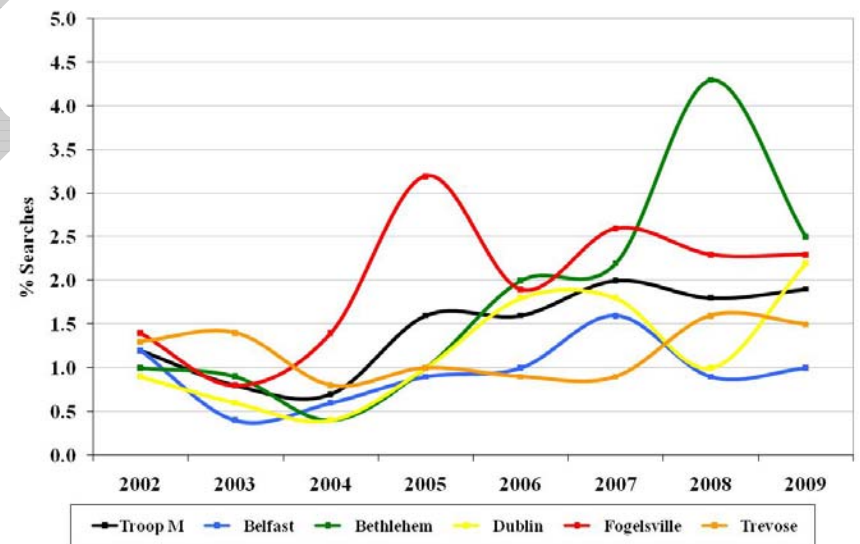
Figure 11:17: Percent of Traffic Stops Resulting in a Warning – Troop F
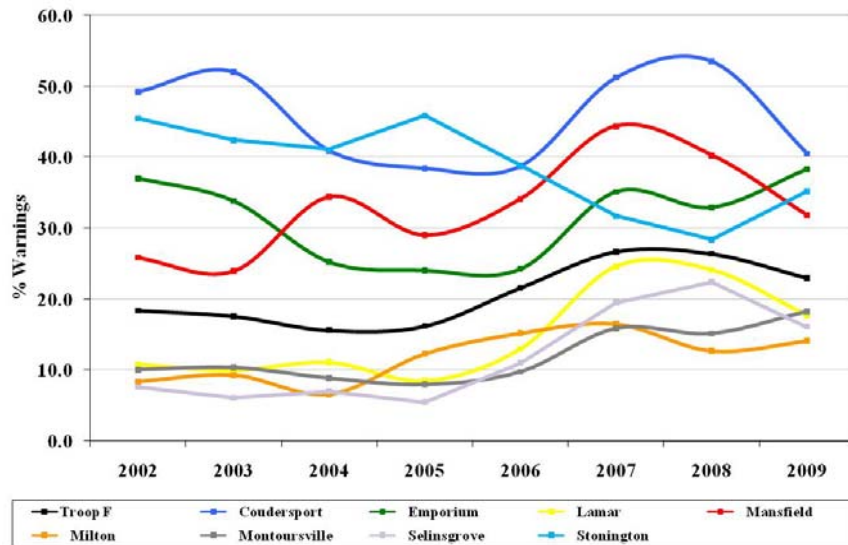
Figure 11:18: Percent of Traffic Stops Resulting in a Citation – Troop F

