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THE OHIO STATE UNIVERSITY

2024 Annual Report

Pennsylvania State Police Traffic Stop Study

January 1 – December 31, 2024

Robin S. Engel, PhD
Jennifer Calnon Cherkauskas, PhD

Submitted to:
Colonel Christopher L. Paris
Commissioner, Pennsylvania State Police

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Please direct all correspondence regarding this report to RA-PSPCOMM@pa.gov

ABOUT THE AUTHORS

Robin S. Engel, PhD, is Senior Research Scientist at the John Glenn College of Public Affairs at The Ohio State University, Adjunct Professor at the University of Cincinnati, and Senior Advisor for 21st Century Policing Solutions (21CP). Previous positions include Vice President for Safety and Reform at the University of Cincinnati, Director of the International Association of Chiefs of Police (IACP)'s Center for Police Research and Policy, and Senior Vice President at the National Policing Institute. Dr. Engel has spent her career generating and testing evidence-based policing practices, transforming police agencies through reform efforts, implementing violence reduction strategies, and advancing police first-line supervision. As an award-winning researcher, she has partnered with police agencies and communities across the country and internationally, serving as Principal Investigator for over one-hundred funded research projects and agency reports, and has authored dozens of top-tier academic publications. From 2002–2011, and again from 2020 - present, she served as the Principal Investigation for the Pennsylvania State Police's *Project on Police Citizen Contacts*. She has also led traffic stop and use of force studies in multiple agencies, publishing extensively on these topics and serving as an expert on invited panels, conferences, and litigation. She is currently serving as an embedded researcher in the Louisville (KY) Metro and Austin (TX) Police Departments, and as Director of the recently launched, federally funded national Consortium to Advance Police Supervision (CAPS), with over 60 participating law enforcement agencies.

Jennifer Calnon Cherkauskas, PhD, is a Research Scientist at the John Glenn College of Public Affairs at The Ohio State University, an Associate Consultant with 21st Century Policing Solutions, and a Research Consultant with the University of Cincinnati Research Institute. She received her doctorate in Crime, Law, & Justice from Pennsylvania State University after completing a dissertation examining differences in driving behavior related to traffic stop study benchmarks. She has two decades of project management experience as a former Director at the National Policing Institute and Senior Research Associate at the IACP / UC Center for Police Research and Policy. Over the last twenty years, she has served as project manager for state-wide, multi-year traffic stop research projects with the Pennsylvania State Police and the Arizona Department of Public Safety, and led or contributed to multiple large-scale research, evaluation and technical assistance projects. These projects, involving partnerships with dozens of state, local and university police agencies, include topics such as organizational change, patrol officer behavior, police training, first-line supervision, and violence reduction. She currently co-leads the national Consortium to Advance Police Supervision (CAPS).

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EXECUTIVE SUMMARY

Introduction

The 2024 Annual Report of the Pennsylvania State Police (PSP) Traffic Stop Study presents a comprehensive analysis of member-initiated traffic stops conducted between January 1 and December 31, 2024. It continues a multi-year initiative to collect, audit, and analyze traffic stop data. In 2021, the Pennsylvania State Police (PSP) revitalized its effort to collect traffic stop data This initiative builds on a voluntary traffic stop data collection system created by the PSP twenty-five years ago in partnership with the current research team, which was operational from 2001 to 2010 and served as a national model for traffic stop data collection (Engel & Cherkauskas, 2022).

The report provides a detailed breakdown of traffic stop characteristics and outcomes at the department level, as well as across PSP's four Areas, 16 Troops, and 89 Stations. PSP's voluntary data collection and analysis align with best practices, showcasing its commitment to transparency and accountability to its communities and reinforcing its dedication to evidence-based policing practices. The objectives of the traffic stop data collection and analysis are to:

(1) identify patterns and trends in traffic stops and their outcomes, specifically documenting any racial/ethnic disparities;

(2) utilize data analysis to promote effective and fair law enforcement practices that enhance public and traffic safety;

(3) foster public trust through transparent documentation of traffic stop data and findings;

(4) identify opportunities for improvement in PSP policies, training, and supervisory oversight concerning traffic stops.

Data and Statistical Analyses

PSP has developed one of the most robust and reliable traffic stop data collection systems in the nation. The Contact Data Report (CDR) system captures detailed information on stop characteristics, driver characteristics, vehicle characteristics, reasons for the stop, enforcement outcomes, and characteristics of the PSP member who initiated the stop. A two-phase audit confirmed the system's integrity, with a 99.2% match rate between CDR and Computer Aided Dispatch (CAD) records and minimal missing or invalid data across all fields (overall missing rate of 0.2%). This high-quality data infrastructure supports the credibility of the report's statistical findings.

The research team employs various statistical analyses to examine the influence of race/ethnicity and other relevant factors on PSP Troopers' stopping decisions and related outcomes after a stop is initiated (see Figure 1). Each method offers distinct strengths and

limitations, collectively providing a comprehensive examination of aggregate-level patterns and trends in traffic stops and their associated outcomes across PSP organizational units and geographic areas. However, even with the availability of high-quality data and advanced statistical techniques, *it is not possible through statistical analyses alone to ascertain whether any identified racial/ethnic disparities in traffic stops or post-stop enforcement are attributable to organizational or individual troopers' racial bias or discrimination.*

Figure 1. Traffic Stop Analysis - Statistical Techniques

Research Method / Statistical Technique	Description
Descriptive Statistics	Summarize quantitative data using counts and percentages; does not account for variations in trends.
Bivariate Analyses	Evaluate relationship between two variables; does not consider any other factors that might influence that relationship.
Benchmark Analyses	Examine differences in the representation of racial/ethnic groups in stops compared to their representation in a reference or "benchmark" population that should accurately estimate the population *at risk* of being stopped. Not used in current study due to questionable validity.[1]
Veil of Darkness	Alternative to benchmark analyses; assess the relative difference in the likelihood of drivers being stopped in daylight vs. darkness across racial/ethnic groups by using changes in natural daylight during inter-twilight period.
Multivariate Logistic Regression Models	Estimate independent effect of predictor variable while controlling for effects of other variables; allows estimation of drivers' race/ethnicity independent effect on stop outcomes while other factors are taken into account. Estimates odds ratio (chances in favor of outcome ranging from 0 to infinity, with 1 representing equal chance). Does not account for impact of unmeasured factors. Substantive interpretation: 1.0 to 1.49 = substantively small; 1.50 to 2.49 = moderate effect; and 2.5 or higher = large effect.
Predicted Probabilities	Measures likelihood of outcome happening, ranging from zero (impossible) to one (certain). Predicted probabilities for stop outcomes reflect chances of enforcement action occurring for average person/stop while all other factors are held at their average.
Outcome Test	Statistical comparison of contraband seizure rates across racial/ethnic groups; only appropriate for discretionary searches (not mandatory or consent searches). Only measures disparities; cannot measure discrimination / bias.

[1] Benchmark analysis comparisons have demonstrated questionable reliability and validity. Studies have consistently demonstrated that the use of different benchmark populations can result in dramatically different findings and conclusions (Alpert et al., 2007; Engel et al., 2005; Lange et al., 2005; Ratcliffe & Hyland, 2025; Smith et al., 2021). Unfortunately, there are no readily available, valid benchmarks that can be used to estimate drivers' risk of being stopped for traffic offenses across PSP's vast jurisdiction. Therefore, benchmark analyses are not conducted for this report.

Traffic Stop Characteristics

From January 1 to December 31, 2024, PSP Troopers submitted CDRs for **433,599 member-initiated traffic stops**.[2]

- **Timing and Location**: Most stops occurred on weekdays (70.8%) and during daylight hours (66.3%). State highways (54.8%) and interstates (33.3%) were the most common locations. The overwhelming majority of stops lasted from 1 to 15 minutes in duration.
- **Stop Reasons**: Speeding was the leading reason for stop (34.3%) with an average of 21.7 mph over the limit, followed by other moving violations (27.3%), registration issues (23.2%), and equipment violations (18.3%).
- **Driver Demographics**: The average age of stopped drivers was 39.0 years; 67.0% were male; 82.9% were Pennsylvania residents. In terms of race/ethnicity, 71.3% of drivers were perceived to be White non-Hispanic, 15.0% Black, 9.0% Hispanic (White), and less than 5% of other race or unknown race/ethnicity.
- **Context:** Considerable variations are noted across different PSP units. Some differences are anticipated, influenced by factors like geography, road conditions, jurisdiction, traffic patterns, and the demographic makeup of residents and visitors across the state.

INITIAL TRAFFIC STOP

- **Benchmark analyses –** Some traffic stop reports evaluate the percentages of stopped drivers by racial/ethnic percentages against an external benchmark meant to reflect the "expected" population of drivers within these groups. However, all readily available benchmarks (e.g., residential census population) have consistently shown significant flaws with an inability to reliably account for factors that affect drivers' likelihood of being stopped (e.g., traffic-violating behavior, location, time, frequency, driving quality, vehicle condition, traffic situations, police priorities at specific times, etc.). In short, no benchmark data can effectively measure the factors that place drivers *at risk* for a traffic stop and therefore, their use as a proxy measure for the at-risk driving population is limited (Engel & Calnon, 2004a; Fridell, 2004; Ratcliffe & Hyland, 2025; Ridgeway & MacDonald, 2010). *Due to the known systematic problems with the reliability and validity of this technique, benchmark analyses are not included in this report.*

As alternatives to benchmark analyses, the research team conducted the following:

- **Veil of Darkness (VOD) analysis**, used as an alternative to benchmarks, revealed no substantively significant racial or ethnic disparities in decision to make initial traffic stop. The VOD analysis indicated that Black and Hispanic drivers were slightly more

[2] Per PSP FR-6-18, CDRs are not to be completed for response to vehicles crashes or disabled motor vehicles, or when members are assigned to Traffic Safety Checkpoints, Motor Carrier Safety Assistance Program (MCSAP) details, or State Police Aerial Reconnaissance and Enforcement (SPARE) details.

likely to be stopped during daylight (1.2 and 1.1 times, respectively) than dark during the inter-twilight period. These estimated effect sizes are substantively small.

- **Stop Reason Bivariate Comparisons** were examined to determine whether there are differences in the reasons for traffic stops across racial/ethnic groups. Findings show no substantively significant differences across racial/ethnic groups based on the reason for the initial stop.
    - Any racial/ethnic differences observed for traffic stops made for minor, non-moving violations (e.g., registration, equipment, and inspection violations) are substantively small
    - Substantively small racial/ethnic differences observed for traffic stops involving *only minor offenses* are in the opposite direction of what would be expected if minor violations were used as pretextual stops of Black and Hispanic drivers.
    - Analyses of the average amount over the limit (mph) for speeding stops show substantively small differences across racial/ethnic groups in the opposite direction of what would be expected if less severe speeding infractions were being used to stop Black and Hispanic drivers.

Collectively, analyses of reason for the stop combined with VOD analysis show no consistent evidence of racial and ethnic disparities in initial stopping decisions by the PSP.

Traffic Stop Enforcement Outcomes

The report analyzed four primary enforcement outcomes: (1) warnings, (2) citations, (3) arrests, and (4) searches[3]. Figure 2 summarizes information about the frequency of each outcome, the strongest predictors of each outcome in a multivariate logistic regression model, and whether any substantively significant differences by driver race/ethnicity were observed (odds ratios and predicted probabilities). The statistical analyses detailed within this report demonstrate:

- **Frequency of Outcomes –** Of the drivers stopped, 57.5% received at least one warning, 56.8% received at least one citation, 3.7% were arrested, and 4.5% were searched.[4]
- **Strongest Predictors of Enforcement Outcomes Post-Stop –** Multivariate regression models examining warnings, citations, arrests, and searches consistently showed that *legal variables (e.g., reason for the stop, evidence seized, and criminal history) are the strongest predictors of enforcement outcomes.*

[3] In addition to all searches, a subset – discretionary searches – are analyzed because the outcome test analysis of seizure rates is only appropriate for discretionary searches (those based on probable cause, reasonable suspicion, or drivers' consent). They exclude searches conducted based on legal or departmental requirements (i.e., incident to arrest or inventory searches).

[4] The percentage totals exceed 100% because drivers can receive multiple enforcement outcomes in a single stop.

- **Impact of Drivers Race/Ethnicity (Warnings, Citations, and Arrests) –** Multivariate regression analyses show *no substantively significant differences across racial/ethnic groups of drivers' likelihood of being warned, cited, arrested, or searched during traffic stops* after the legal, situational, individual trooper, and other driver characteristics are considered.

Figure 2. Summary of Findings from Multivariate Analyses of Stop Outcomes

	Warnings	Citations	Arrests	Searches
Percent of Stops	**57.5%**	**56.8%**	**3.7%**	**4.5%**
Strongest Predictors	Evidence seized (-) Reason for stop Multiple reasons Civil behavior	Reason for stop Criminal History (-) Evidence seized Spec Traffic Enf Civil behavior (-)	Evidence seized Criminal history Reason for stop Multiple reasons Civil behavior (-)	Criminal history Reason for stop Multiple reasons Civil behavior (-) Passengers
Racial/Ethnic Differences (Odds Ratios)	No substantive differences between White, Black, and Hispanic drivers	No substantive differences between White, Black, and Hispanic drivers	No substantive differences between White, Black, and Hispanic drivers	No substantive differences between White, Black, and Hispanic drivers
Racial/Ethnic Differences (Predicted Probabilities)	Likelihood of *warning*: 58.9% White drivers 57.7% Black drivers 52.6% Hispanic drivers	Likelihood of *citation*: 58.0% White drivers 57.0% Black drivers 60.9% Hispanic drivers	Likelihood of *arrest*: 1.0% White drivers 1.0% Black drivers 1.1% Hispanic drivers	Likelihood of *any search*: 1.8% White drivers 2.2% Black drivers 2.0% Hispanic drivers

Contraband Seizures

In 2024, PSP Troopers made 19,522 traffic stops that resulted in searches. Of these:

- 51.5% were for only mandatory reasons – incident to arrest or vehicle inventory (n=10,052 searches)
- 48.5% were for more discretionary reasons – probable cause, reasonable suspicion, and consent (n=9,468 searches)
    - Of the 9,468 discretionary searches:
        - 31.6% were for probable cause / reasonable suspicion (n=2,993 searches)
        - 68.4% were based solely on consent (n=6,475 searches)

Seizure Rates

All Searches	*34.7%*
Mandatory Searches	*11.2%*
Discretionary Searches	*59.6%*
Prob Cause/Reas Sup	65.2%
Consent	57.0%

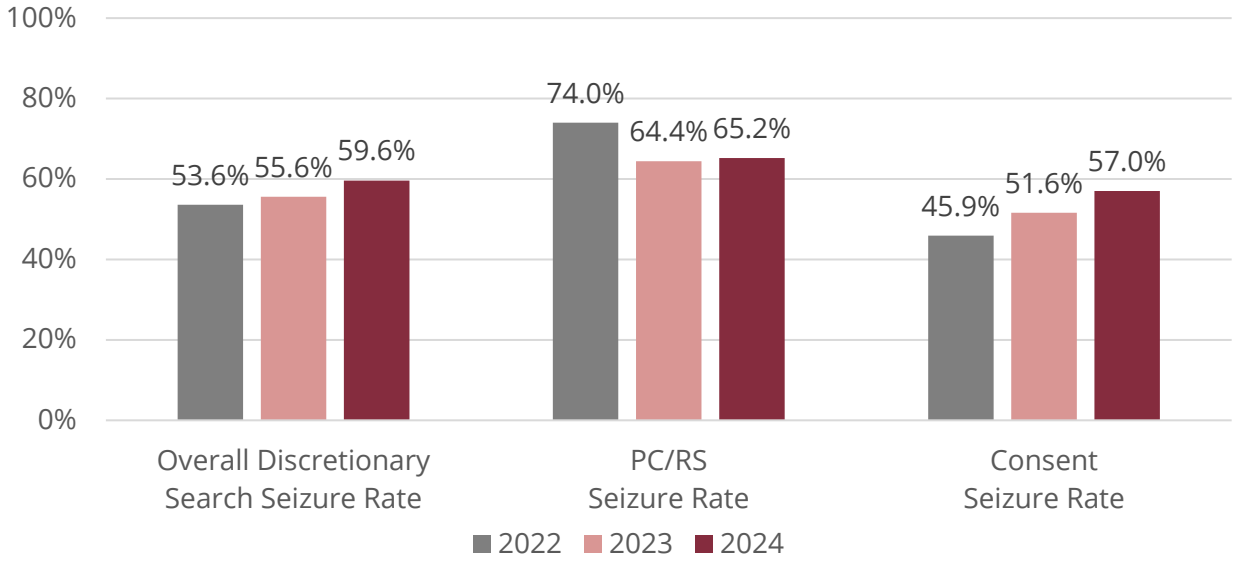
The percentage of searches that result in seizures of contraband or other evidence (seizure rates) varies by type of search.

The research team excludes searches conducted solely for mandatory reasons from the outcome test analysis of seizure rates, as it is only appropriate to conduct for discretionary searches. The majority of seizures during the 9,468 discretionary searches were of drugs (51.7%) and drug paraphernalia (30.5%).

Figure 3 displays the overall discretionary search seizure rate over time, while separating the two types of discretionary searches: (1) probable cause/reasonable suspicion (n=2,993 searches), and (2) consent without probable cause (n=6,475 searches).

- The overall *discretionary search* seizure rate has continually increased over the past three years.
- This increase in overall contraband seizure rate for discretionary searches is driven by improvements in the seizure rates of consent searches (increasing from 46% in 2022 to 57% in 2024).