Figure 11:20: Percent of Traffic Stops Resulting in a Search – Troop F

Figure 11:19: Percent of Traffic Stops Resulting in an Arrest – Troop F
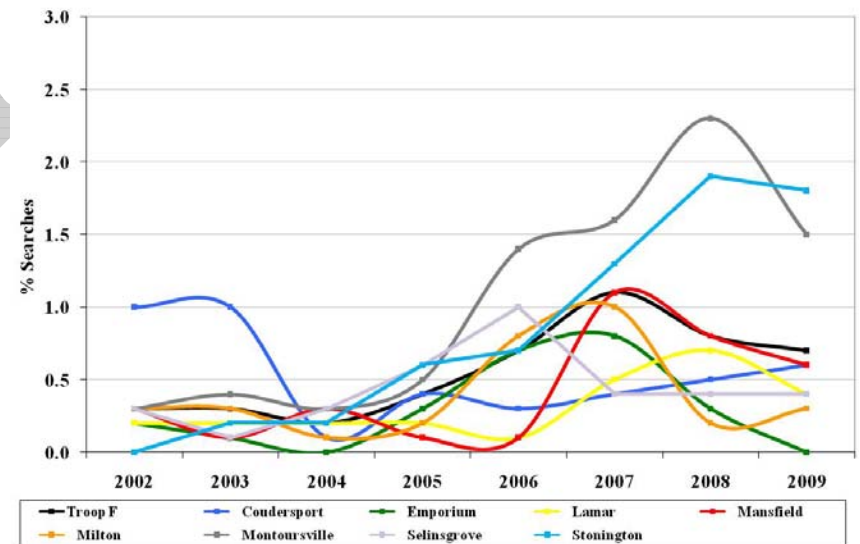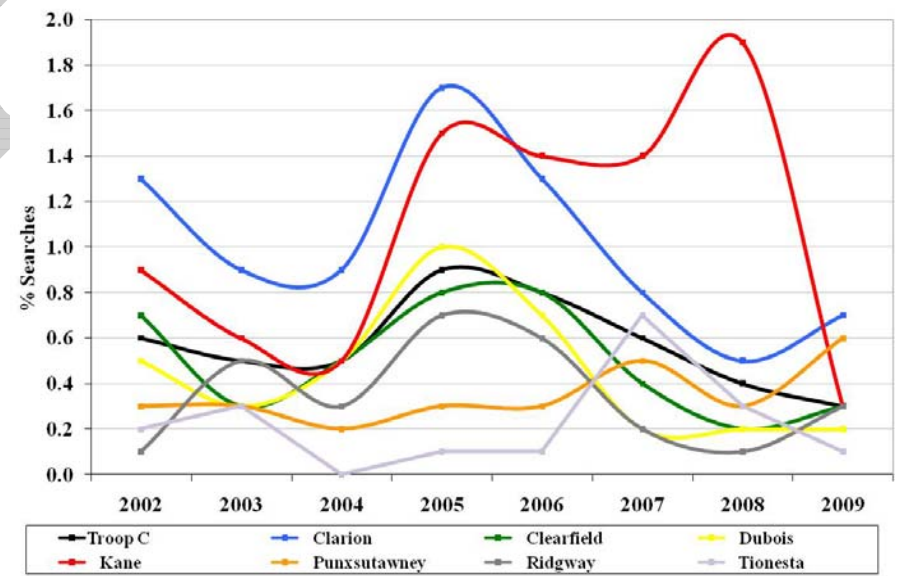

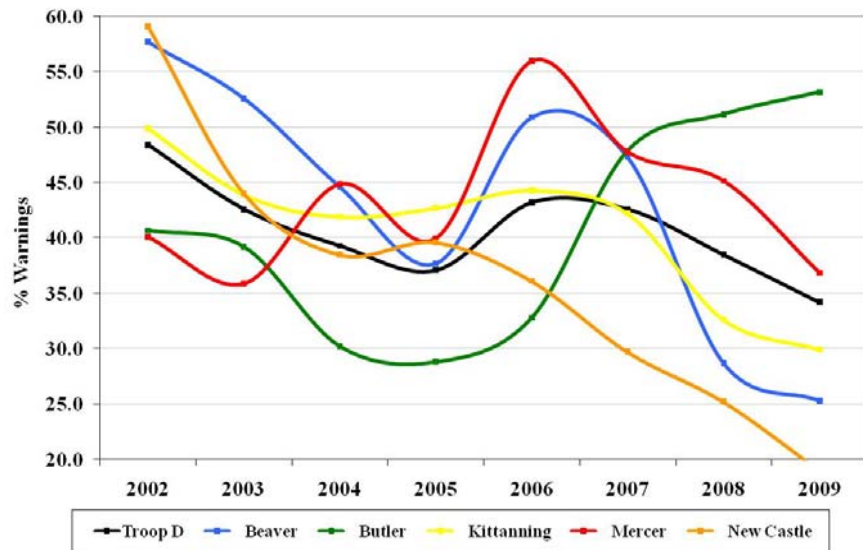**Figure 11:21: Percent of Traffic Stops Resulting in a Warning – Troop N**

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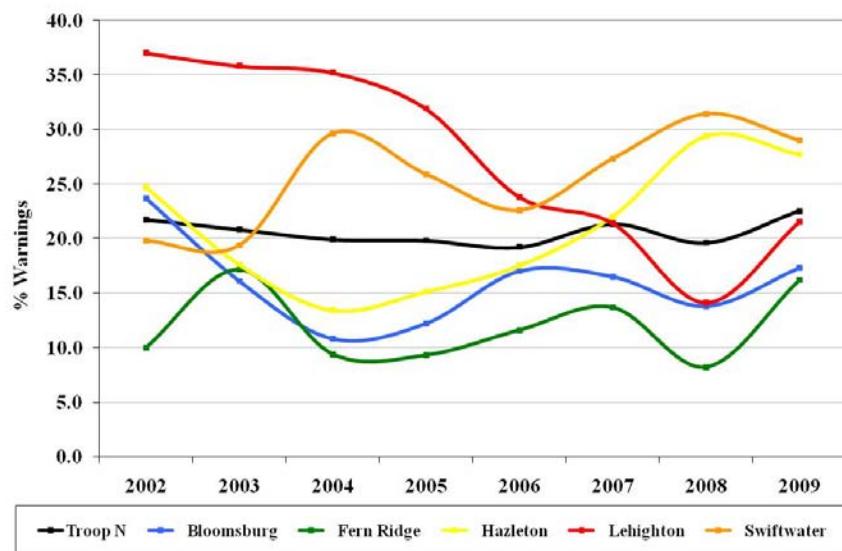
Figure 11:22: Percent of Traffic Stops Resulting in a Citation – Troop N