Figure 3. Comparison of Discretionary Search Seizure Rates, 2022 – 2024



IMPACT OF DRIVERS RACE/ETHNICITY (SEARCHES / SEIZURES)

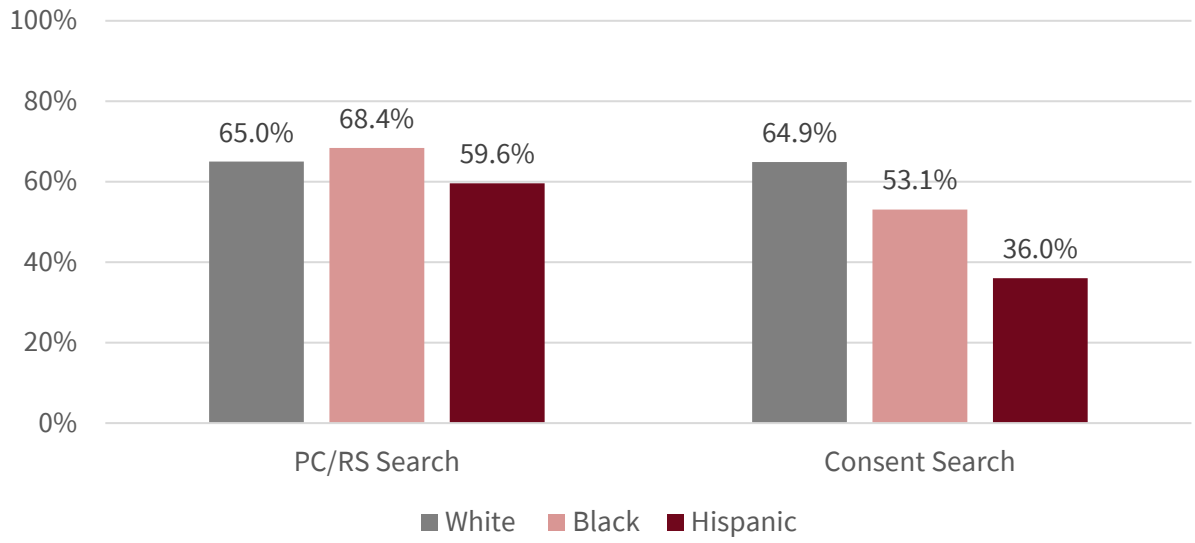
Figure 4 displays the results of the outcome test for discretionary search seizure rates by race/ethnicity.

- In 2024, for traffic stops involving probable cause/reasonable suspicion searches, Black drivers had the highest likelihood of having contraband or evidence seized (68.4%),

closely followed by White drivers (65.0%), while searched Hispanic motorists were *least* likely to have contraband seizures (59.6%). Analyses show these differences are of small substantive magnitude.

- In 2024, for traffic stops involving consent searches[5], seizure rates for Black and Hispanic motorists searched (53.1% and 36.0%, respectively) were *lower* than those for White drivers (64.9%). Additional analyses show these differences are of small substantive magnitude.

Figure 4. Discretionary Search Seizure Rates by Drivers' Race/Ethnicity



Conclusion

The PSP's continued commitment to providing professional and impartial policing services to Pennsylvania's residents and visitors is evident through their ongoing data collection, independent analyses, and public reporting of results. Key findings derived from the series of statistical analyses conducted on the 433,599 PSP member-initiated traffic stops conducted in 2024 are listed below.

(1) When assessing the **reliability and validity of data** collected during traffic stops, various analytical methods and statistical techniques show very high data quality and accuracy. The PSP has built a strong data collection system that ranks among the best

[5] Consent searches technically violate one of the underlying assumptions of the outcome test (officers have full discretion when deciding to search), since officers determine who to ask for consent to search but *the motorists decide whether to grant consent*. For example, previous analyses conducted for the PSP show differences across racial/ethnic groups for who consents to a search when asked; specifically, when asked for consent to search, Hispanic motorists were significantly more likely than White and Black drivers to give consent (Engel et al., 2008, 2011; Engel & Cherkauskas, 2011). Nevertheless, this information is provided to the PSP to give additional insights regarding consent searches.

in the country. The strength of this data collection effort increases confidence in the accuracy of the reported findings and accountability systems.ms.

(2) When evaluating the **initial decision to initiate a traffic stop**, various analytical methods and statistical techniques revealed no substantively significant differences across racial and ethnic groups. In brief, the available evidence indicates there are no concerning patterns of racial/ethnic differences in member-initiated traffic stops conducted by the PSP.

(3) When examining **enforcement outcomes from traffic stops**, a series of advanced analytical methods and statistical techniques (including binary logistic regression modeling and the calculation of predicted probabilities) showed no substantively significant differences in warnings, citations, arrests, or searches across racial/ethnic groups. Instead, legal variables were the strongest predictors of PSP enforcement actions. In summary, the evidence suggests no consistent patterns of racial/ethnic differences in the enforcement outcomes of member-initiated traffic stops conducted by the PSP.

(4) When considering **seizures of contraband or other evidence of criminal behavior** during traffic stops involving searches, the PSP demonstrated high (and continually improving) seizure rates across different types of searches. Overall, searches conducted by the PSP are highly effective, with the majority of searches conducted during member-initiated traffic stops leading to the seizure of contraband or other evidence of criminal activity.

(5) When comparing **seizure rates across different racial/ethnic groups**, only one type of search (consent) showed significant differences for one group (Hispanic drivers). While Hispanic drivers were less likely to have contraband or other evidence seized during searches based on consent, the differences across racial and ethnic groups were substantively small and have continued to decrease over time. Additional training and accountability efforts already underway by the PSP should be maintained.

Several factors likely contribute to these encouraging findings, including the PSP's increased scrutiny of traffic stops, enhanced training, a strong organizational focus on equitable treatment, improved supervisory oversight in the field, and increased accuracy of the data collected on traffic stops.

Collectively, the evidence available from this comprehensive examination of traffic stops suggests that the PSP is a national leader based on the high quality of their traffic stop data collection effort, continued reductions in racial/ethnic disparities in stops and post-stop enforcement actions, and high productivity in stops, searches, and contraband seizures. Continued data collection and independent analyses of these data will provide opportunities to track comparisons of traffic enforcement trends over time that will assist the PSP with their ongoing commitment to transparency, accountability, and continuous organizational improvement while enhancing public safety and building community trust.

1. INTRODUCTION

Analyzing traffic stops is essential for ensuring fair treatment and building community trust in law enforcement. Traffic stops represent the primary interaction between the public and police, where officers exercise considerable discretion in deciding when to stop individuals and how to enforce the law afterward (Schafer & Mastrofski, 2005; Tapp & Davis, 2022). Considering the various factors that influence police stops and enforcement choices, it is advantageous for agencies to identify patterns and trends to improve their interactions with the public in a safe and equitable manner. In 2021, the Pennsylvania State Police (PSP) revitalized its effort to collect traffic stop data (see Engel & Cherkauskas, 2022). This initiative builds on a pioneering voluntary traffic stop data collection system created by the PSP twenty-five years ago in partnership with the current research team, which was operational from 2001 to 2010 and served as a national model.[6]

The PSP's renewed collection of traffic stop data and research has several objectives, including: (1) identifying patterns and trends in traffic stops and their outcomes, specifically documenting any racial/ethnic disparities; (2) utilizing data analysis to promote effective and fair law enforcement practices that enhance public and traffic safety; (3) fostering public trust through transparent documentation of traffic stop data and findings; and (4) identifying opportunities for improvement in PSP policies, training, and supervisory oversight concerning traffic stops. The PSP's voluntary data collection and analysis align with best practices (Pryor et al., 2020), showcasing its commitment to transparency and accountability to its communities and reinforcing its dedication to evidence-based policing practices.

Shortly before the release of the *2023 Annual Report*, Pennsylvania Governor Josh Shapiro signed bipartisan legislation on June 5, 2024, to combat distracted driving and enhance roadway safety (Commonwealth of Pennsylvania, 2024). Act 18 amended the Pennsylvania vehicle code to prohibit the use of hand-held devices while operating a motor vehicle, making Pennsylvania the 29th state to implement such a ban (Ciavaglia, 2025). The law also includes traffic stop data collection and reporting provisions for state and local law enforcement officers to enhance transparency and accountability.

Both components of Act 18 have implications for PSP's ongoing traffic stop data collection. First, Act 18's ban on hand-held devices (which took effect in June 2025) may increase PSP stops aimed at its enforcement. Second, Act 18 requires PSP and local police officers to collect the specific information for "any self-initiated traffic stop:"[7]

- The reason for the traffic stop

[6] The PSP's work in the late 1990s and early 2000s collecting and analyzing traffic stop data is summarized in the 2021, 2022, and 2023 Annual Reports available here: PSP Contact Data Reporting.

[7] Act 18 defines this as "a traffic stop, regardless of the outcome, that was initiated due to reasonable suspicion or probable cause of a violation of traffic or criminal law.

- The perceived race and ethnicity of the driver subject to the traffic stop
- The gender and age of the driver subject to the traffic stop
- Whether a search was initiated, including a search of a vehicle or the vehicle operator or passengers, and, if a search was initiated, whether the search was conducted with the consent of the operator or passengers
- The results of a search
- Whether the traffic stop or subsequent search resulted in a warning, citation, arrest or other action
- Any additional information the Pennsylvania State Police deems necessary[8]

This provision takes effect December 5, 2025.

The PSP's current data collection and third-party analysis already far exceeds Act 18's reporting requirements. However, Act 18 now requires the PSP to serve as the authorized entity to receive all data collected by other law enforcement agencies covered under Act 18, and is responsible for analyzing and compiling this information into an annual report accessible to the public. Despite the lack of a standardized reporting system across Pennsylvania's local police agencies, the PSP has leveraged its extensive experience in collecting traffic stop data to lead the effort in facilitating the statewide collection required under Act 18. By incorporating essential variables for meaningful analyses (such as date, time, agency identifying number) and providing detailed response categories for other mandated data fields, the PSP has demonstrated exemplary leadership in this initiative, showcasing its commitment to both innovation and accountability in law enforcement.

About the Pennsylvania State Police

Established in 1905, the PSP is a full-service law enforcement agency (PSP, n.d.). They perform uniform patrol duties, including traffic enforcement on interstate and state highways, as well as vehicle crash and criminal investigations. Additionally, they undertake various specialized roles such as emergency response, forensics, aviation, and explosives, while providing essential law enforcement and public safety services across more than 1,200 municipalities in the state that lack their own law enforcement agencies (PATrooper.com, n.d.). Colonel Christopher Paris currently serves as the Commissioner of the PSP, overseeing approximately 4,565 sworn members.

The U.S. Census Bureau (2023) reports that the PSP serves a population of 12,961,683 residents across 46,055 square miles. The predominant racial/ethnic group in Pennsylvania is White non-Hispanics at 74.1%, followed by Blacks or African Americans at 12.3%, Hispanic or Latino residents at 8.9%, Asians at 4.2%, those of two or more races at 0.5%, American Indians and

[8] The full text of Act 18 can be accessed here: https://www.palegis.us/statutes/unconsolidated/law-information/view-statute?txtType=PDF&SessYr=2024&ActNum=0018.&SessInd=0

Alaska Natives at 0.5%, and Native Hawaiians or other Pacific Islanders at 0.1%. There is significant variation in the racial/ethnic composition of residents across the Commonwealth's 67 counties (PSDC, 2022). For instance, in Philadelphia County, Black or African Americans comprise 43.0% of the population, with 23.9% in Delaware County and 19.1% in Dauphin County. Conversely, some counties report Black or African American populations of less than 1%, such as Jefferson County (0.6%), Elk County (0.6%), and Bedford County (0.8%).

2023 Report Summary and PSP Response

Released last year, the *2023 Pennsylvania State Police Traffic Stop Study* provided findings from descriptive, bivariate, and multivariate statistical analyses of 449,047 stops conducted by PSP members from January 1 to December 31, 2023 (Engel et al., 2024). Descriptive statistics highlighted variations in stop characteristics, reasons for stops, driver demographics, and stop outcomes across different PSP organizational units. Some differences are anticipated due to variations in the geography, roadways, jurisdiction, traffic patterns, and the demographic composition of residents and travelers statewide. Multivariate analyses revealed that legal factors (such as the reason for the stop, multiple violations detected during the stop, contraband seized, and drivers' criminal history) were the strongest predictors of post-stop enforcement actions and outcomes. After statistically controlling driver, vehicle, and situational characteristics, no substantively significant racial or ethnic differences were found in whether stopped drivers received warnings and citation, or if they were arrested. However, unexplained racial and ethnic disparities persist in some search outcomes, though these disparities have diminished since 2022. While overall seizure rates (i.e., the percentage of searches that result in contraband seizures) have risen, consent searches specifically continue to show the lowest seizure rates, along with moderate levels of unexplained racial and ethnic disparities.

Informed by the 2023 traffic stop data analyses, the research team provided three broad recommendations to the PSP. The agency's response to these recommendations from last year are documented below.

Recommendation 1: *The PSP should continue to enhance the traffic stop data collection system and analyses.*

> PSP Response: The PSP has continued to evaluate enhancements to the data collection systems, including software improvements and validation rules. For example, since the last annual report was published, the Bureau of Communications and Information Services (BCIS) has made adjustments to help detect and prevent duplicate Contact Data Reports (CDRs).
>
> The PSP will also continue to investigate and implement Artificial Intelligence (AI) powered Contact Data Reporting as opportunities are identified. A few key AI implementation strategies are listed below.

- *Enhanced Pre-Fill*: As the AI revolution continues to develop, PSP may leverage intelligent technological solutions to reduce manual entry tasks (i.e., enhancing departmental efficiencies). While PSP already utilizes "pre-fill" mechanisms such as driver and vehicle information imports from its message switch and Computer Aided Dispatching (CAD) system, leveraging AI when and where available, will streamline information entry required via the CDR form. This will enhance data collection while reducing Troopers' manual input of the data.

Recommendation 2: *Consider additional opportunities for accountability and oversight for impartial treatment during traffic enforcement.*

PSP Response: The PSP currently has several robust accountability mechanisms in place, including: (1) investigation of all complaints of biased behavior, (2) required random supervisory reviews of mobile video recordings (MVR) and body worn camera (BWC) footage, (3) supervisory review of documentation related to consent searches (via audio, video, or written form), (4) annual training to related to biased-based policing, and (5) supervisory submission of all CDRs when a vehicle and/or person is searched, property is seized, or an arrest stems from a member-initiated traffic stop.

A notable recent enhancement to these oversight processes is the completion of Body-Worn Camera (BWC) Implementation and Public Data Review Expansion. The PSP acquired Axon BWCs and Mobile Video Recorders (MVRs) to further develop public trust and provide for greater levels of transparency between PSP Troopers and the public. This implementation finished ahead of schedule in April 2025, all while still providing on-site, hands-on training. With the completed deployment of BWCs, the Department recognizes the opportunity presented by BWCs to enhance monitoring of enforcement-related activities and self-initiated traffic enforcement. Bureaus within the PSP, including the Bureau of Integrity and Professional Standards, have the ability to review videos and provide recommendations to the Bureau of Training and Education and the Bureau of Communications and Information Services to provide continuous improvement of PSP services to the public. Additionally, the use of BWC will assist with reviewing various searches, to ensure our members comply with rules and regulations.

Recommendation 3: *The PSP should continue collaborating with an independent research team to review training, policies, procedures, and data collection related to traffic enforcement and searches and seizures to identify opportunities for continuous improvement.*

- PSP Response: In the past, the Department provided online training via its Learning Management System (LMS) as well as a variety of posted bulletins related to traffic stop data collection. The Department will continue to evolve its training program for all members, with the review and recommendations of the research team. Elements of such a training program already exist within the Department and are evident in the search and seizure training programs, CDR training(s), and other LMS training (e.g. Implicit Bias Training); however, the Department will continue to develop and expand upon its current training

offerings to new cadets and enlisted personnel alike. The PSP will continue to share CDR-related trainings with the research team as new training(s) are established.

The PSP's continuous data collection, analysis, and responsiveness to past recommendations from the research team show their commitment to delivering legitimate and impartial policing services to the residents and visitors of the Commonwealth of Pennsylvania.

2024 Traffic Stop Report Outline

This report documents the results from statistical analyses of data collected during all PSP member-initiated traffic stops conducted between January 1, 2024, and December 31, 2024 and documented via the Contact Data Report (CDR). These data represent the fourth year of PSP's renewed traffic stop data collection. The remainder of Section 1 provides an overview of the report, which is organized into six sections: 1) introduction, 2) description of the data collection process and key findings from the data audit, 3) overview of the 2024 traffic stop data, 4) bivariate and multivariate analyses of post-stop outcomes for 2024, 5) searches and seizures, and 6) conclusion. Each section of the report presents information at various organizational levels, reflecting PSP's patrol structure of four Areas, 16 Troops, and 89 Stations.[9] The Appendix includes analyses of the PSP's 89 stations and two specialized units (Canine and **S**afe **H**ighways **I**nitiative through **E**ffective **L**aw **E**nforcement and **D**etection - SHIELD) to make the annual report more concise. Information is disseminated across organizational units to allow PSP officials to examine the similarities and differences throughout the department in more detail.

A summary of the content included in Sections 2 - 6 is detailed below.

SECTION 2

Section 2 outlines the traffic stop data collection system along with the methods and results from a two-phase audit of the 2024 PSP traffic stop data. For effective analysis of traffic stops, the data must be reliable, valid, and free of errors to ensure accurate findings. No matter how advanced the statistical techniques used by researchers, the findings are only meaningful if they are based on valid data. Section 2 concludes with a detailed description of the research methods and the quantitative statistical analyses employed by the research team for this report.

SECTION 3

Section 3 presents descriptive statistics for PSP traffic stops conducted in 2024. The descriptive statistics illustrate the overall trends in stops, including situational characteristics, the reasons for the stops, and the drivers' characteristics (including age, gender, residency, behavior during

[9] In March 2024, the Jefferson Hills station was created and added to Troop T, bringing the total number of PSP Stations to 89.

the stop, and race/ethnicity). These descriptive analyses cannot test the different explanations for the observed trends. Due to significant methodological weaknesses in utilizing external benchmarks as a research method to analyze racial and ethnic disparities in initial stop decisions, the research team adopts alternative analytical methods, including the Veil of Darkness analysis and examining racial/ethnic differences in reasons for the stop. These alternative approaches to identify patterns and trends in troopers' initial decisions to stop vehicles are presented in Section 3.