Figure 11:24: Percent of Traffic Stops Resulting in a Search – Troop N

Figure 11:23: Percent of Traffic Stops Resulting in an Arrest – Troop N
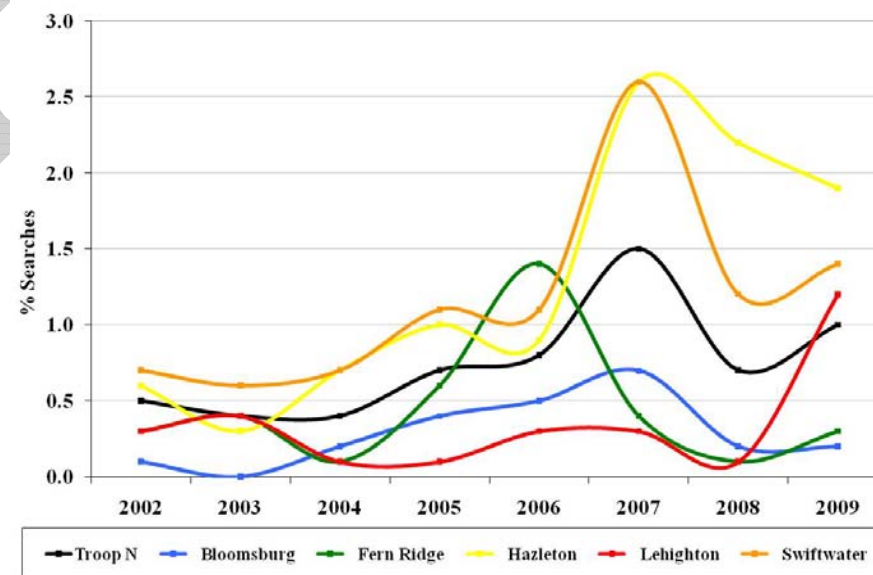
Figure 11:25: Percent of Traffic Stops Resulting in a Warning – Troop P

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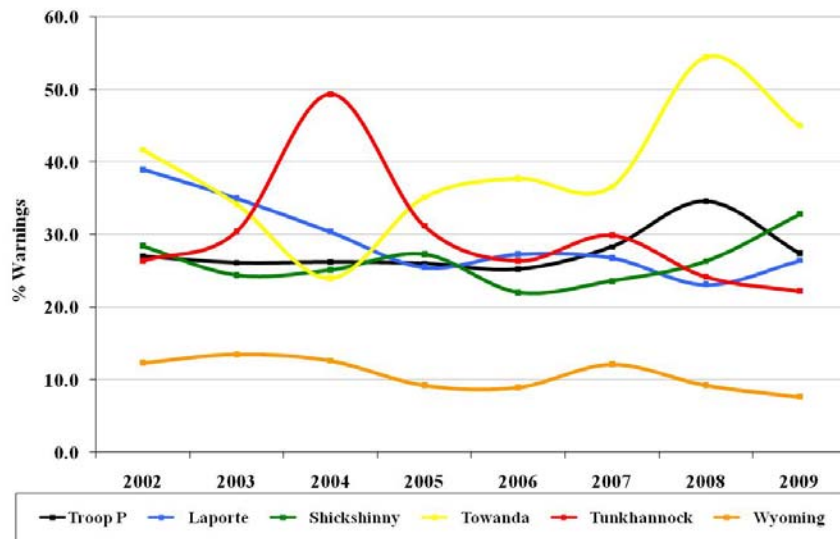
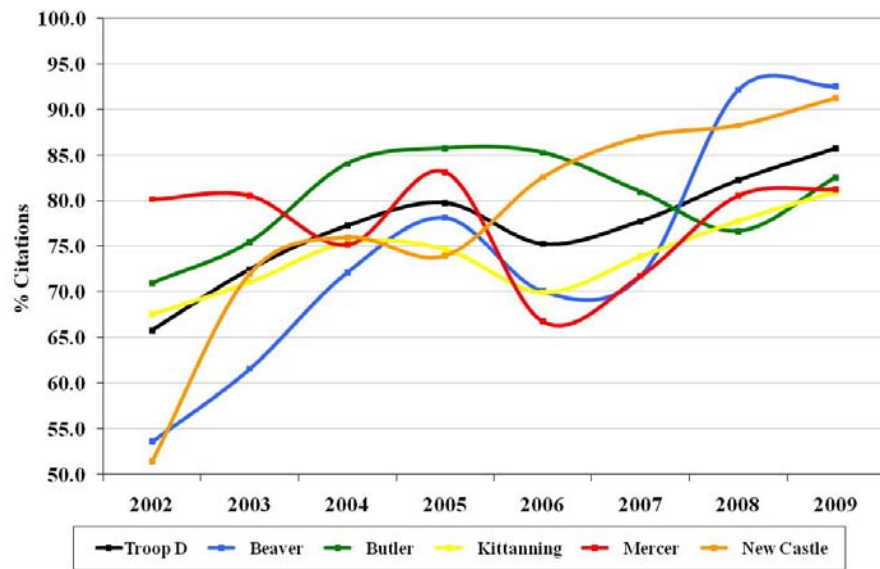**Figure 11:26: Percent of Traffic Stops Resulting in a Citation – Troop P**