SECTION 4

The analyses of post-stop outcomes (e.g., warnings, citations, arrests, any searches, and discretionary searches) are detailed in Section 4. First, descriptive statistics are provided, including the frequency of various stop outcomes. Second, bivariate analysis of any differences in stop outcomes by drivers' characteristics (e.g., race/ethnicity and gender) are summarized. These bivariate analyses do not account for other factors influencing the likelihood of traffic stop outcomes. To address this, Section 4 includes the findings from multivariate statistical analyses that examine whether traffic stop outcomes differ significantly across several factors, including legal variables, driver characteristics, vehicle characteristics, stop characteristics, and trooper characteristics.

SECTION 5

Section 5 examines the PSP's search and contraband seizure activities. The statistical analyses focused on "discretionary" searches – which include those conducted based on probable cause, reasonable suspicion, and consent, but exclude mandatory searches dictated by policy – are reported. In addition, a comparison of contraband seizure rates (i.e., the percentage of searches that lead to contraband seizures) across different types of searches (e.g., probable cause/reasonable suspicion searches and consent) is reported across drivers' racial and ethnic groups.

SECTION 6

Section 6 summarizes the key findings from the analyses of the 2024 traffic stop data and provides concluding statements about the PSP's current data collection system and plans for continued transparency and continuous improvements.

APPENDIX

The Appendix includes station-level tables for Sections 2 - 4 to permit PSP Area, Troop, and Station Commanders to review the findings at more granular organizational specificity.

2. DATA AND METHODS

The PSP collaborated with Drs. Engel and Cherkauskas from the research team to develop the current data collection initiative. Initially conducted from 2002 – 2010, the prior PSP traffic stop studies guided this effort, along with the latest updates and technology practices in the field. During 2021 and 2022, the PSP further refined and enhanced their renewed data collection protocol content and quality. Section 2 outlines the data collection process, along with the data fields identified for analysis. It also includes the findings from the research team's two-phase data audit. Finally, Section 2 concludes with a thorough description of the research methods and quantitative statistical analyses used by the research team leading to the results documented in Sections 3 – 5.

Data Collection

PSP Troopers are required to complete Contact Data Reports (CDR) for every member-initiated traffic stop, regardless of the outcome of that stop.[10] They input data electronically via mobile data terminals (MDTs) using a software system known as TraCS (Traffic and Criminal Software). Many fields are auto-populated from other PSP electronic forms to enhance efficiency and reduce errors. Table 2.1 below shows the information included on the CDR for 2024, along with a brief description of how each variable is measured. The PSP data collection encompasses comprehensive fields that gather details about the stop's characteristics (e.g., date, time, location), and relevant context regarding the stop and vehicle, reasons for the stop, driver characteristics, enforcement results, presence of passengers, and characteristics of the PSP member who initiated the stop. Following a recommendation from the 2022 report, the PSP introduced data fields in August 2023 to indicate whether the drivers' criminal history was queried and, if so, whether any criminal history was found. Additionally, a manual entry field was added to record the specific reason for the stop when the "Other" reason category is selected. This report marks the first complete year of data (2024) incorporating these new variables. These and other new fields added during the first three years of renewed data collection provide important context for understanding traffic stop outcomes. With revisions from 2021 to 2023, the PSP's data collection protocol significantly surpasses the minimum reporting standards typically required by state legislation or voluntarily adopted by law enforcement agencies.

The PSP's CDR form is more comprehensive than the reporting requirements enacted in Pennsylvania's Act 18 legislation in June 2024.

[10] Per PSP FR-6-18, CDRs are not to be completed for response to vehicles crashes or disabled motor vehicles, or when members are assigned to Traffic Safety Checkpoints, Motor Carrier Safety Assistance Program (MCSAP) details, or State Police Aerial Reconnaissance and Enforcement (SPARE) details.

Table 2.1. Summary of 2024 Contact Data Report Fields

Category	Data Fields Captured	Details
Stop Characteristics	Location	County & municipality code/name, latitude/longitude
	Stop time	24-hour; HH:MM
	Stop date	MM/DD/YYYY
	Roadway type	Interstate, state highway, county/local road, other
	Vehicle registration state	Format: AA, two alpha characters
	Duration of stop	In minutes: 1 – 15, 16 – 30, 31 – 60, 61+
Reason	Reason(s) for stop	Equipment/inspection, license, other moving violation, registration, speeding, other (specify in text entry)
	Speeding information	If reason for stop is speeding: posted speed limit, driver speed, MPH over limit
	Window Tint	If reason for stop is equipment: window tint Yes/No
Special Enforcement	Special enforcement team	Yes/No
	Dedicated enforcement team	Yes/No (If yes, the Trooper is prompted to select or confirm, if auto-populated, that they are assigned to a troop-dedicated enforcement team, SHIELD, or Canine unit
	MCSAP	Yes/No (Motor Carrier Safety Assistance program)
Driver	Date of birth	MM/DD/YYYY
	Gender	Female, male, unknown
	Race	White, Black, American Indian/Alaskan Native, Asian/Pacific Islander, Two or More Races, Unknown
	Ethnicity	Hispanic Origin, Not of Hispanic Origin, Unknown
	Limited English proficiency	Yes/No (If yes, the type of language assistance utilized)
	Driver behavior	Civil, disrespectful, non-compliant, verbally resistant, physically resistant (select all that apply)
	Zip code of residency	5-digit zip code, 99999 used for international
Stop Result	Warning type	None, verbal warning, written warning
	Number of warnings	Enter the number of warnings
	Number of citations	Select number of driver citations
	Driver arrested	Yes/No
	Search initiated	Yes – Roadside, Yes – Towed, searched elsewhere, No
	Searched	Select all that apply: Driver, passenger, vehicle
	Search reason	Incident to arrest, inventory, officer safety (Terry search), plain view contraband, probable cause + exigency, search warrant, consent (written, verbal)
	Property seized	None, alcohol, cash, drugs, drug paraphernalia, stolen property, vehicle, weapons, other
	Criminal history	Whether queried: Yes/No, if queried, whether detected: Yes/No
	K-9 utilized	Yes/No
Passenger	Number of passengers	Select number of passengers
	Asked passenger for ID	Yes/No
	Passenger ID type	State, federal, county/municipal, or foreign issued ID, other,
	Passenger ID justification	Safety concern, reasonable suspicion, assume driving responsibility, other
	Passenger race & ethnicity	Same as drivers' race and ethnicity response options
	Limited English proficiency	Yes/No. If yes, same as driver LEP response options
	Stop outcomes	Number of warnings, citations, or whether arrested
Employee / PSP Member Information	Location code	Assigned station
	Gender	Male/female
	Race/ethnicity	Black, Hispanic, White, American Indian/Alaskan Native, Hawaiian/Pacific Islander, Asian
	Length of service	Number of years of service
	Assignment	Job code (e.g., Patrol, Canine, Drugs)
	Rank	Trooper, Corporal, Sergeant, Lieutenant, Captain, Major

Data Audit

Data auditing plays a crucial role in evaluating data integrity before conducting statistical analyses. This systematic process assesses the reliability and validity of the collected data. **Data reliability** pertains to the stability or consistency of measured items (i.e., whether the variable is consistently measured across cases). Ensuring data reliability is essential for trusting that any observed changes in the data reflect actual conditions rather than shifts in data collection. Relatedly, **data validity** concerns the overall accuracy of these measures (i.e., whether it measures what it is intended to measure). Validating data collection measures is critical for upholding the quality of scientific research. Efforts in data collection must aim for both reliability and validity to foster confidence in any subsequent statistical analyses conducted (Loken & Gelman, 2017).

No data collection Is perfect, but minimizing measurement errors (i.e., the difference between observed and actual values) is critical, as analyses conducted using error-prone data can lead to biased conclusions. It is imperative to mitigate both systematic measurement error (i.e., consistent mistakes in data collection) and random measurement error (i.e., mistakes that arise due to chance and vary across measures). Random measure errors typically have a minor impact on conclusions, as they tend to cancel each other out; however systematic measurement errors create consistent bias across all cases (Singleton & Straits, 2005). While inaccurately collected data may not affect reliability, its validity is likely severely impacted.

This report is based on the 2024 CDR data that documents information gathered during **433,599 member-initiated traffic stops** conducted from January 1 to December 31, 2024. The following section summarizes the results from a two-phase data audit of the 2024 CDR data.

DATA AUDIT PHASE 1

Phase 1 evaluates data accuracy by comparing the number of stops recorded in electronic CDR data with that in a separate information source. This comparison assesses data validity by checking whether all stops documented externally appear in the CDR data (i.e., troopers fill out data collection reports as mandated for all member-initiated stops). An external data source is required to verify that all eligible traffic stops are logged. Common comparison sources include Computer Aided Dispatch (CAD), citation records, written warnings, video recordings, or other departmental data (Fridell, 2004; Ramirez et al., 2000). In 2004, the Police Executive Research Forum (PERF), a prominent police research and policy organization, released an extensive guide for analyzing traffic stop data that continues to serve as a key resource for law enforcement agencies 20 years later. This guide recommends aiming for at least a 90% match between data sources (Fridell, 2004).

After discussions with PSP personnel, the research team concluded that the most suitable and thorough comparison data for the CDR data would be CAD calls categorized as traffic stop

incidents by the PSP.[11] While the reporting standards for the two datasets are nearly the same, certain exclusions are applied to the CAD data to facilitate an "apples-to-apples" comparison.[12]

Results

The Phase 1 data audit evaluates the total number of traffic stops recorded in CAD calls (classified as traffic stops) against the overall traffic stops reflected in the CDR data for the entire agency and at the Station level. The percent difference indicates the proportion of traffic stops that are inconsistent between the two data sources. This difference is calculated using the following formula, where the "observed value" represents the number of stops in the CDR data (n=433,599), while the "true value" reflects the number of stops in the CAD data (n=436,888):

$$\text{Percent Difference} = \frac{V_{observed} - V_{true}}{V_{true}}$$

A positive difference indicates the percentage of stops that are present in the CDR data but absent from the CAD records. Conversely, a negative difference signifies the percentage of stops present in the CAD records but absent from the CDR data.

99.2% Accuracy Across Records

The department-level percent difference between the two datasets is -0.8%, indicating that 99.2% of records correspond across both data sources. This figure surpasses the PERF's recommended standard, which is a correspondence of 90% or higher (Fridell, 2004). It also improves upon 2023's percent difference of 3.6%. Across the department, the number of traffic stops recorded in CAD is slightly higher than in CDR. Moreover, applying the same 10% difference standard, the audit results at the station level are positive. As in 2023, none of the 89 stations (or specialized units) show a difference of 10% or more. A table summarizing the comparisons at the department and station levels can be found in the Appendix.

[11] CAD codes for non-trooper-initiated traffic stops are categorized differently (for instance, when a dispatcher gets a report of a traffic violation like an erratic driver and assigns it to a trooper for action). This distinction differentiates these incidents from those involving a trooper initiating a traffic stop, generating a call number themselves.

[12] To focus solely on trooper-initiated stops within the CAD data, 3,087 stops were excluded that related to motor carrier enforcement, along with 300 stops concerning disabled motorists, as they do not require CDR documentation. Additionally, to ensure each CAD incident is counted only once, 863 duplicate incidents were omitted. Finally, to confirm that the CAD incidents resulted in stops generating a CDR, 184 CAD incidents were excluded that related to pursuits without apprehension and 271 incidents were excluded that included canceled CAD incidents, since these did not conclude with an individual being stopped.

DATA AUDIT PHASE 2

Phase 2 of the 2024 data audit evaluates the completeness and accuracy of data gathered by PSP Troopers. This evaluation of data reliability includes identifying missing data (i.e., entries not made by the trooper) and logical discrepancies (i.e., fields with absent or incorrect data that contradict others). This audit reviews the fields against *CDR Data Dictionary* standards.[13]

0.2%
Overall Missing Data Rate

Results

Table 2.2 below displays the percentage of missing data and inconsistencies found in the 2024 CDR data. As mentioned earlier, PERF recommended in its 2004 guide that the acceptable missing data rate should be under 10%. However, due to enhancements in the quality and consistency of data collection systems, our research team suggests a stricter threshold of less than 5% error rate, aiming for 2% as the ideal target. The findings of this section of the data audit indicate that PSP's data collection processes are strong. As outlined in Table 2.2, all analyzed variables show minimal or no missing or invalid data. Overall, the data validation integrated and regularly enhanced within the TraCS system have significantly reduced error rates.

[13] The CDR Data Dictionary is PSP's internal codebook document that describes each of the data fields in the CDR data collection, defines each field's response options and type of data entry, and documents revisions or updates to the CDR program.

Table 2.2. Missing and Invalid Data From Member-Initiated Traffic Stops (n=433,599) Jan-Dec 2024

	% Missing	% Invalid
Stop Characteristics		
Date of Contact	0.00%	0.00%
Time of Contact	0.00%	0.00%
Location of Stop[14]	0.00%	0.00%
Roadway Type	<0.01%	0.00%
Duration of Stop	<0.01%	0.00%
Reason for the Stop	<0.01%	0.00%
Special Traffic Enforcement	<0.01%	0.00%
Dedicated Enforcement Team	<0.01%	<0.01%
MCSAP Related	<0.01%	0.00%
Outcome: Warning Type	0.07%	0.00%
Outcome: Number of Driver Warnings	0.00%	<0.01%
Outcome: Number of Driver Citations	<0.01%	0.00%
Outcome: Driver Arrest	<0.01%	0.00%
Outcome: Search[15]	<0.01%	<0.01%
Criminal History[16]	<0.01%	0.00%
Driver Characteristics		
Year of Birth	0.02%	0.03%[17]
Gender	0.00%	0.00%
Race	<0.01%	0.00%
Ethnicity	<0.01%	0.00%
LEP	<0.01%	0.00%
Behavior/Demeanor	<0.01%	0.00%
Zip Code	0.04%	0.76%[18]
Vehicle Characteristics		
Vehicle State of Registration	0.01%	0.00%
Number of Passengers	<0.01%	0.00%
Trooper Characteristics		
Gender	0.00%	0.00%
Race	0.00%	0.00%
Years of Service	0.00%	0.00%
Rank	0.00%	0.00%
Assigned Station Code	0.00%	0.00%

[14] A “valid location of stop" exists if 1) troopers enter county and municipality codes or they are auto-filled from the selected location in the TraCS Location Tool, or 2) latitude and longitude coordinates are auto-populated from various TraCS forms (e.g., warning, citation). Missing data appears if absent in the original forms.

[15] For search, the % missing reflects any missing data on whether a search was conducted, whereas the % invalid reflects missing data on one or more of the required data fields if search = yes (e.g., search reason, target, and contraband seized).

[16] For “criminal history,” the % missing reflects any missing data on whether criminal history was queried, while the % invalid reflects missing data on whether criminal history existed once queried.

[17] There were 129 CDRs with dates of birth before 1/1/1924 or after 1/1/2014 that are counted as invalid.

[18] 3,272 CDRs included zip codes that were not in traditional numeric format.

FURTHER EXPLORATION OF UNKNOWN DRIVERS' RACE, ETHNICITY, AND GENDER

Three additional fields present potential data integrity issues not accounted for in Phase 2 of the data audit. Fewer than ten CDRs lack information on drivers' race, ethnicity, and gender but others have these attributes classified as "unknown."[19] As noted in previous annual reports, that drivers' gender and racial/ethnic identities are purposefully assessed using officers' perceptions rather than self-identification or official information (Engel & Cherkauskas, 2022; Engel et al., 2023), which aligns with best practice guidelines (Fridell et al., 2001; Pryor et al., 2020). Although officers may misinterpret drivers' characteristics, this does not impact data collection analyses aimed at understanding officer decision-making.[20]

Following quarterly reports in 2022 that showed large variations in the percentage of drivers with "unknown" race and ethnicity, the PSP, based on recommendations from the research team, provided clarification to its members in a directive on August 12, 2022.[21] The percentages of unknown race and ethnicity declined significantly after the PSP directive was issued, with unknown race decreased from 6.0% to 3.4% of traffic stops and unknown ethnicity declining from 7.6% to 3.9%.

Figure 2.1 compares the average percentage of drivers with unknown race and ethnicity reported before and after the August 12, 2022 PSP Directive with the percentages reported in calendar year 2023 and 2024. As shown, the percentage of unknown race reported on the CDR forms in 2024 (2.6%) was relatively consistent with 2023 (2.5%) and represents a much lower percentage than reported in 2022, particularly before the PSP Directive. Similarly, the percentage of reported unknown ethnicity in 2024 remained consistent with that reported in 2023 (both 2.9% of stops).

2.6%
Unknown Driver Race

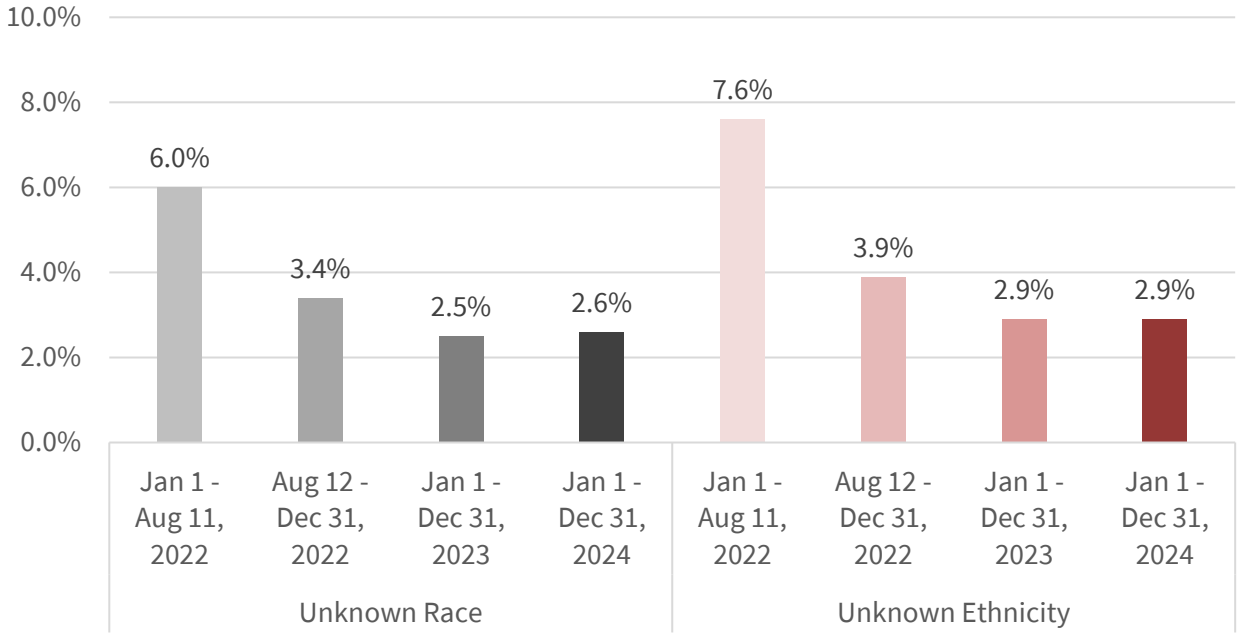
2.9%
Unknown Driver Ethnicity

[19] The percentage of CDRs with unknown gender reported in 2024 is only 0.2%.