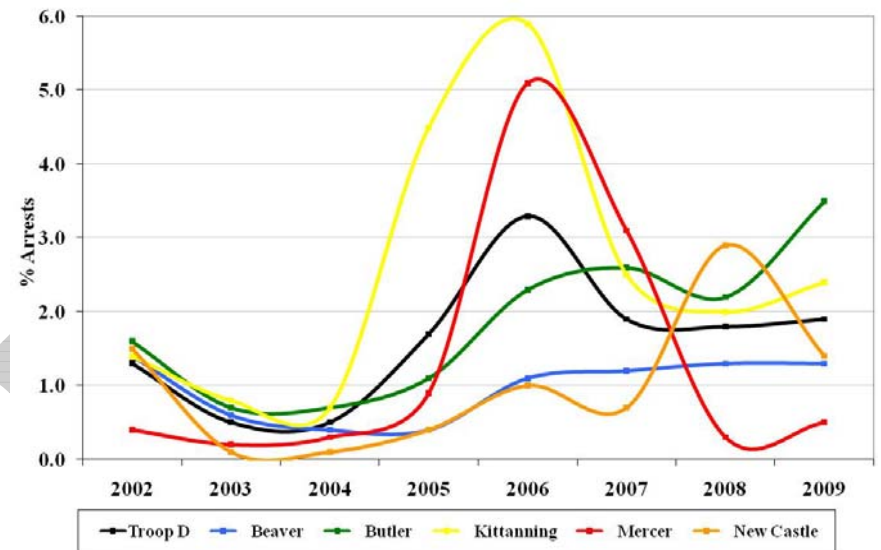**Figure 11:28: Percent of Traffic Stops Resulting in a Search – Troop P**

Figure 11:27: Percent of Traffic Stops Resulting in an Arrest – Troop P

Figure 11:29: Percent of Traffic Stops Resulting in a Warning – Troop R

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Figure 11:30: Percent of Traffic Stops Resulting in a Citation – Troop R

Figure 11:32: Percent of Traffic Stops Resulting in a Search – Troop R

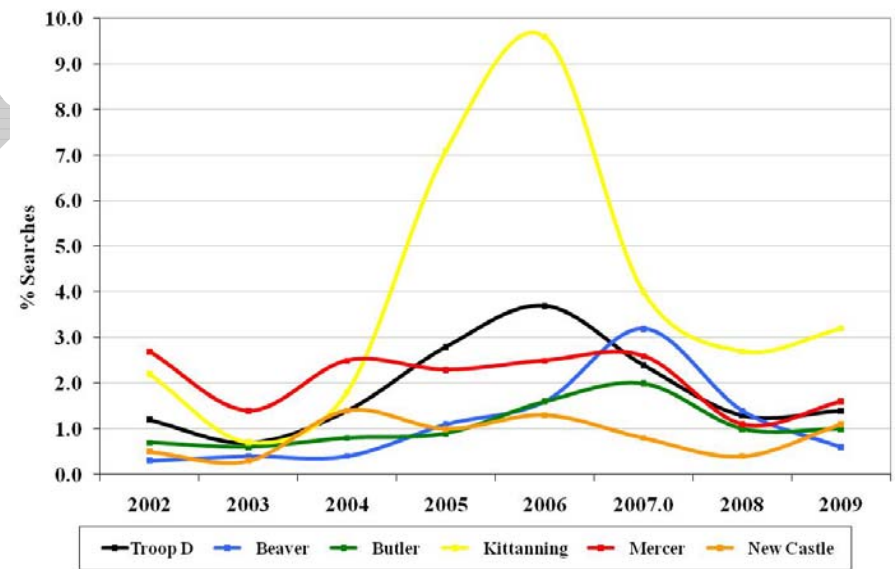**Figure 11:31: Percent of Traffic Stops Resulting in an Arrest – Troop R**

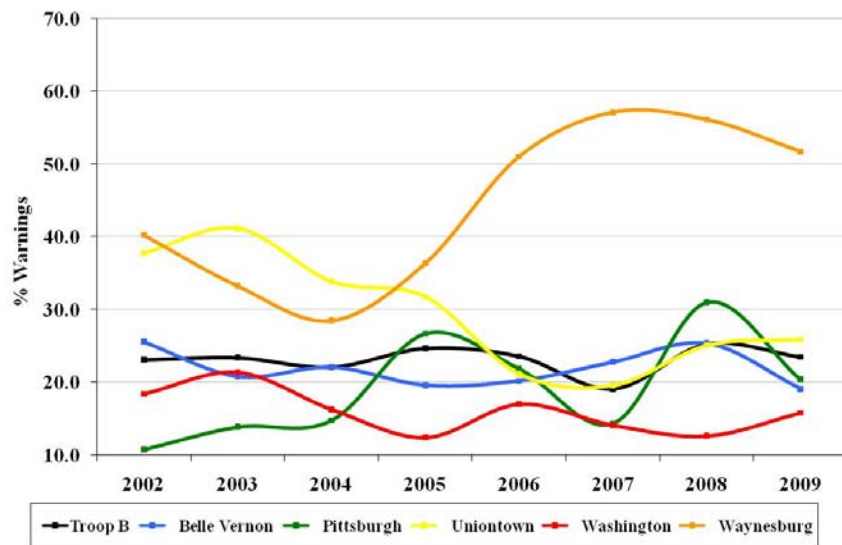**Figure 11:33: Percent of Traffic Stops Resulting in a Warning – Troop A**

Figure 11:34: Percent of Traffic Stops Resulting in a Citation – Troop A

Figure 11:36: Percent of Traffic Stops Resulting in a Search – Troop A

Figure 11:35: Percent of Traffic Stops Resulting in an Arrest – Troop A

Figure 11:37: Percent of Traffic Stops Resulting in a Warning – Troop G

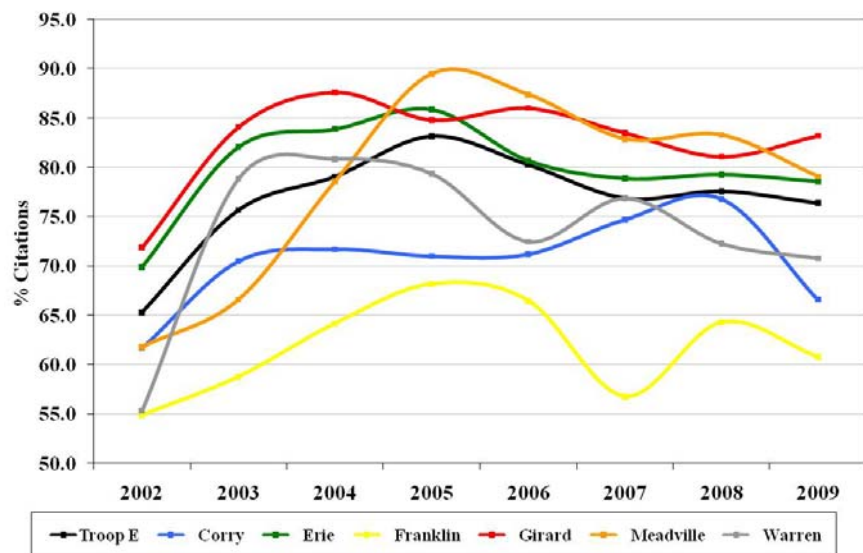**Figure 11:38: Percent of Traffic Stops Resulting in a Citation – Troop G**