[20] Concerns about racial, ethnic, and gender profiling arise from the belief that officers treat motorists differently due to bias. Thus, data collection must identify officers' perceptions of a driver's race or ethnicity, which may not reflect the driver's actual background. Officers' perceptions are what matter in these inquiries.

[21] The Director of the Bureau of Communication and Information Services (BCIS) released a PSP Postmaster Communication that stated "members are reminded that they shall report their perceptions of occupants' race/ethnicity." Further guidance indicated: "'Unknown' should only be used in the rare circumstance that a member is unable to perceive the race and/or ethnicity. For the purposes of the CDR form, the occupant's actual race/ethnicity is irrelevant as the information we are collecting is based on the members' perception. For the same reason, members shall not ask occupants to identify their actual race/ethnicity."

Figure 2.1. Percent Unknown Race/Ethnicity of Drivers 2022 – 2024, Department-Wide



In 76.7% of the stops where the drivers' race is unknown, their ethnicity is also recorded as unknown. Likewise, in 67.0% of stops with unrecorded ethnicity, the drivers' race remains unidentified. Other observational and traffic studies have highlighted challenges in identifying the race and ethnicity of drivers, especially in distinguishing Hispanic drivers from White drivers (Alpert et al., 2004b; Lange et al., 2001, 2005; Smith & DeFrances, 2003).

As shown in Table 1.3, at the Area level, all four Areas reported less than 3% unknown race in 2024 and less than 4% unknown ethnicity in 2024. At the Troop level, 14 of the 16 Troops have less than 5.0% unknown race (Troop B = 5.3%, Troop M = 5.1%). Additionally, the percentage of unknown drivers' ethnicity for all Troops is now below 10%, and 13 of 16 Troops reported 5.0% or lower unknown drivers' ethnicity.

Table 2.3. Percent Unknown Race/Ethnicity by Department, Area, and Troop, 2022 – 2024

	Unknown Race					Unknown Ethnicity				
	1/1/22-8/11/22	8/12/22-12/31/22	2023	2024	Diff btw 2023 & 2024	1/1/22-8/11/22	8/12/22-12/31/22	2023	2024	Diff btw 2023 & 2024
PSP Dept.	**6.0%**	**3.4%**	**2.5%**	**2.6%**	**0.1%**	**7.6%**	**3.9%**	**2.9%**	**2.9%**	**0.0%**
AREA I	**5.4%**	**2.8%**	**2.4%**	**2.9%**	**0.5%**	**6.4%**	**3.5%**	**3.2%**	**3.6%**	**0.4%**
Troop B	6.0%	4.5%	4.1%	5.3%	1.2%	9.0%	6.3%	6.7%	7.9%	1.2%
Troop C	7.2%	3.9%	2.3%	2.8%	0.5%	6.9%	3.6%	1.7%	2.3%	0.6%
Troop D	5.4%	2.1%	2.2%	2.5%	0.3%	5.7%	3.1%	3.4%	2.9%	-0.5%
Troop E	2.7%	1.0%	0.9%	1.0%	0.1%	3.6%	1.0%	0.9%	0.9%	0.0%
AREA II	**6.5%**	**4.1%**	**2.7%**	**2.0%**	**-0.7%**	**7.5%**	**4.2%**	**2.9%**	**2.2%**	**-0.7%**
Troop A	1.9%	0.8%	1.2%	0.8%	-0.4%	2.9%	0.8%	1.1%	0.8%	-0.3%
Troop G	4.5%	3.1%	2.2%	1.8%	-0.4%	4.6%	2.9%	1.9%	1.7%	-0.2%
Troop H	3.6%	1.7%	1.0%	1.2%	0.2%	3.9%	1.6%	0.9%	1.0%	0.1%
Troop T	13.0%	9.0%	5.2%	3.3%	-1.9%	15.2%	9.8%	6.1%	4.4%	-1.7%
AREA III	**8.0%**	**3.3%**	**2.8%**	**2.6%**	**-0.2%**	**10.8%**	**3.9%**	**2.9%**	**2.8%**	**-0.1%**
Troop F	3.7%	1.8%	2.3%	2.2%	-0.1%	4.3%	1.9%	2.3%	2.0%	-0.3%
Troop N	13.4%	4.1%	3.4%	3.5%	0.1%	18.0%	4.5%	3.3%	3.7%	0.4%
Troop P	2.8%	2.1%	2.7%	2.3%	-0.4%	3.1%	2.9%	3.1%	2.9%	-0.2%
Troop R	11.3%	6.0%	2.8%	2.3%	-0.5%	17.8%	8.6%	3.4%	2.9%	-0.5%
AREA IV	**4.3%**	**3.1%**	**2.1%**	**2.9%**	**0.8%**	**6.3%**	**4.0%**	**2.6%**	**3.5%**	**0.9%**
Troop J	1.7%	1.0%	0.9%	1.1%	0.2%	2.9%	1.5%	1.0%	1.1%	0.1%
Troop K	5.8%	5.3%	3.4%	4.1%	0.7%	9.1%	6.9%	4.1%	5.9%	1.8%
Troop L	3.7%	2.4%	1.6%	2.4%	0.8%	5.1%	3.1%	2.3%	2.6%	0.3%
Troop M	6.6%	4.2%	3.0%	5.1%	2.1%	8.7%	5.1%	3.8%	5.6%	1.8%

A table displaying the average percentages of unknown race and ethnicity across PSP stations is included in the Appendix. Overall, 76 of the 89 stations reported less than 5% unknown race and 74 stations reported less than 5% unknown ethnicity. Two stations should be further examined by PSP officials with over 10% of stops with reported unknown driver race and/or ethnicity: **Belle Verno**n (11.0% race, 11.2% ethnicity), **Pittsburgh** (11.6% race—up from 4.7% in 2023, and 22.9% ethnicity—up from 16.0% in 2023). Notably, two other stations that exceeded 10% in 2023 (Everett and Somerset-T) have now reported less than 6% unknown race and ethnicity in 2024.

Methodology and Statistical Analyses

There is long-standing and on-going debate among academics regarding the best methods to examine racial/ethnic disparities in criminal justice outcomes, particularly for traffic stops where the population "at risk" of being stopped is unknown (Engel & Swartz, 2014; Mears et al., 2016; Sampson & Lauritsen, 1997). While understanding the decisions made by troopers during initial stops is crucial for both PSP executives and the public, the traffic stop data collected falls short of capturing all the factors that affect this decision-making process. Previous research has sought to compare the proportion of drivers stopped based on race or ethnicity with various benchmark estimates of the "expected" racial/ethnic makeup of drivers. However, this line of inquiry has inherent limitations. Unfortunately, the widely available external benchmark that has been used is residential population data, which is significantly flawed and not valid for these types of analysis. Residential population data not accurately reflect the likelihood of drivers being stopped. The risk of being stopped by police while driving a motor vehicle is shaped by factors such as driving location, time, frequency, vehicle type, driving behavior, and potentially, demographic attributes (Alpert et al., 2004a; Engel & Calnon, 2004a; Fridell, 2004; Ridgeway & MacDonald, 2010). In short, where you drive, when you drive, how often you drive, how you drive, what you drive, who you are, how you act, and who is riding with you can all potentially impact your chances of being stopped by police while driving and the resulting outcomes of that stop. There are no current alternative sources of data (i.e., benchmark data) that reliably measure all of these risk factors.

Comprehensive assessments must use diverse methodological and statistical techniques that acknowledge the strengths and limitations of each approach. Other recent statewide studies have used multiple approaches to measure disparities (Wolfe et al., 2021; Ross & Barone, 2024). This report includes descriptive statistics, bivariate analyses, Veil of Darkness analyses, multivariate logistic regression analyses, predicted probabilities, and the outcome test.

DESCRIPTIVE STATISTICS

Descriptive statistics, such as frequencies, provide a summary of quantitative data using counts and percentages. Their primary function is to outline and clarify the characteristics of numerical data (for instance, the overall patterns in traffic stops), though they do not account for variations in these trends (Witte & Witte, 2015). Such differences are often anticipated due to factors like geography, road conditions, jurisdiction, traffic patterns, and the demographic composition of both residents and travelers throughout the state. Descriptive statistics are used in Section 3 to describe traffic stops and drivers, while in Section 4, they detail stop outcomes, and in Section 5, they describe searches and seizures.

BIVARIATE ANALYSES

Bivariate analyses evaluate the relationship between two variables, offering an initial insight into their relationship between a set of variables. However, this approach does not consider

any other factors that might influence that relationship. Bivariate analyses in this report are largely based on the Chi-square statistical test, which determines if the associations between two variables significantly differ from expected values. Statistical significance refers to the confidence level that the observed differences are not a result of random chance or sampling error, represented by a p-value. In social sciences, a 95% confidence level is commonly used, suggesting that the findings are 5% or less likely to result from chance or sampling error (Betensky, 2019). This represents the degree of confidence associated with the relationship or the extent to which the relationship is not due to randomness.

Additionally, the results of these statistical tests are impacted by sample size, meaning even substantively small differences can appear statistically significant in larger samples. To evaluate the substantive significance or strength of statistically significant results, we utilize Cramer's V measure of association, which ranges from zero (indicating no association) to one (indicating perfect association). According to general guidelines, Cramer's V values between 0.07 and 0.20 suggest small effects, values from 0.21 to 0.34 indicate medium effects, and values of 0.35 or higher represent large effects (Cohen, 1988; Sheskin, 2011). In Section 3, bivariate analyses are employed to explore racial/ethnic differences in stop reasons; in Section 4, to investigate the relationship between drivers' race/ethnicity and post-stop outcomes; and in Section 5, to assess the association between drivers' race/ethnicity and seizure rates during discretionary searches.

EXAMINING DISPARITIES IN TRAFFIC STOPS

Benchmarks

The estimated "at risk" benchmark population that is selected drives the results. Studies have consistently demonstrated that the use of different benchmark populations can result in dramatically different findings (Alpert et al., 2007; Engel et al., 2005; Lange et al., 2005; Ratcliffe & Hyland, 2025; Smith et al., 2021).

Given the limitations associated with benchmark analyses, when the PSP began collecting traffic stop data in 2002, they also contracted with the research team to independently observe how the motoring public used roadways and their speeding behavior at sampled locations throughout the Commonwealth. This observational research examining an alternative benchmark revealed that it was incorrect to assume the residential population resembled both the driving population and those committing speeding infractions, particularly in counties with high levels of interstate travel. Additionally, while significant racial and ethnic disparities were noted between stops and Census benchmarks, these disparities were considerably reduced or, in some instances, completely eliminated when stops were compared to benchmarks that more accurately reflect roadway usage and driving behavior (Engel et al., 2005).

Some studies have proposed using not-at-fault accident data as an alternative estimate of the driving population (Alpert et al., 2004a; Lovrich et al., 2007; Withrow & Williams, 2015). Benchmarks derived from vehicle collision data offer a more valid and reliable estimate of the driving population by accounting for driving frequency and exposure to police enforcement.

Because the analyses are limited to accidents involving not-at-fault drivers, it is assumed that this represents a random sample of drivers on the roadway in specific areas. Unfortunately, in Pennsylvania, collision reports do not capture the race or ethnicity of drivers involved in accidents; this is necessary information to compare the race and ethnicity of stopped drivers.

Due to the inherent methodological limitations present in all benchmark analyses, such as the absence of reliable and valid comparison data, these analyses are not included in this traffic stop study (Engel & Calnon, 2004a; Tillyer et al., 2010).[22] Instead, this report uses three alternative methods to understand how drivers' race/ethnicity affects the initial decision to initiate a traffic stop.

Descriptive Statistics by PSP Organizational Units

First, it presents descriptive statistics derived from the information on the CDR across various PSP organizational units (Area, Troop, and Station). This approach allows PSP leaders to identify variations in patterns and explore potential explanations for these differences. However, this represents only the initial step in unraveling the complexities of racial/ethnic disparities; it is essential but not adequate. After the collection of 2025 data, there will be enough continuously collected valid traffic stop data (2022 – 2025) to conduct time series analyses, which will facilitate an analysis of trends over time and provide a more informative foundation for exploring any changes in racial/ethnic disparities.

Veil of Darkness

Second, this study employs the Veil of Darkness (VOD) technique, introduced by Grogger & Ridgeway (2006), as an alternative to benchmark analysis. The VOD statistical method analyzes a subset of traffic stops that take place during the "inter-twilight period," where natural variations in daylight occur throughout the year. This allows the assessment of relative differences in the ratio of minority to non-minority stops in daylight versus darkness. The VOD approach does not assert that identifying drivers' characteristics at night is impossible or that it is always feasible during the day; instead, it posits that recognizing driver characteristics is generally more challenging in the dark (Grogger & Ridgeway, 2006; Knode et al., 2024). The VOD's main strength lies in utilizing a natural experiment based on seasonal variations in daylight hours to determine if officers are more inclined to stop Black drivers during daylight hours compared to nighttime. However, the main limitation is its focus on a small subset of traffic stops, predominantly occurring during a single PSP shift. This analysis, however, is now consistently used for traffic stop studies of large agencies in California, Connecticut, Michigan, New Jersey, and Rhode Island like the PSP that have enough stops conducted during the inter-

[22] This decision is consistent with our research team's previous work with the PSP. After the first two years of stop data were compared to residential population statistics, observations of roadway usage, and speeding behavior, the research team reported our determination in the 2004-2005 Report that it was not a valid approach to continue (Engel et al., 2007). The remaining annual reports through 2010 focused on stop trends and enforcement outcomes over time.

twilight period" to produce reliable results (Knode et al., 2024; RIPA Board, 2021, 2022, 2023; Ross & Barone, 2024; Wolfe et al., 2021).

Stop Reason Bivariate Comparisons

Third, numerous jurisdictions across the country have implemented new statutory or policy measures regarding officers' traffic enforcement, stemming from the belief that certain low-level, non-moving violations are disproportionately used against drivers of color for "pretextual" reasons (Boehme & Mourtgos, 2024; Fliss et al., 2020; Holder, 2023). While we cannot determine with these data whether stops conducted by the PSP for violations related to equipment, registration, and inspection are conducted for pretextual purposes (which is lawful under Whren v. U.S., 1996), we explore if racial and ethnic disparities exist across the various reason for the stops. A key limitation of this analytical approach is its reliance on bivariate comparisons, which, as mentioned earlier, fail to consider other factors that may influence this relationship. Nevertheless, an initial observation of significant bivariate disparities in stops for minor offenses across racial and ethnic groups may suggest a need for further examination of these differences.

PREDICTING STOP OUTCOMES

One significant benefit of analyzing post-stop enforcement outcomes is that, unlike the initial stop decision, where the pool of eligible drivers is uncertain and can only be poorly estimated, the group for post-stop outcomes is clearly defined (i.e., all drivers who were stopped are known). Consequently, more robust statistical and methodological approaches can be utilized to investigate any racial or ethnic disparities in enforcement actions that happen after the initial stop is made. The following analyses seek to answer the question: What factors influence the likelihood of receiving a warning, citation, arrest, or search?

Multivariate Regression Models

Several factors can affect troopers' decision-making during a traffic stop. For instance, characteristics of the driver, the vehicle, the stop itself, the reasons for the stop, other legal considerations, and the officer's characteristics have all been shown in previous studies to impact post-stop enforcement results (Engel & Calnon, 2004b; Schafer et al., 2006; Tillyer et al., 2019; Tillyer & Engel, 2013). Multivariate analyses assess the independent effects of these variables while controlling for the predictive power of the others. This method allows for the estimation of race/ethnicity's independent effects on stop outcomes (such as warnings, citations, arrests, and searches) once all other predictor variables are taken into account. The occurrence or non-occurrence of specific enforcement outcomes during a stop results in a binary outcome, which indicates that the outcome of interest is dichotomous. Logistic regression is the appropriate statistical modeling technique for this binary outcome, defined as (0 = does not occur, 1 = does occur) (Hanushek & Jackson, 1977; Liao, 1994; Meyers et al., 2016).

When interpreting multivariate logistic regression models, there are three key components to consider.[23] First, these models reveal the relative strength of relationships between the independent variables and the dependent variable through two related metrics for each independent variable: (1) the coefficient, indicating the predicted log-odds, and (2) the odds ratio. The coefficient provides an additive measure of a specific variable's influence. A negative coefficient signifies a negative relationship, suggesting that the variable's impact makes the enforcement outcome less likely. Conversely, a positive coefficient (no sign) implies that the variable increases the likelihood of the enforcement outcome. In logistic regressions, results are conveyed as “odds ratios," which illustrate the relationship between two events.[24] Odds ratios exceeding 1.0 indicate a positive correlation, while those below 1.0 signify a negative correlation. The formula (1/(Exp(B))) is used to convert an odds ratio below 1.0 into a positive value. Odds ratios indicate how the likelihood of the enforcement outcome changes due to a specific variable. It is crucial to assess the influence of a variable, illustrated by the size of the odds ratio, which reflects the strength of its relationship with the dependent variable. Generally, odds ratios from 1.0 to 1.5 may be considered substantively small, 1.6 to 2.5 represent a moderate effect, and 2.6 or higher suggest a large effect (Chen et al., 2010).