Figure 11:40: Percent of Traffic Stops Resulting in a Search – Troop G

Figure 11:39: Percent of Traffic Stops Resulting in an Arrest – Troop G

Figure 11:41: Percent of Traffic Stops Resulting in a Warning – Troop H

Figure 11:42: Percent of Traffic Stops Resulting in a Citation – Troop H

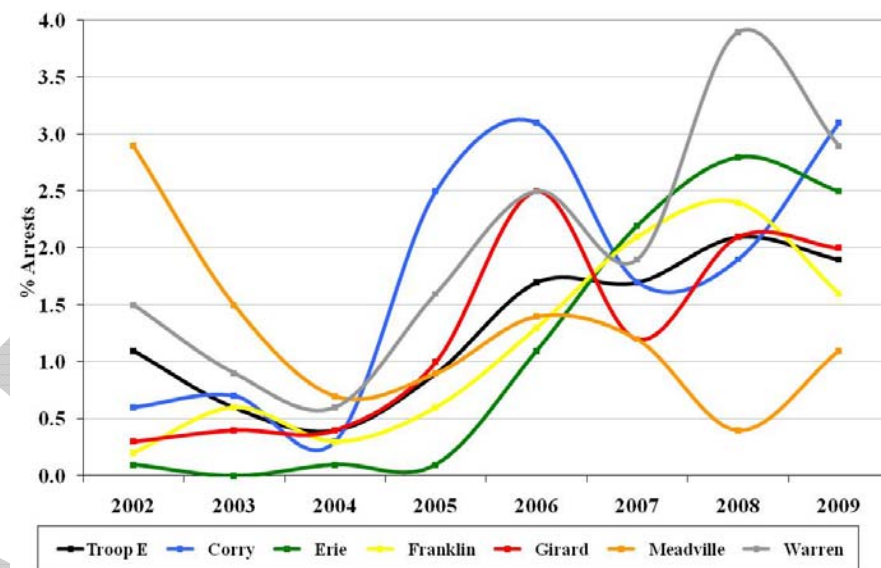**Figure 11:44: Percent of Traffic Stops Resulting in a Search – Troop H**

Figure 11:43: Percent of Traffic Stops Resulting in an Arrest – Troop H
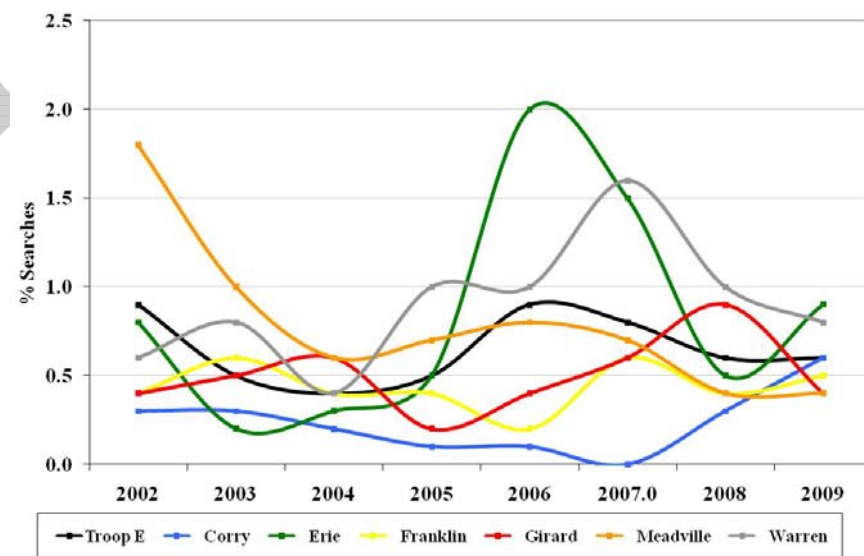

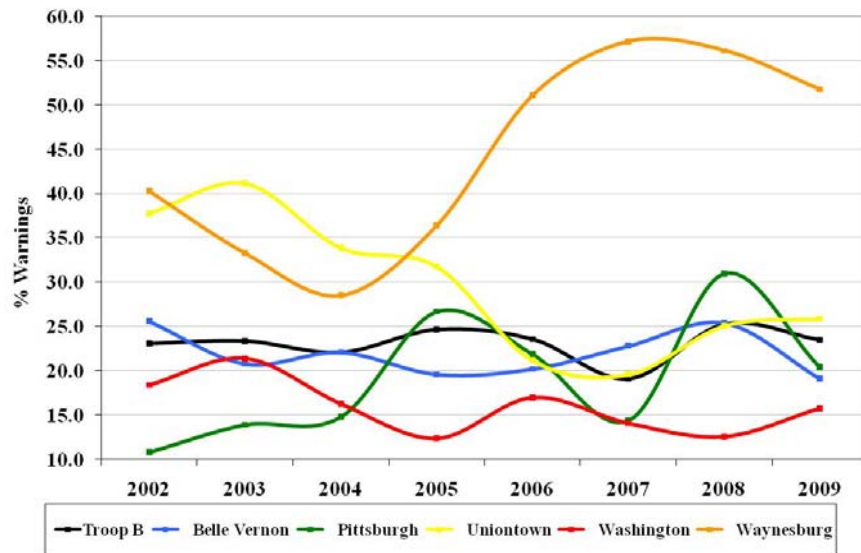**Figure 11:45: Percent of Traffic Stops Resulting in a Warning – Troop C**

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Figure 11:46: Percent of Traffic Stops Resulting in a Citation – Troop C