Second, significant findings imply statistical significance, indicating a confidence level that the observed differences are not due to random chance or sampling error. While differences might be noted across coefficients, they may not reach statistical significance. This means we cannot be confident that the difference is not attributable to random chance. Each variable in the model has a defined significance threshold reflected by a p-value. As noted above, a traditional confidence level of 95% is generally utilized, meaning the result is 5% or less likely to result from random chance or sampling error (Betensky, 2019). However, in large samples, significance testing can be more sensitive to very small or artifactual relationships between variables, thus detecting statistically significant differences that lack substantive or practical meaning (Allison, 1999). For this reason, we have raised the significance threshold to 0.1% in our analyses involving large sample sizes, which equates to an observed relationship being attributable to chance only once in 1,000 instances (Lin et al., 2013).

In sum, due to the large sample size, even if the relationship between variables is statistically significant, it might not be practically significant (Benjamin & Berger, 2019; Goodman, 2008; Greenland et al., 2016; Wasserstein & Lazar, 2016). Thus, when assessing the impact of specific factors on post-stop enforcement outcomes, we prioritize the size of the regression coefficients

[23] This description and summary of multivariate logistic regression modeling is derived from various sources (see Hanushek & Jackson, 1977; Liao, 1994; Long, 1997; Meyers et al., 2016; Witte & Witte, 2015).

[24] Technically, this odds ratio represents a type of log-odds; however, interpreting this value can be non-intuitive. For this reason, it is common to exponentiate the coefficient for clearer interpretation in terms of odds (Liao, 1994). The odds ratio reflects this transformation by converting the coefficient into the multiplicative odds of the outcome variable relative to the predictor variable, assuming all other factors remain constant.

and the odds ratios (which reflect the strength of the relationship) over mere statistical significance.[25]

Third, while multivariate statistical modeling is a more comprehensive analytical strategy than bivariate analysis, a significant limitation of multivariate statistical analysis is that it can only control statistically for the variables that are measured. This limitation is known as "model specification error," which refers to the error in a statistical model due to the inability to account for all factors influencing the outcome (Hanushek & Jackson, 1977; Jung et al., 2018; Marvell & Moody, 1996). In traffic stop data collection systems, it is not feasible to gather every relevant factor that might explain stop outcomes. Therefore, although researchers may have greater confidence in multivariate results, the findings should be interpreted with this inherent limitation in mind.

The Nagelkerke R-square statistic for each model is presented in the outcome-specific tables. This measure, relevant to binary logistic regression, offers a general view of model goodness-of-fit. In the social sciences, a common guideline indicates that a model with an R-square less than .10 is considered poorly fitting, one between 0.10 and 0.20 is viewed as a weak-to-solid fitting model, and those above 0.20 are regarded as robust fitting models (Muijs, 2012). Model fit assesses whether the factors together serve as strong predictors of the outcomes; specifically, whether the factors measured using the CDR data collection forms effectively predict the occurrence of warnings, citations, arrests, or searches during traffic stops. However, the accuracy of model specifications is essential for all goodness-of-fit statistics. For instance, if certain variables are excluded (such as related factors that remain unmeasured or not included in the analyses), the goodness-of-fit will have limitations due to full model specification error. While we are confident in comparing our estimates (identifying which specific factors within each model are most strongly associated with post-stop outcomes), we also recognize that many unmeasured variables could influence the likelihood of warnings, citations, arrests, and discretionary searches during traffic stops. This consideration is a typical assumption in quantitative regression analyses (Hanushek & Jackson, 1977).

Predicted Probabilities

Additional findings are included to enhance understanding of how drivers' race/ethnicity may affect post-stop outcomes. Each regression analysis result determines if there is a correlation between drivers' race/ethnicity and the likelihood of specific enforcement outcomes. The

[25] It is important to note that standard multivariate analyses are grounded in one level of data and reflect a one-to-one ratio between variables at that level. That is, variables in most data are independent of each other. However, the PSP stop data do not align with this guideline, as stops occur both within and across 89 PSP stations and throughout 67 counties in the Commonwealth. As a result, the shared attributes of events within these organizational or geographical contexts are not independent (Raudenbush & Bryk, 2002). The research team performed sensitivity tests regarding variations at the PSP station and county levels to predict PSP stop outcomes. Ultimately, more than 90% of the outcome variation can be accounted for using level-1 predictors (i.e., stops). Therefore, for the sake of simplicity and efficiency, we limit the analyses discussed in this section to the individual level (i.e., logistic regressions). The complete Hierarchical Generalized Linear Models (HGLM) are available from the authors upon request.

"odds" represent the likelihood of a specific outcome occurring, with values ranging from zero to infinity, where "1" indicates equal chances. In contrast, probability measures how likely an outcome is to happen, ranging from zero (impossible) to one (certain). We use predicted probabilities to more accurately assess the true influence of race and ethnicity on stop outcomes. Following Liao (1994:12), we transform the logistic regression coefficients from our models into predicted probabilities. The **predicted probabilities** for stop outcomes reflect the chance of an event occurring for an average person/stop while considering all variables in the models. This method offers a more accurate risk assessment than the general outcome percentage, given the models' accuracy and predictive capabilities.

Calculating the probabilities for White, Black, and Hispanic drivers based on various stop-related situational and legal factors allows for a comparison of estimates among different racial and ethnic groups regarding their *probability* of warning, citation, arrest, or search, assuming all else is equal (i.e., all other measures in the models are set to their mean) values.[26]

PREDICTING CONTRABAND SEIZURES

Identifying contraband during searches of individuals and vehicles is a key outcome when exploring possible racial or ethnic disparities. Commonly known as search "success rates" or "hit rates" (i.e., the percentage of searches that yield contraband), some researchers apply the "outcome test" to identify these disparities by analyzing differences in search success rates (Knowles et al., 2001; Ayres, 2001). Racial and ethnic comparisons of seizure rates are determined by calculating the percentage of searches where officers seize contraband (e.g., drugs, illegal weapons, etc.) against the total number of searches conducted (Fridell, 2004; Ramirez et al., 2000). It has been suggested by some researchers that if drivers are searched solely based on legitimate legal factors and suspicions not related to race, similar percentages of searches resulting in seizures should be expected across various racial groups (Knowles et al., 2001; Ayres, 2001).

The application of the outcome test to police searches is based on the premise that if officers profile drivers due to racial bias, they will persist in searching Black and Hispanic drivers even when the likelihood of finding contraband is lower compared to searches of White drivers (Anwar & Fang, 2006). Conversely, in the absence of bias, a state of equilibrium will eventually be achieved, whereby police searches among racial groups are proportional to their actual possession of contraband. The reliance on the principle of equilibrium eliminates the need for incorporating multiple variables (i.e., a multivariate model).

[26] Predicted probabilities are a prediction of an outcome; the ability to predict accurately is based on a full and complete regression model. A model with omitted variable bias (i.e., factors that are important but go unmeasured/unaccounted for) will not fully and accurately predict an outcome. There are rare cases where the outcome can occur more than the probabilities of the outcome. It is important to remember these predictions are average predictions (i.e., on average, when a trait is present, an outcome occurs). In rare events, however, the actual outcome may take place more than the predictions of the outcome due to the potential for extreme clustering of events in a short period of time.

Like other analytical methods, the outcome test has limitations regarding its conclusions (Engel, 2008; Engel & Tillyer, 2008). A central assumption of the outcome test is that officers possess complete discretion over conducting searches. Based on this criterion, the outcome test is suitable solely for examining traffic stops that lead to a probable cause or reasonable suspicion search. Mandatory searches should be excluded because officers are required to conduct them under specific conditions. Consent searches are more complex. Although officers initially decide from whom to request consent to search, it is ultimately the motorists who decide whether the consent searches take place (Fridell, 2004; Engel, 2008). Motorists have the right to refuse search requests, and if an officer lacks probable cause, they must respect the denial. Additionally, prior PSP reports clearly demonstrate that consent search approval rates vary across racial and ethnic groups (Engel et al., 2008, 2011; Engel & Cherkauskas, 2011). Other limitations of the outcome test involve the flawed assumptions that officers do not consider motorists' behaviors when deciding on searches, that their search decisions are uniform, and that the sole purpose of a search is to uncover contraband (see Engel, 2008).

Despite the limitations of the outcome test, it offers an alternative method to assess post-stop enforcement outcomes. To help the PSP better understand consent searches and their effectiveness, analyses examining racial and ethnic differences in consent seizure rates are provided along with the seizure rates for reasonable suspicion and probable cause searches, with the strong caveat that this information should be used solely for internal comparisons and training. Therefore, while we employ the outcome test methodology, we are more cautious in interpreting the findings related to consent searches. No definitive conclusions about racial bias should be drawn from these comparisons (for details, see Engel, 2008; Engel & Tillyer, 2008). ***Any racial or ethnic disparities in seizure rates identified using this method cannot determine if the differences are based on trooper bias.***

LIMITATIONS OF DATA ANALYSES

In conclusion, it is essential to interpret the statistical findings in this report with appropriate caution based on the limitations of the specific statistical method employed. ***Analyses of traffic stop data cannot determine whether PSP Troopers have engaged in discriminatory or biased policing practices, either individually or collectively.*** Moreover, these data do not allow for an evaluation of the legality of specific traffic stops. Even the most thorough data collection and rigorous statistical analysis cannot serve these purposes. These limitations of traffic stop data collection and analyses are well-recognized among scholars, however often not appropriately shared with or understood by the public (Engel & Calnon, 2004a; Fridell, 2004; Pryor et al., 2020; Tillyer et al., 2010).

Collecting and analyzing data related to traffic stops allows PSP administrators to evaluate patterns and trends both across the agency and within its various units. Understanding these patterns and trends can facilitate improvements in training, policy, practice, and supervision. This process supports the agency's commitment to continual improvement by enabling

regular assessments of internal operations and enhancing the understanding of the factors that affect troopers' decisions during traffic stops.

Section Summary

Between January 1, 2024, and December 31, 2024, PSP Troopers collected information on 433,599 member-initiated traffic stops. The collected data includes legal reasons for each stop, as well as details about the stop, vehicle, driver, passenger, and trooper. From its initial development to ongoing updates from 2021 to 2023, the PSP data collection incorporates several fields that offer crucial explanatory context for these traffic stops.

The Phase I data audit assessed accuracy by comparing the number of stops recorded in the electronic CDR and CAD systems. Overall, 99.2% of the records matched between the two sources, surpassing the PERF-recommended correspondence rate of 90% or higher (Fridell, 2004). All 89 stations met the preferred standard of a 10% variance in either dataset.

The Phase II data audit evaluated the missing data and logical inconsistencies within the electronic records for all traffic stops. All variables used in the analyses have either no or very little missing or invalid data. This measure is well within the recommended standard of 2% or less set by the research team. Overall, the data validation checks and the auto-population of data fields built into TraCS have reduced errors related to missing and invalid data. Finally, the 2024 reported percentages of unknown race (2.6%) and unknown ethnicity (2.9%) are consistent with 2023.

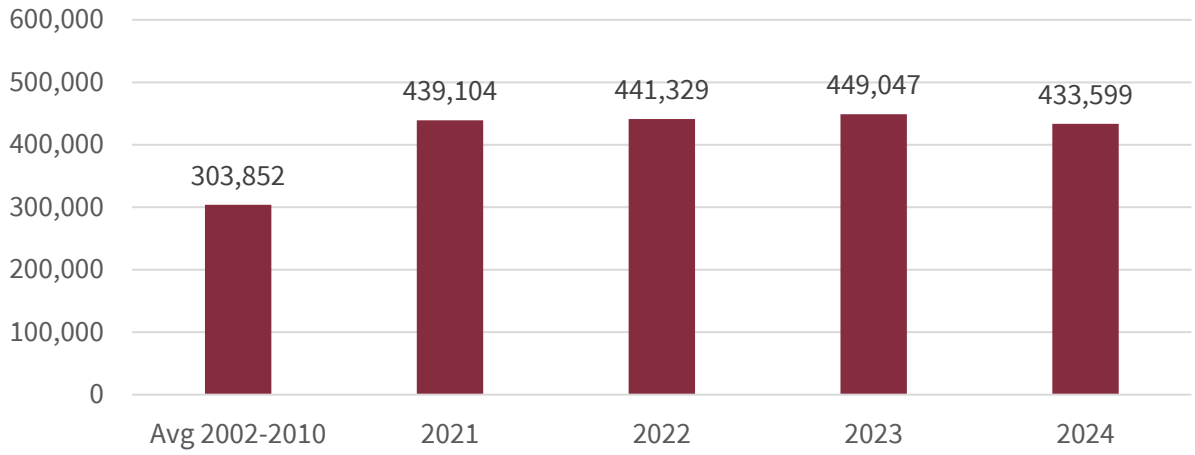
This audit indicates that the PSP has one of the nation's most extensive and high-quality processes for collecting traffic stop data.

The research team employs various statistical analyses to examine the influence of race/ethnicity on PSP stops and their outcomes. These methods include descriptive statistics, bivariate analyses, the Veil of Darkness technique, multivariate analyses, predicted probabilities, and the outcome test for seizures during searches. Each method offers distinct strengths and limitations, collectively providing a comprehensive evaluation that enhances the reliability of the findings. However, with the available data and statistical methods, it is not possible to ascertain whether any identified racial/ethnic disparities in traffic stops or post-stop enforcement are attributable to individual trooper behavior or organizational racial bias or discrimination.

3. DESCRIPTION OF TRAFFIC STOP DATA

From Jan 1 to Dec 31, 2024, PSP Troopers made 433,599 member-initiated traffic stops. As shown in Figure 3.1, the number of stops in 2024 slightly decreased (-3.4%) from 2023. Table 3.1 presents the total number of traffic stops across all organizational units. There is significant variation in traffic stop activity among PSP Areas and Troops. For instance, Area II registers the highest number of traffic stops with a total of 140,660 stops, while Area III reported the fewest stops (n=80,809). Within Area II, Troop H and Troop T report the highest traffic stop figures at the Troop level. In contrast, within Area III, Troop P and Troop R demonstrate the lowest traffic stop numbers.

Figure 3.1. Traffic Stop Volume Over Time



Traffic Stop Characteristics

Monthly Fluctuation Factors

- Weather conditions
- Seasonal tourism
- Holidays
- Road construction
- School-related traffic

Table 3.1 also presents the monthly distribution of traffic stops across all PSP organizational units. At the departmental level, the month of May exhibits the highest percentage of stops (11.8%), followed by March (10.3%), July (10.2%), and November (10.1%). This pattern is generally observed across lower organizational levels; however, Table 3.1 highlights variations in the percentage of stops recorded each month. Various factors contribute to monthly fluctuations in traffic patterns and officer activity, such as weather conditions, seasonal tourism, holidays, road construction, and school-related traffic. Therefore, variation in the number of traffic stops across time and organizational units is to be expected.

Table 3.1 Monthly Breakdown of Traffic Stops by Department, Area, & Troop, Jan – Dec 2024

	Total #	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
PSP Dept.	433,599	6.1%	7.8%	10.3%	7.5%	11.8%	7.3%	10.2%	8.4%	7.8%	6.1%	10.1%	6.6%
AREA I	100,938	5.5%	8.1%	10.2%	6.8%	11.9%	7.0%	10.8%	8.7%	7.9%	5.6%	11.2%	6.4%
Troop B	26,975	4.6%	7.4%	10.0%	6.8%	12.9%	6.8%	11.9%	7.5%	8.4%	5.7%	11.3%	6.6%
Troop C	27,575	5.3%	7.4%	9.1%	7.0%	12.1%	6.2%	11.0%	10.1%	8.5%	5.8%	11.9%	5.4%
Troop D	20,571	6.3%	8.9%	11.0%	6.6%	11.7%	8.3%	10.0%	8.3%	7.9%	4.7%	10.7%	5.7%
Troop E	25,817	6.0%	8.8%	11.0%	6.5%	10.7%	6.8%	10.0%	8.9%	6.8%	6.0%	10.7%	7.7%
AREA II	140,660	6.8%	7.8%	9.8%	8.1%	12.2%	7.3%	9.7%	8.0%	7.7%	6.3%	9.7%	6.6%
Troop A	17,641	5.7%	7.4%	13.3%	7.1%	12.5%	6.4%	10.1%	8.0%	6.7%	4.5%	11.4%	7.0%
Troop G	26,452	6.1%	7.1%	11.3%	7.2%	15.8%	6.2%	12.1%	7.9%	6.6%	4.1%	10.8%	4.8%
Troop H	49,910	7.6%	7.7%	8.6%	7.2%	11.7%	7.6%	9.0%	7.9%	8.1%	6.1%	9.8%	8.8%
Troop T	46,657	6.7%	8.4%	9.0%	9.8%	10.6%	8.0%	9.0%	8.1%	8.3%	8.5%	8.4%	5.3%
AREA III	80,809	5.4%	6.9%	10.9%	7.1%	13.2%	8.2%	10.7%	9.0%	7.5%	5.2%	10.2%	5.8%
Troop F	32,452	5.5%	7.4%	10.8%	7.9%	15.1%	7.9%	10.3%	8.1%	6.8%	4.8%	9.7%	5.7%
Troop N	25,130	5.8%	6.1%	12.1%	6.8%	12.6%	6.4%	9.5%	8.3%	7.3%	6.8%	11.6%	6.7%
Troop P	12,455	4.3%	6.2%	9.6%	6.3%	11.4%	10.9%	13.5%	10.1%	9.2%	3.8%	9.8%	4.9%
Troop R	10,772	5.2%	8.3%	9.8%	6.5%	11.0%	10.3%	11.4%	11.9%	7.8%	4.3%	8.6%	4.9%
AREA IV	105,481	6.3%	8.1%	10.7%	7.8%	10.3%	6.6%	9.9%	8.4%	8.0%	6.8%	9.7%	7.5%
Troop J	37,865	6.5%	8.9%	9.5%	8.2%	10.1%	6.4%	9.7%	7.9%	8.3%	7.6%	8.4%	8.4%
Troop K	24,265	6.3%	8.9%	10.9%	8.3%	9.1%	6.9%	10.3%	9.0%	7.2%	6.1%	10.7%	6.3%
Troop L	21,007	6.2%	6.4%	12.2%	7.5%	12.8%	6.2%	10.3%	7.8%	6.4%	6.0%	11.3%	6.9%
Troop M	22,344	5.9%	7.6%	10.9%	6.8%	9.3%	7.3%	9.4%	9.2%	9.6%	6.8%	9.4%	7.9%

Table 3.2 shows the average percentage of stops on weekdays, during the day, and on different roadway types at PSP Department, Area, and Troop levels. It also includes the percentage of Pennsylvania-registered vehicles, presence of passengers, and stop duration.

As shown in Table 3.2, most traffic stops across the department occur on weekdays (70.8%) and during daylight hours (66.3%).[27] State highways (54.8%) and interstates (33.3%) are the primary locations for these stops. Additionally, 81.6% of the stopped vehicles are registered in Pennsylvania, and 16.0% have at least one passenger. The majority of traffic stops (91.3%) last 15 minutes or less.

Traffic stop characteristics differ by PSP Area and Troop. For instance, Area IV has a lower percentage of traffic stops during the day (56.3% of stops) compared to other areas. At the Troop level, 82.3% of traffic stops made by Troop T occur during daylight, while Troop J has only 51.9% of traffic stops during that time.

There are notable differences in the types of roadways where stops occur. For instance, 84.5% of stops conducted by Troop T take place on interstates, which aligns with their primary jurisdiction on the Pennsylvania Turnpike. In contrast, other troops, such as Troop A, show a significantly lower percentage of stops on interstates due to fewer miles of interstate roadways in their areas. The percentage of stops involving vehicles registered in Pennsylvania, stops with passengers, and average stop duration exhibit less variation based on location, with only a few exceptions. For example, Troop C, Troop T, Troop N, and Troop R stop fewer than 80% of drivers with in-state vehicle registrations.

[27] The creation of day and night variables from the time of stop data field are roughly adjusted by month to align with the shift in sunrise and sunset throughout the year.

Table 3.2. Traffic Stop Descriptives by Department, Area, & Troop, Jan - Dec 2024

	Total #of Stops	Weekday	Daytime	Roadway Type				PA Regist. Vehicle	Vehicles w/ Passengers	Duration of Stop (minutes)			
				Inter	State	Local	Other			1-15	16-30	31-60	61+
PSP Dept.	433,599	70.8%	66.3%	33.3%	54.8%	11.3%	0.6%	81.6%	16.0%	91.3%	6.4%	1.6%	0.8%
AREA I	100,938	68.4%	66.5%	25.2%	59.4%	15.0%	0.3%	85.6%	15.4%	92.8%	5.4%	1.1%	0.8%
Troop B	26,975	71.7%	68.4%	34.5%	45.6%	19.5%	0.3%	90.5%	16.1%	93.1%	5.5%	0.8%	0.6%
Troop C	27,575	65.6%	67.2%	19.9%	72.9%	7.1%	0.1%	78.2%	17.3%	93.9%	4.3%	1.0%	0.8%
Troop D	20,571	68.6%	70.4%	21.3%	65.1%	13.3%	0.4%	89.6%	13.5%	91.0%	6.0%	1.7%	1.3%
Troop E	25,817	67.7%	60.6%	24.4%	55.0%	20.3%	0.3%	85.0%	14.1%	92.7%	6.0%	0.8%	0.5%
AREA II	140,660	72.3%	70.0%	42.1%	48.3%	8.3%	1.2%	79.3%	17.8%	91.6%	6.5%	1.4%	0.5%
Troop A	17,641	71.9%	75.2%	1.4%	86.0%	12.5%	0.2%	92.8%	14.5%	92.3%	5.5%	1.2%	1.0%
Troop G	26,452	69.7%	73.4%	23.3%	70.1%	6.4%	0.3%	84.1%	14.9%	94.9%	4.3%	0.4%	0.4%
Troop H	49,910	70.9%	54.8%	26.9%	58.0%	14.9%	0.2%	80.3%	15.4%	89.2%	7.6%	2.5%	0.7%
Troop T	46,657	75.4%	82.3%	84.5%	11.3%	0.9%	3.3%	70.3%	23.1%	92.1%	6.9%	0.8%	0.3%
AREA III	80,809	69.2%	71.1%	27.0%	61.3%	11.4%	0.3%	81.1%	16.4%	91.7%	5.7%	1.7%	1.0%
Troop F	32,452	66.3%	67.4%	19.3%	71.4%	9.1%	0.1%	81.0%	18.0%	94.3%	3.9%	1.1%	0.7%
Troop N	25,130	68.7%	68.0%	38.7%	45.5%	15.4%	0.4%	79.0%	16.7%	90.0%	6.3%	2.2%	1.5%
Troop P	12,455	73.7%	80.0%	10.1%	77.9%	11.6%	0.3%	89.5%	10.6%	92.1%	5.9%	1.2%	0.8%
Troop R	10,772	73.9%	78.8%	42.5%	48.5%	8.8%	0.2%	77.0%	17.5%	87.3%	9.1%	2.8%	0.9%
AREA IV	105,481	71.0%	56.3%	30.9%	56.5%	12.0%	0.5%	83.7%	13.4%	89.7%	7.4%	1.9%	1.0%
Troop J	37,865	72.4%	51.9%	18.9%	69.7%	10.8%	0.6%	83.5%	13.0%	89.6%	6.7%	2.4%	1.3%
Troop K	24,265	71.8%	54.1%	62.2%	27.7%	9.9%	0.2%	80.7%	12.6%	89.6%	7.4%	1.8%	1.1%
Troop L	21,007	70.9%	69.5%	22.0%	61.6%	16.3%	0.1%	87.2%	15.0%	92.0%	6.6%	1.1%	0.4%
Troop M	22,344	67.8%	53.8%	25.8%	60.9%	12.5%	0.9%	84.1%	13.4%	87.8%	9.1%	1.9%	1.2%

Reason for the Stop

Figure 3.2 and Table 3.3 highlight the reasons for traffic stops, which include: speeding (along with the average mph over the limit), other moving violations, equipment violations, registration, license, and other. According to the PSP data collection protocol, troopers are instructed to select all relevant reasons; consequently, 8.0% of stops involved multiple reasons for the stop (i.e., total percentages across categories exceed 100%).

Figure 3.2 displays the reasons for stops at the department level. As shown, speeding is the most frequent reason for a stop (34.3%). The next most common reasons are other moving violations (27.3%), registration violations (23.2%), and equipment violations/inspection (18.3%).

Figure 3.2. Department-Wide Reason for Stop, Jan - Dec 2024

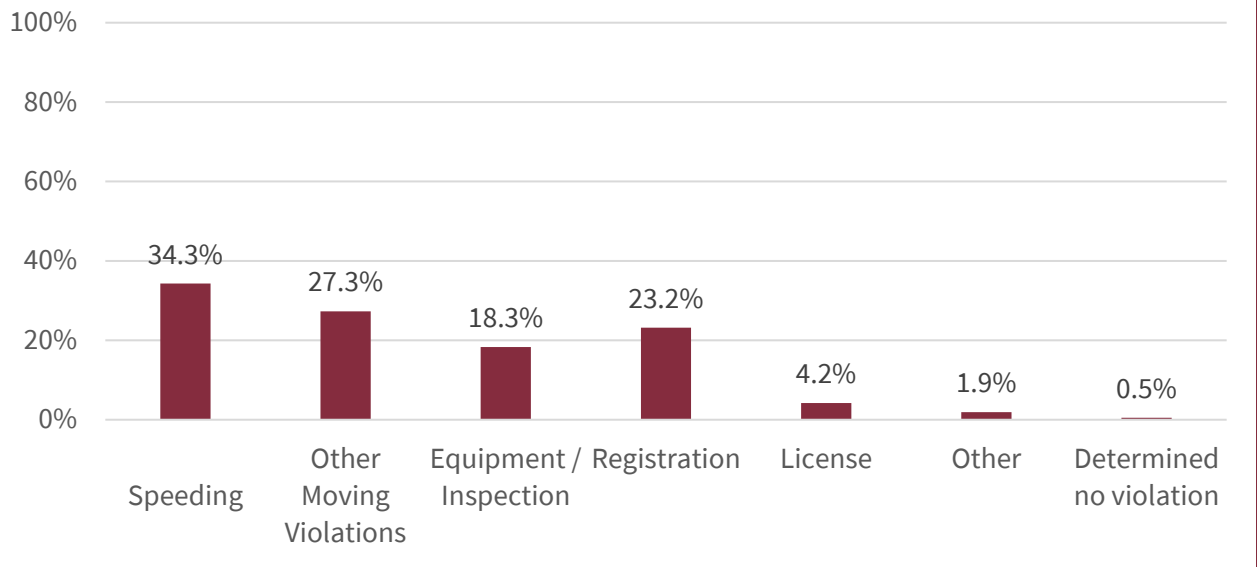


Table 3.3 indicates that speeding is the leading reason for stops in most Areas and Troops, with the exceptions of Area IV and Troops H, J, K, and M, where the most common reason is other moving violations and Troop B, where the most common reason is registration violations. The percentage of stops due to speeding varies by Area, with a high of 42.8% in Area II and a low of 24.6% in Area IV. Among the Troops, the percentage of traffic stops for speeding ranges significantly, with Troop T at 62.7% and Troop K at 15.4%.

At the departmental level, the average speed over the posted limit for speeding stops is recorded at 21.7 miles per hour (mph). Speed variations range from a low of 20.1 mph in Area I to a high of 24.4 mph in Area IV. Additionally, among the Troops, Troop C registers an average of 18.1 mph over the limit, while Troop M records an average of 28.2 mph.

34.3%
Stops for Speeding

21.7 mph
Avg Speed Over the Limit

Other moving violations are the second most common reason for stops across the department, making up 27.3% of total stops. The percentage of these stops varies by Area, ranging from 39.5% in Area IV to 21.6% in Area I. Notably, other moving violations are the leading reason for stops in Troop J (39.7%), Troop K (49.7%), and Troop M (42.8%), all in Area IV, as well as Troop H (33.4%). The range of stops for other moving violations varies from 49.7% in Troop K to 15.1% in Troop T. For further details on the reasons for stops across Areas and Troops, please see Table 3.3.

Table 3.3. Reason for Stop by Department, Area, & Troop, Jan – Dec 2024

	Total # of Stops	Speeding	Avg. Amt. Over Limit (MPH)	Other Moving Violation	Equipment/ Inspection	Regist-ration	License	Other
PSP Dept.	433,599	34.3%	21.7	27.3%	18.3%	23.2%	4.2%	1.9%
AREA I	100,938	31.4%	20.1	21.6%	24.5%	23.4%	4.4%	1.9%
Troop B	26,975	21.6%	22.5	24.9%	25.0%	32.3%	5.5%	2.0%
Troop C	27,575	42.6%	18.1	16.8%	25.2%	15.7%	2.9%	1.9%
Troop D	20,571	29.4%	23.2	24.9%	19.4%	27.5%	5.1%	2.0%
Troop E	25,817	31.2%	19.1	20.8%	27.5%	19.2%	4.4%	1.7%
AREA II	140,660	42.8%	21.8	22.6%	14.6%	24.8%	3.1%	1.9%
Troop A	17,641	37.5%	23.1	17.6%	15.2%	32.5%	3.5%	1.4%
Troop G	26,452	44.7%	21.3	18.6%	12.8%	26.0%	2.6%	1.2%
Troop H	49,910	25.2%	20.5	33.4%	19.8%	23.4%	3.6%	2.0%
Troop T	46,657	62.7%	22.2	15.1%	9.9%	22.7%	2.6%	2.4%
AREA III	80,809	37.3%	20.9	25.1%	18.3%	21.0%	4.3%	1.6%
Troop F	32,452	41.0%	19.5	22.7%	16.6%	21.7%	2.9%	1.0%
Troop N	25,130	36.9%	22.2	30.1%	15.9%	18.5%	4.6%	2.4%
Troop P	12,455	28.8%	21.7	22.3%	22.8%	25.6%	6.4%	1.6%
Troop R	10,772	36.6%	21.7	24.1%	23.9%	19.4%	5.2%	1.6%
AREA IV	105,481	24.6%	24.4	39.5%	16.2%	23.2%	5.5%	2.0%
Troop J	37,865	21.3%	23.1	39.7%	19.3%	23.1%	4.9%	1.9%
Troop K	24,265	15.4%	26.6	49.7%	10.1%	29.8%	4.5%	2.2%
Troop L	21,007	41.2%	22.2	23.6%	18.0%	18.3%	6.3%	1.7%
Troop M	22,344	24.6%	28.2	42.8%	15.6%	20.8%	6.9%	2.0%

Driver Characteristics

Two tables illustrate the characteristics of drivers stopped by PSP Troopers in 2024 at the Department, Area, and Troop levels. Table 3.4 outlines driver age, gender, behavior during the stop, and residency. Table 3.5 provides race and ethnicity information of stopped drivers.

DRIVER AGE & GENDER

According to Table 3.4, the average age of drivers stopped by troopers across the department is 39.0 years, which is similar to the averages at the Area and Troop levels. At the department level, 67.0% of stopped drivers are male; similarly, males are more frequently stopped than females across different organizational units within the department.

DRIVER BEHAVIOR

Table 3.4 presents details about driver behavior during traffic stops, highlighting whether drivers are civil, disrespectful, non-compliant, verbally resistant, or physically resistant towards troopers. PSP Troopers are instructed to mark all applicable behaviors, acknowledging that drivers' conduct may vary throughout the encounter. Thus, there are a few instances where drivers are recorded as both civil and belonging to another category (n = 637, 0.1%).[28] At the department level, 98.4% of drivers are classified as only civil, whereas 0.8% are disrespectful. Non-compliant drivers (0.3%) or those who exhibit verbal or physical resistance (0.8%) are rare. These trends are consistent across both the Area and Troop levels.

DRIVER RESIDENCY

Table 3.4 provides information regarding driver residency status based on their driver's license zip codes. Overall, 82.9% of drivers stopped by troopers in 2024 are state residents. The percentages are similar across the four Areas, though some differences are evident. For instance, 86.9% of drivers stopped in Area I are in-state residents, compared to 80.6% in Area II. As illustrated in Table 3.4, the variation is greater at the Troop level, with a high of 94.0% in Troop A and a low of 71.8% in Troop T, the Pennsylvania Turnpike station.

[28] This table displays the percentage of stops marked as "civil", where this is the only behavior classification selected by the trooper. If a trooper categorized a stop as "civil" along with at least one additional behavior, those stops are included in the percentages of the other categories. As a result, the total of these percentages exceeds 100%, as a small fraction of drivers (0.4%) demonstrated behaviors fitting into multiple categories.

Table 3.4. Characteristics of Drivers Stopped by Department, Area & Troop, Jan - Dec 2024

		Age	Gender	Behavior				Residency
	Total # of Stops	Average (years)	Male	Civil	Dis-respectful	Non-compliant	Verbal or Phys Resistant	In-State
PSP Dept.	433,599	39.0	67.0%	98.4%	0.8%	0.3%	0.8%	82.9%
AREA I	100,938	39.9	65.1%	98.5%	0.8%	0.3%	0.7%	86.9%
Troop B	26,975	39.8	64.1%	98.0%	1.0%	0.4%	1.0%	91.3%
Troop C	27,575	40.9	68.1%	98.8%	0.7%	0.3%	0.5%	79.2%
Troop D	20,571	39.0	63.7%	98.6%	0.7%	0.3%	0.6%	91.3%
Troop E	25,817	39.8	63.8%	98.6%	0.6%	0.3%	0.7%	87.0%
AREA II	140,660	38.9	66.8%	98.5%	0.8%	0.3%	0.7%	80.6%
Troop A	17,641	39.7	63.3%	98.8%	0.7%	0.3%	0.5%	94.0%
Troop G	26,452	39.3	64.4%	98.8%	0.6%	0.2%	0.6%	85.3%
Troop H	49,910	38.5	67.2%	98.0%	1.2%	0.5%	0.9%	81.7%
Troop T	46,657	38.7	69.0%	98.9%	0.5%	0.2%	0.7%	71.8%
AREA III	80,809	39.4	67.0%	98.6%	0.8%	0.3%	0.6%	81.9%
Troop F	32,452	39.7	65.5%	99.2%	0.4%	0.1%	0.3%	82.0%
Troop N	25,130	38.3	68.8%	98.1%	1.0%	0.4%	0.8%	79.6%
Troop P	12,455	40.0	67.1%	98.5%	0.8%	0.3%	0.8%	90.5%
Troop R	10,772	40.0	67.0%	98.1%	1.2%	0.4%	0.8%	76.9%
AREA IV	105,481	37.9	68.5%	98.1%	0.9%	0.5%	1.1%	85.4%
Troop J	37,865	38.1	67.5%	98.2%	0.9%	0.4%	1.1%	85.0%
Troop K	24,265	37.7	70.3%	97.9%	1.1%	0.6%	1.0%	84.0%
Troop L	21,007	38.4	67.0%	98.4%	0.8%	0.3%	0.9%	88.1%
Troop M	22,344	37.4	69.8%	97.7%	0.9%	0.7%	1.4%	85.1%

DRIVERS' RACE & ETHNICITY

Drivers' race and ethnicity are recorded in separate fields on the CDR form based on officers' perceptions, rather than asking drivers to self-identify. This method of identifying drivers' characteristics aligns with best practice guides for traffic stop data collection (Fridell et al., 2001; Pryor et al., 2020; Ramirez et al., 2000). The available response options are:

- *Race*: White, Black, American Indian/Alaskan Native, Asian/Pacific Islander, Two or More Races, and Unknown
- *Ethnicity*: Hispanic Origin, Not of Hispanic Origin, and Unknown

For analytical purposes, the research team combines the race and ethnicity data fields by coding individuals who are perceived to be White (race) or Unknown (race) and Hispanic (ethnicity) as Hispanic. Of the 42,396 individuals considered to be of Hispanic ethnicity, a significant majority are perceived by officers to be of White race (90.0%); they are coded as Hispanic. The 8.2% of individuals perceived to be Hispanic and another race (e.g., Black, Asian) are coded as their race. Drivers whose race and ethnicity were both unknown are included in a combined unknown race/ethnicity category.