Figure 11:48: Percent of Traffic Stops Resulting in a Search – Troop C

Figure 11:47: Percent of Traffic Stops Resulting in an Arrest – Troop C

Figure 11:49: Percent of Traffic Stops Resulting in a Warning – Troop D

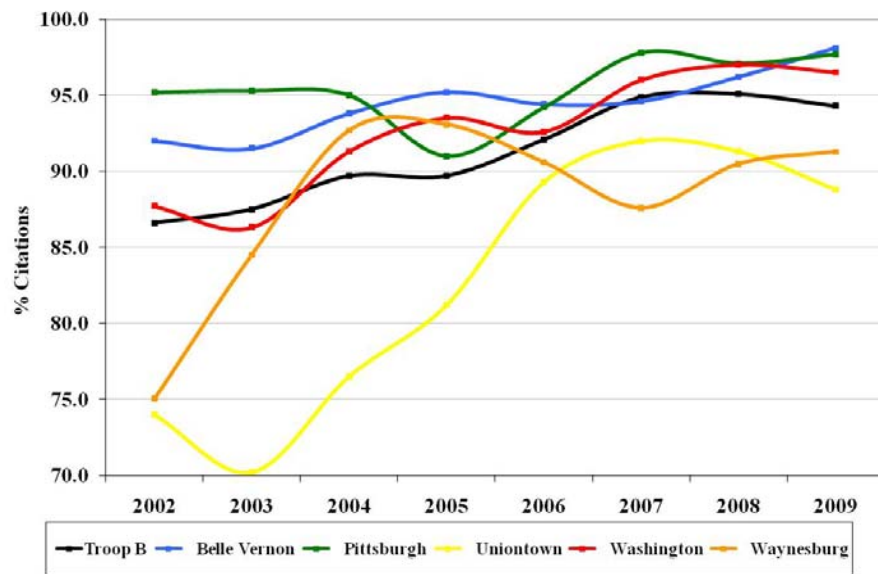**Figure 11:50: Percent of Traffic Stops Resulting in a Citation – Troop D**

Figure 11:52: Percent of Traffic Stops Resulting in a Search – Troop D

Figure 11:51: Percent of Traffic Stops Resulting in an Arrest – Troop D

Figure 11:53: Percent of Traffic Stops Resulting in a Warning – Troop E

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Figure 11:54: Percent of Traffic Stops Resulting in a Citation – Troop E

Figure 11:56: Percent of Traffic Stops Resulting in a Search – Troop E
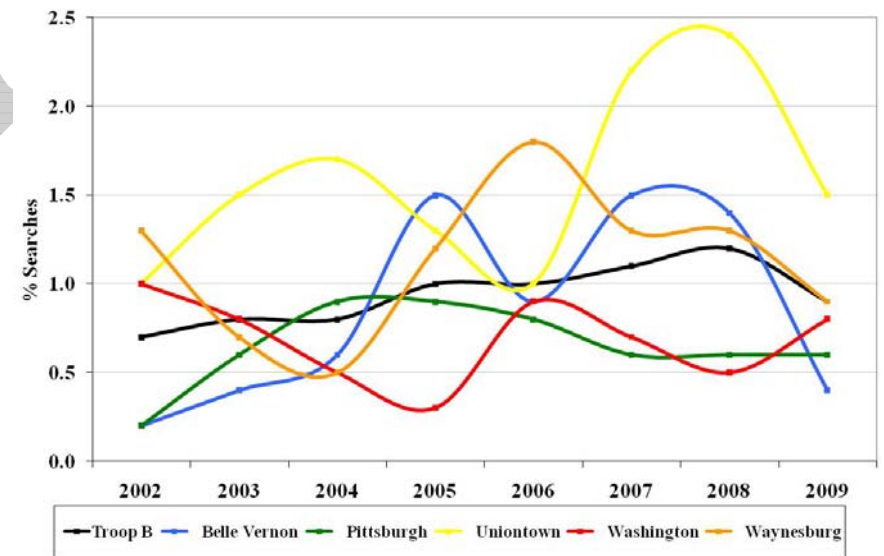