Figure 3.3 below illustrates the perceived race/ethnicity of drivers stopped across the department. The majority of stopped drivers (71.3%) are perceived as White (not Hispanic), with 15.0% identified as Black, 9.0% Hispanic (White), 2.0% as Asian, 0.4% as American Indian or Alaskan Native, and less than 0.1% as two or more races.29

Figure 3.3. Department-Wide Racial/Ethnic Characteristics of Drivers Stopped, Jan - Dec 2024

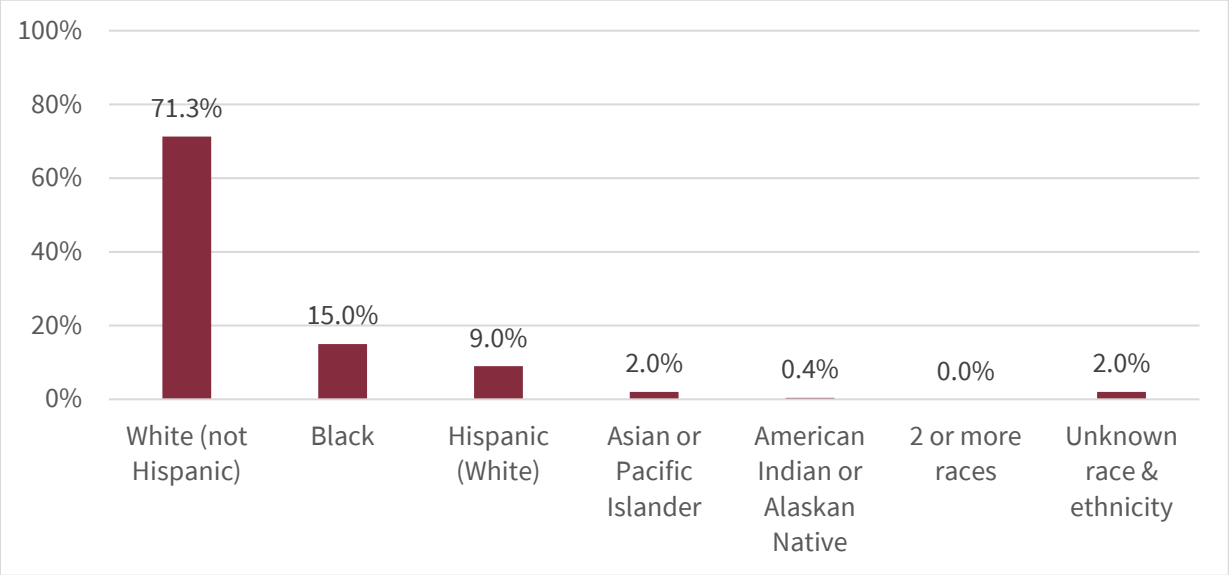


Table 3.5 illustrates the perceived race and ethnicity of drivers stopped by the Department, Areas, and Troops. **These tables demonstrate large variations in the race/ethnicity of drivers stopped across organizational units. Some variation is anticipated due to geographic, demographic, and roadway type differences throughout the Commonwealth.** For example, Troop K in the Philadelphia area indicates that 44.2% of its stops involve Black drivers, whereas Troops in more rural regions or areas with fewer interstate highways report that less than 10% of their stops involve Black drivers. Similar trends are seen with Hispanic drivers. As indicated in Figure 3.3 and Table 3.5, PSP Troopers noted that they are unable to determine both the race and ethnicity of drivers in 2.0% of traffic stops.

[29] Although the percentage of individuals identifying as two or more races in the U.S. Census has grown rapidly, PSP members might find it more difficult to accurately assess this racial identity during a traffic stop (Chavez, 2021).

Table 3.5. Race and Ethnicity of Drivers Stopped by Department, Area & Troop, Jan - Dec 2024

	Total # of Stops	White	White (not Hispanic)	Black	Hispanic (any race)	Hispanic (White)	Asian/ Pacific Islander	Amer. Ind./ Alaska Nat.	2 or more Races	Un-known race/ ethnicity
PSP Dept.	433,599	**80.1%**	**71.3%**	**15.0%**	**9.8%**	**9.0%**	**2.0%**	**0.4%**	**<0.1%**	**2.0%**
AREA I	100,938	**85.3%**	**83.1%**	**10.2%**	**2.6%**	**2.3%**	**1.4%**	**0.2%**	**<0.1%**	**2.3%**
Troop B	26,975	78.6%	76.8%	14.8%	2.3%	1.9%	1.2%	0.2%	<0.1%	5.1%
Troop C	27,575	90.9%	88.6%	4.4%	2.8%	2.5%	1.5%	0.3%	<0.1%	2.6%
Troop D	20,571	83.7%	82.0%	12.8%	2.0%	1.8%	0.9%	0.1%	0.0%	2.4%
Troop E	25,817	87.4%	84.7%	9.5%	3.2%	2.9%	1.8%	0.3%	<0.1%	0.8%
AREA II	140,660	**81.6%**	**75.5%**	**13.5%**	**7.2%**	**6.4%**	**2.3%**	**0.5%**	**<0.1%**	**1.4%**
Troop A	17,641	90.9%	89.5%	7.4%	1.7%	1.5%	0.7%	0.2%	<0.1%	0.7%
Troop G	26,452	88.7%	85.7%	7.1%	3.3%	3.1%	2.0%	0.4%	<0.1%	1.8%
Troop H	49,910	79.8%	70.0%	16.1%	10.8%	9.9%	2.2%	0.6%	<0.1%	1.0%
Troop T	46,657	76.2%	70.2%	16.6%	7.6%	6.3%	3.3%	0.5%	0.1%	3.1%
AREA III	80,809	**84.6%**	**74.2%**	**11.0%**	**11.9%**	**10.6%**	**1.4%**	**0.3%**	**<0.1%**	**2.0%**
Troop F	32,452	87.9%	83.9%	8.2%	4.7%	4.2%	1.3%	0.4%	<0.1%	2.0%
Troop N	25,130	78.0%	57.4%	16.0%	23.8%	21.0%	2.1%	0.4%	<0.1%	3.1%
Troop P	12,455	88.5%	82.3%	8.5%	7.8%	6.5%	0.6%	0.1%	<0.1%	2.1%
Troop R	10,772	85.5%	75.2%	10.6%	11.2%	10.4%	1.5%	0.2%	0.0%	2.2%
AREA IV	105,481	**70.0%**	**53.4%**	**24.4%**	**18.8%**	**16.8%**	**2.2%**	**0.4%**	**<0.1%**	**2.4%**
Troop J	37,865	74.9%	59.6%	21.4%	16.6%	15.4%	2.1%	0.5%	<0.1%	1.0%
Troop K	24,265	48.3%	39.1%	44.2%	10.9%	9.6%	2.8%	0.6%	<0.0%	3.8%
Troop L	21,007	84.5%	64.4%	11.6%	22.8%	20.2%	1.3%	0.2%	0.1%	2.2%
Troop M	22,344	71.8%	48.2%	19.9%	27.5%	23.8%	2.8%	0.4%	<0.1%	4.9%

EXAMINING DISPARITIES IN TRAFFIC STOPS

Veil of Darkness

As an alternative to benchmark analyses, the research team employs various methods, one of which is the Veil of Darkness (VOD) approach. As described in Section 2, this method analyzes a specific subset of stops occurring during the inter-twilight period, a time when natural changes in daylight vary throughout the year. This analysis seeks to determine the differences in the likelihood of Black or Hispanic drivers being stopped in daylight versus in darkness. The subsample in this analysis includes 67,660 traffic stops (15.6% of all stops in 2024), which take place from the earliest dusk at 5:11 pm to the latest sunset at 9:07 pm.[30]

[30] Sunset is defined as "the time the sun is level with the horizon, whereas dusk is when the sun is six degrees below the horizon" (Knode et al., 2024, 3). Daylight includes stops before sunset and darkness includes stops after dusk. Stops occurring between sunset and dusk, when it is neither daylight or dark and the amount of light changes rapidly, are excluded in accordance with previous research (Grogger & Ridgeway, 2006).

Using this subset of stops, two regression models are estimated that independently predict stops involving Black and Hispanic drivers. In addition to incorporating the *daylight* variable of interest, the models also include control variables for PSP Troop, the day of the week, time of day, whether the stop occurred on the interstate, whether the stop was made by a PSP member assigned to patrol, and seasonal variations.[31] The Appendix contains the complete regression results. In brief, the variable of interest—daylight—demonstrates that Black and Hispanic drivers are marginally (1.2 and 1.1 times, respectively) more likely to be stopped in daylight than in darkness. Although statistically significant, these are not substantively meaningful differences. As mentioned in Section 2, odds ratios ranging from 1.0 to 1.5 are generally deemed substantively small (Chen et al., 2010). [32]

There is insufficient evidence to suggest that drivers of any race/ethnicity are more or less likely to be stopped when lighting conditions favor observing drivers' characteristics.

Bivariate Analyses of Stops for Minor Violations

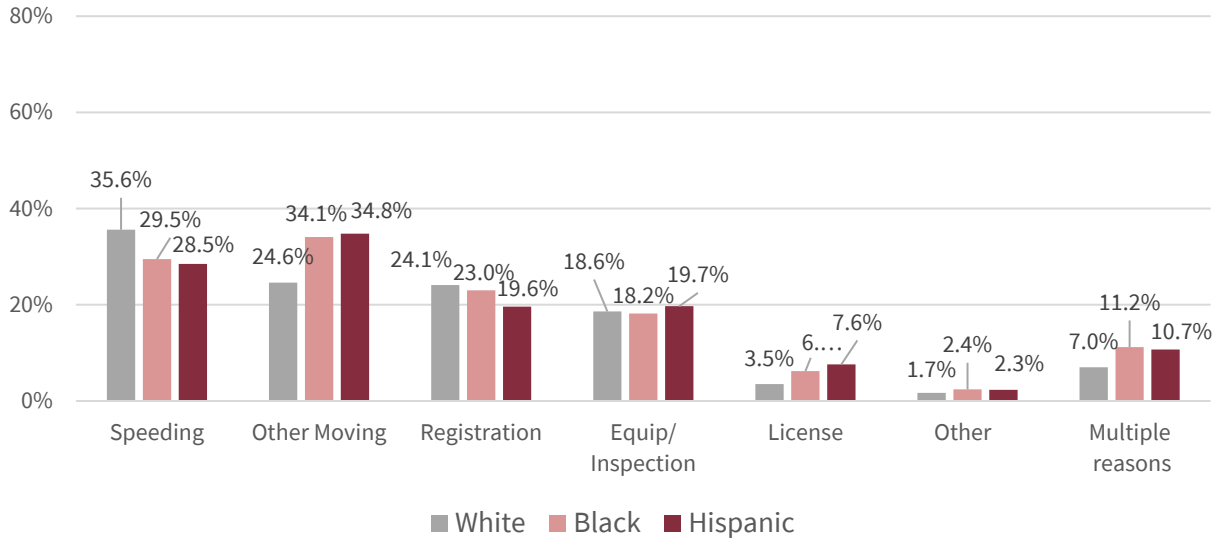
Another approach to assessing potential racial/ethnic disparities in traffic stops involves analyzing the initial reason for these stops. As highlighted in Section 2, various jurisdictions across the country have implemented new laws or policies regarding officers' traffic enforcement stemming from the belief that certain low-level, non-moving violations are disproportionately used against drivers of color for "pretextual" reasons (Boehme & Mourtgos, 2024; Fliss et al., 2020; Holder, 2023). While we cannot determine with these data whether stops conducted by the PSP for violations related to equipment, registration, and inspection are conducted for pretextual purposes (which is lawful under *Whren v. U.S.*, 1996), we explore whether racial and ethnic differences exist across different reasons for the stop that may warrant further examination.

Figure 3.4 illustrates the bivariate relationships between race/ethnicity and the reasons for PSP traffic stops, including instances where drivers were stopped for multiple reasons. Some statistically significant differences exist for all stop reasons, as well as for multiple reasons combined. However, the racial and ethnic differences for stops for violations related to registration, equipment, and inspection are very small (as measured by the Cramer's V statistic), suggesting these marginal differences are not substantively important.

[31] A quasibinomial link function accounts for the error distribution of our dichotomous outcome (Knode et al., 2024).

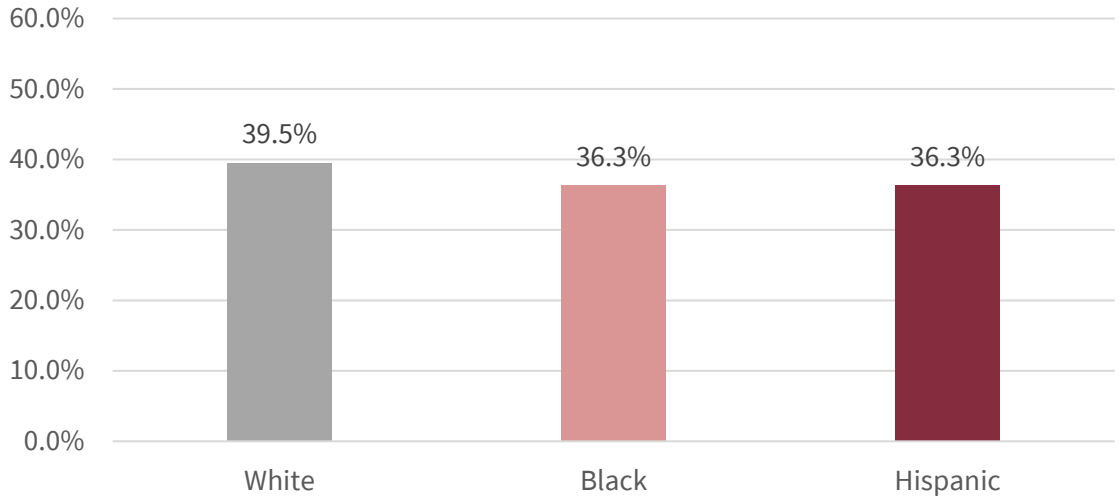
[32] Various VOD analyses of traffic stop data from different state police agencies have shown comparable results, revealing either substantively small or no statistically significant differences (see, for instance, Knode et al., 2024; RIPA Board, 2021, 2022, 2023; Ross & Barone, 2024; Wolfe et al., 2021).

Figure 3.4. Reasons for Stop by Race/Ethnicity



Given that drivers could be stopped for multiple reasons, it is more informative to examine the racial/ethnic differences in traffic stops that occurred *only based on minor violations*. In the analyses reported in Figure 3.5 below, the 165,306 stops that occur for only minor violations (i.e., stops conducted for only registration, equipment, or license violations) are examined (38.1% of all traffic stops). In these situations – where the only reason for the stop is a minor violation, Black and Hispanic drivers are *less likely* to be stopped than White drivers. This statistically significant difference is substantively small, and does not account for any other factors that might impact stops for minor violations – but it is in the opposite direction of what would be expected if Troopers were making "pretextual" stops of Black and Hispanic drivers.

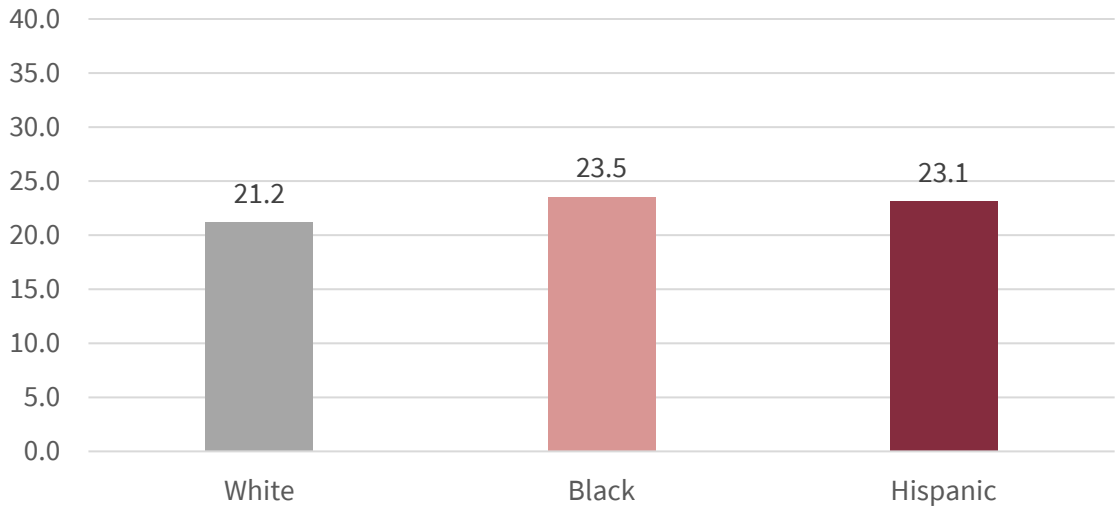
Figure 3.5. Traffic stops for Only Minor Reasons by Race/Ethnicity (n=165,306)*



*Minor reasons include equipment, inspection, or license violations.