Figure 11:55: Percent of Traffic Stops Resulting in an Arrest – Troop E

Figure 11:57: Percent of Traffic Stops Resulting in a Warning – Troop B

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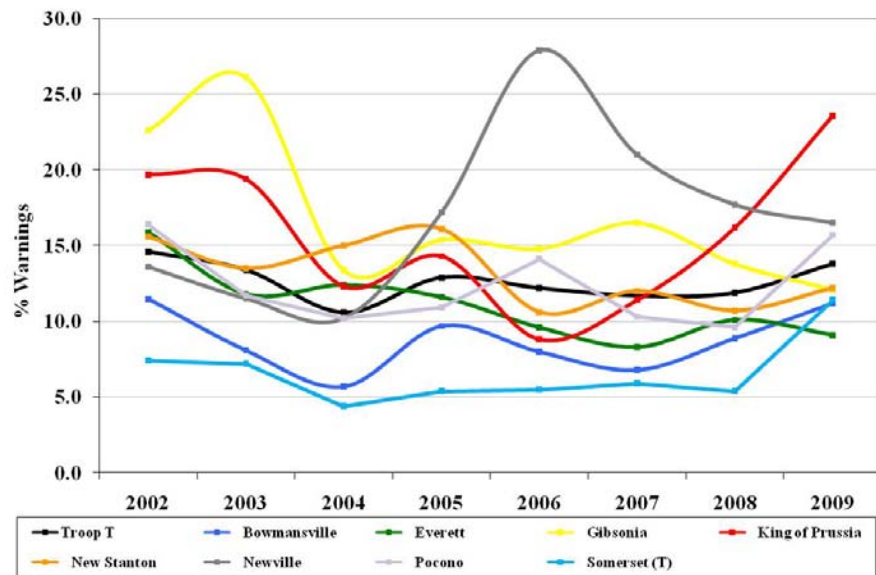**Figure 11:58: Percent of Traffic Stops Resulting in a Citation – Troop B**

Figure 11:60: Percent of Traffic Stops Resulting in a Search – Troop B

Figure 11:59: Percent of Traffic Stops Resulting in an Arrest – Troop B

Figure 11:61: Percent of Traffic Stops Resulting in a Warning – Troop T

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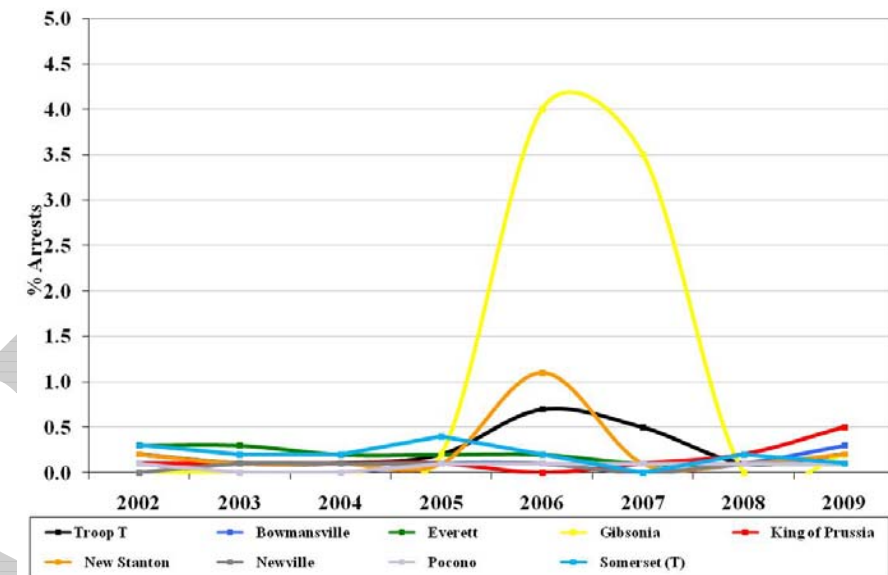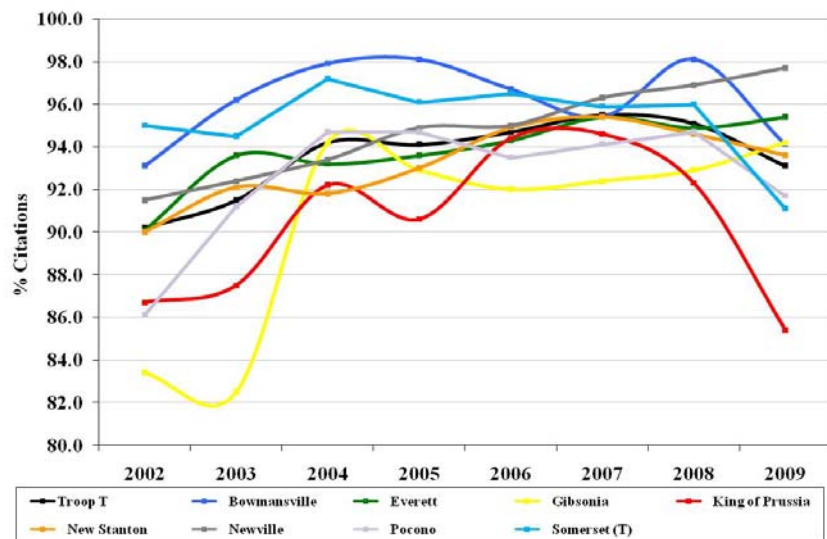**Figure 11:62: Percent of Traffic Stops Resulting in a Citation – Troop T**

Figure 11:64: Percent of Traffic Stops Resulting in a Search – Troop T

Figure 11:63: Percent of Traffic Stops Resulting in an Arrest – Troop T

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