One final bivariate analysis that provides additional insight for examining racial/ethnic disparities in stopping decisions involves the largest category of reason for the stop – speeding violations. Of the 433,599 member-initiated traffic stops in 2024, 34.3% (n=148,887 stops) were for speeding violations, with the average speed recorded as 21.7 mph over the posted speed limit. An examination of the average speed over the limit by racial/ethnic groups is provided in Figure 3.6 below. It demonstrates statistically significant, but substantively small differences in the average amount over the limit for which drivers of different racial/ethnic groups were stopped. These differences again are in the opposite direction of what might be expected if PSP Troopers were stopping Black and Hispanic drivers for more minor offenses. Of motorists stopped for speeding, White drivers were traveling on average 21.2 mph over the speed limit, compared to an average of 23.5 mph for Black drivers and 23.1 mph for Hispanic drivers. These findings are consistent with previous research that has shown racial/ethnic differences in speeding behavior (Cherkauskas, 2011; Lange et al., 2005; Tillyer & Engel, 2012).

Figure 3.6. Average Amount (MPH) Over the Speed Limit by Race/Ethnicity for Speeding Stops



Collectively, these bivariate findings on the reason for the stop – combined with the VOD analysis – suggest *there is no concerning evidence of racial/ethnic disparities in the initial stopping decisions by the PSP.*

Section Summary

Section 3 described the characteristics of traffic stops and drivers across PSP organizational units, drawing on data from 433,599 stops recorded between Jan 1 and Dec 31, 2024. Considerable variations are noted in stop characteristics, reasons for stops, and driver characteristics across different PSP organizational units. Some differences are anticipated and likely influenced by factors including geography, road conditions, jurisdiction, traffic patterns, and the demographic makeup of residents and visitors across the state.

Most traffic stops in the department show the following characteristics:

- Occurred on weekdays (70.8%)
- Took place during the day (66.3%)
- Happened on state highways (54.8%) or interstates (33.3%)
- Involved vehicles registered in Pennsylvania (81.6%)
- Included vehicles with no passengers (84.0%)
- Lasted from 1 to 15 minutes (91.3%)

The primary reason for stops department-wide is speeding (34.3%), with an average of 21.7 mph over the limit, followed by other moving violations (27.3%), registration violations (23.2%), and equipment/inspections violations (18.3%).

Driver characteristics across the department include:

- Average age of 39.0 years
- 67.0% male
- Driver behavior is overwhelmingly civil (98.4%), with only a small percentage of stops involving disrespectful, non-compliant, or resistant drivers
- 82.9% are Pennsylvania residents
- Racial demographics include: White non-Hispanic (71.3%), Black (15.0%), Hispanic White (9.0%), Asian (2.0%), American Indian or Alaskan Native (0.4%), and unknown race and ethnicity (2.0%)

Analyses of the initial traffic stop using various analytical methods revealed *no substantively significant racial or ethnic disparities*.

- The Veil of Darkness method, used as an alternative to benchmark analysis, indicates that Black and Hispanic individuals are 1.2 and 1.1 times more likely to be stopped in daylight rather than dark. These differences are considered substantively small.
- There are minor racial/ethnic differences in the initial reason for the stop, however the differences in stops for registration, equipment, and inspection violations (minor violations) are substantively very small.
- Substantively small racial/ethnic differences observed for traffic stops involving *only minor offenses* are in the opposite direction of what would be expected if minor violations were used as pretextual stops of Black and Hispanic drivers.
- Analyses of the average amount over the limit for speeding stops show substantively small differences across racial/ethnic groups. When stopped for speeding violations, Black and Hispanic drivers are slightly *more likely* to be stopped for *higher* speeds over the limit compared to White drivers. These differences again are in the opposite direction of what might be expected if PSP Troopers were stopping Black and Hispanic drivers for more minor offenses.

4. TRAFFIC STOP ENFORCEMENT OUTCOMES

Section 4 presents the enforcement results of traffic stops initiated by members in 2024. It first outlines the percentage of stops that led to warnings, citations, arrests, any searches, and discretionary searches of motorists, including basic descriptive statistics [33] at the Department, Area, and Troop levels. Building on these descriptive statistics, this section further includes significance testing results from statistical models that predict the likelihood of traffic stops resulting in warnings, citations, arrests, and searches. This section focuses on three main analyses: (1) bivariate analyses that explore the relationship between traffic stop outcomes and driver characteristics, (2) more advanced multivariate regression analyses that assess the strength of factors influencing whether warnings, citations, arrests, and searches occur, and (3) the predicted probabilities for individual variable impact during traffic stops.

Description of Traffic Stop Outcomes

OVERVIEW

From Jan 1 to Dec 31, 2024, PSP Troopers conducted 433,599 traffic stops, which could lead to one or more post-stop enforcement outcomes for drivers (e.g., a driver might receive both a warning and a citation during the same stop). Just over one-fifth (20.6%) of the stopped drivers (n=89,846) experienced multiple enforcement actions, which could include warnings, citations, or arrests.

Of the stops conducted in 2024, PSP Troopers issued a total of 249,306 warnings to drivers (57.5% of all stops); of these warnings, 76.1% were written (n=189,691) and 23.9% were verbal (n=59,615). For traffic stops involving at least one warning, 18.5% included multiple warnings issued.

More than half (56.8%) of traffic stops (n=246,102) resulted in at least one citation being issued to the driver. Of the stops involving at least one citation, 16.1% received two citations, and 11.4% received three or more citations.

Physical in-custody arrests of drivers occurred during 3.7% of member-initiated traffic stops (n=16,053). A slightly larger percentage of stopped drivers (4.5%) were searched (n= 19,522).

[33] Although PSP also captures stop outcomes for passengers, this report focuses exclusively on enforcement actions involving drivers because only 16.0% of the stops involved passengers and enforcement outcomes for them are rare.

An alternative way to examine enforcement outcomes involves creating a **severity index** that captures the most severe result for each traffic stop. This severity index classifies stops based on a ranking of outcome severity. Warnings (either verbal or written) are classified as the least severe, followed by citations, and then arrests. Searches are not included in the severity index. For example, if a driver is given both a warning and a citation, the most severe outcome on the severity index is a citation. The 2024 severity index shows that the *most severe outcome* was a warning for 38.9% of stops, a citation for more than half of the traffic stops (54.6%), and arrest of the driver in 3.7% of stops.

Any Enforcement Action
Warning = 57.5% of stops
Citation = 56.8% of stops
Arrest = 3.7% of stops
Search = 4.5% of stops

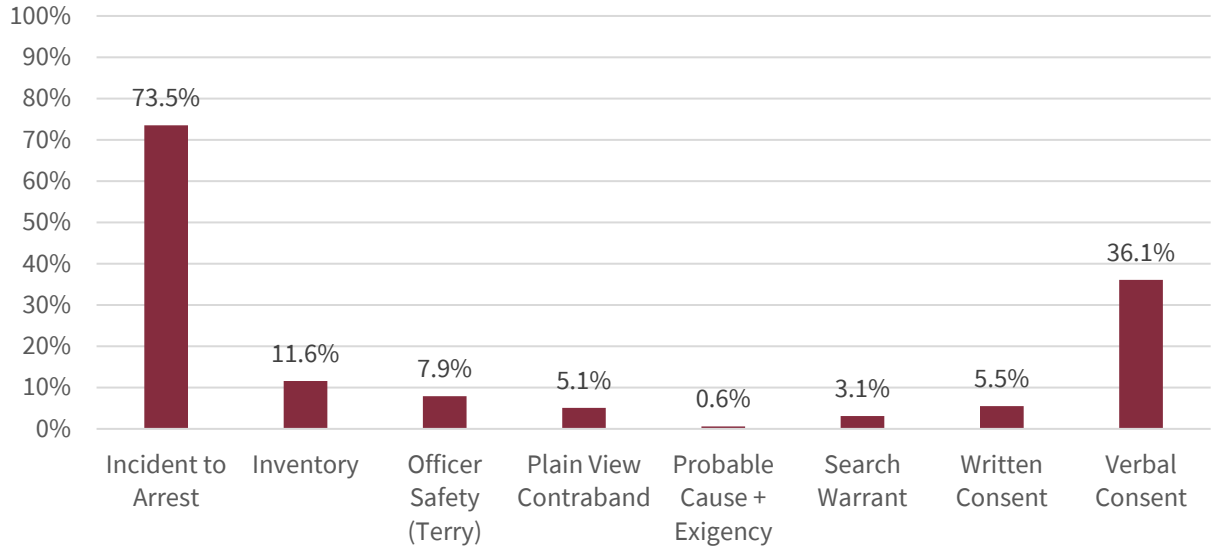
Most Severe Enforcement Action
Warning = 38.9% of stops
Citation = 54.6% of stops
Arrest = 3.7% of stops

Spotlight on Searches

In 2024, PSP Troopers conducted some type of search during 19,522 traffic stops (4.5% of stops), a slight increase from the 4.2% of stops that resulted in searches in 2023. The search count may include searches of drivers, passengers, and/or vehicles.

PSP Troopers are required to identify *all* relevant reasons leading to searches during traffic stops. As shown in Figure 4.1, the most common reason for search was incident to arrest (73.5%), followed by verbal consent (36.1%). About 34% of stops with searches cited multiple reasons for the search. The Appendix includes tables detailing the reasons for all searches at the Area, Troop, and Station levels. Nearly all searches occur roadside (97.1%); the remaining searches involve vehicles that are towed and examined elsewhere. Approximately 44.8% of searches involve only the driver, while 31.8% involve both the driver and the vehicle, 13.2% pertain solely to the vehicle, and 6.9% concern the driver, the vehicle, and at least one passenger.

Figure 4.1. Reasons for Traffic Stop Searches in 2024 (n=19,522 searches)



In addition to examining all searches, the research team also considered what we describe as *discretionary searches.*[34] Analyses examining discretionary searches focus only on traffic stops with searches conducted for non-mandatory reasons (i.e., excluding searches incident to arrest and vehicle inventory). Analyses are sometimes conducted on this subset of searches to further examine decision-making and outcomes (e.g., seizures) that occur when troopers' discretion is less likely to be influenced by specific departmental policies, regulations, or legal requirements. Discretionary searches – based on responsible suspicion, plain view, probable cause, or motorists' written or verbal consent – are more within a trooper's direct control. For analyses examining discretionary searches, the 10,052 searches arising strictly from incident to arrest or inventory (51.5% of all searches) are excluded. In 2024, 2.2% of traffic stops included discretionary searches (n=9,468). For the seizure analyses of discretionary searches (conducted in Section 5), the individual discretionary search types are further collapsed into: (1) reasonable suspicion / probable cause, or (2) consent.[35]

STOP OUTCOMES BY ORGANIZATIONAL UNITS

Traffic stop outcomes (e.g., warnings, citations, arrests, any search, and discretionary searches) are detailed at the Department, Area, and Troop levels in Table 4.1. As previously

[34] For other scholarly discussion of discretionary and consent searches, see Briggs & Keimig, 2017; Chanin et al., 2018; Dias et al., 2024; Fridell, 2004; Rojek et al., 2012; Rosenfeld et al., 2012; Tillyer & Klahm, 2015; Tillyer et al., 2012; Vito et al., 2019.

[35] An individual traffic stop can have multiple reasons indicated for a search. If a search was conducted for both discretionary and mandatory reasons, it is included in the discretionary searches. If a discretionary search was based on multiple reasons (e.g., probable cause and consent), it is categorized as probable cause.

mentioned, the total percentages exceed 100% since drivers can receive multiple enforcement outcomes from a single stop.

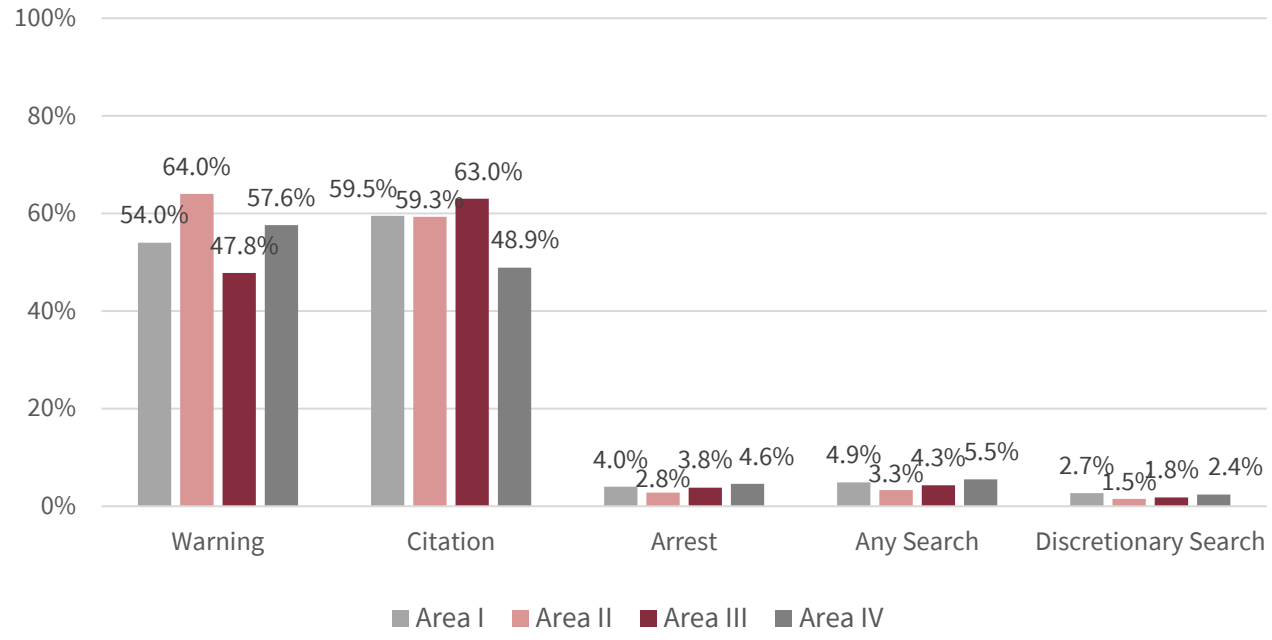
Table 4.1. Drivers' Post-Stop Outcomes by Department, Area & Troop, Jan – Dec 2024

	Total # of Stops	Warning	Citation	Arrest	Any Search	Discretionary Search
PSP Dept.	**433,599**	**57.5%**	**56.8%**	**3.7%**	**4.5%**	**2.2%**
AREA I	**100,938**	**54.0%**	**59.5%**	**4.0%**	**4.9%**	**2.7%**
Troop B	26,975	44.2%	63.9%	3.9%	5.2%	3.1%
Troop C	27,575	58.9%	61.4%	3.6%	4.1%	2.2%
Troop D	20,571	54.6%	57.2%	5.8%	6.7%	3.7%
Troop E	25,817	58.7%	54.7%	3.2%	3.9%	2.0%
AREA II	**140,660**	**64.0%**	**59.3%**	**2.8%**	**3.3%**	**1.5%**
Troop A	17,641	54.6%	62.5%	3.7%	4.2%	1.6%
Troop G	26,452	57.2%	64.6%	3.1%	3.4%	1.7%
Troop H	49,910	72.3%	39.1%	4.6%	5.5%	2.7%
Troop T	46,657	62.4%	76.6%	0.3%	0.4%	0.2%
AREA III	**80,809**	**47.8%**	**63.0%**	**3.8%**	**4.3%**	**1.8%**
Troop F	32,452	56.5%	55.9%	2.4%	2.9%	1.3%
Troop N	25,130	40.4%	66.3%	6.5%	7.1%	2.3%
Troop P	12,455	44.2%	68.3%	2.2%	2.6%	1.3%
Troop R	10,772	43.0%	70.3%	3.3%	4.1%	2.3%
AREA IV	**105,481**	**57.6%**	**48.9%**	**4.6%**	**5.5%**	**2.4%**
Troop J	37,865	64.5%	41.7%	4.6%	5.2%	2.2%
Troop K	24,265	55.1%	48.9%	4.8%	6.3%	2.8%
Troop L	21,007	45.0%	62.9%	3.9%	4.6%	2.3%
Troop M	22,344	60.3%	47.8%	5.1%	5.9%	2.2%

Table 4.1 and Figure 4.2 show that post-stop outcomes differ across PSP Areas. Troopers in Area II issued the highest percentage of warnings to drivers at 64.0%, while those in Area III issued the lowest at 47.8%. Drivers in Area III are most likely to receive citations (63.0%), whereas those in Area IV are the least likely at 48.9%. Additionally, Troopers in Area II have the lowest rates of arrests, any searches, and discretionary searches among stopped drivers, at 2.8%, 3.3%, and 1.5%, respectively. Area IV shows the highest rates for arrests and any searches at 4.6% and 5.5%, while Area I has the highest discretionary search rate at 2.7%.

The frequency of warnings issued by Troops also varies; Troop H reports that 71.0% of stopped motorists receive warnings, whereas Troop N reports a lower rate of 40.4%. Troop T has the highest percentage of drivers cited at 80.0%, while Troop J has the lowest at 41.7%. Additionally, the proportion of traffic stops that lead to arrests ranges from a high of 5.1% in Troop D to a low of 0.3% in Troop T. The highest percentage of both searches overall (any reason) and discretionary searches was reported by Troop D (6.7% and 3.7%, respectively), while Troop T reports the lowest (0.4% and 0.2%, respectively).

Figure 4.2. Post-Stop Outcomes by PSP Area, Jan - Dec 2024



Bivariate Analyses of Traffic Stop Outcomes

As outlined in Section 2, bivariate analyses focus on the relationship between just two variables—e.g., drivers' race/ethnicity and post-stop outcomes—without accounting for other factors that might influence this relationship. First, the race/ethnicity of drivers, categorized as White, Black, or Hispanic, is assessed against all traffic stop outcomes. Due to the low number of stops involving drivers identified as American Indian or Alaskan Native, Asian or Pacific Islander, Two or More Races, or unknown, these cases are excluded from the analysis. Second, the analysis explores the connection between driver gender and stop outcomes, considering all traffic stops where the driver's gender has been recorded.[36] The Appendix contains tables at the Area, Troop, and Station levels that detail the total number of stops by race/ethnicity and gender. It also shows the percentage of drivers from each group who received warnings, citations, arrests, or searches for discretionary reasons. Only the differences at the department level are presented and analyzed in this section.

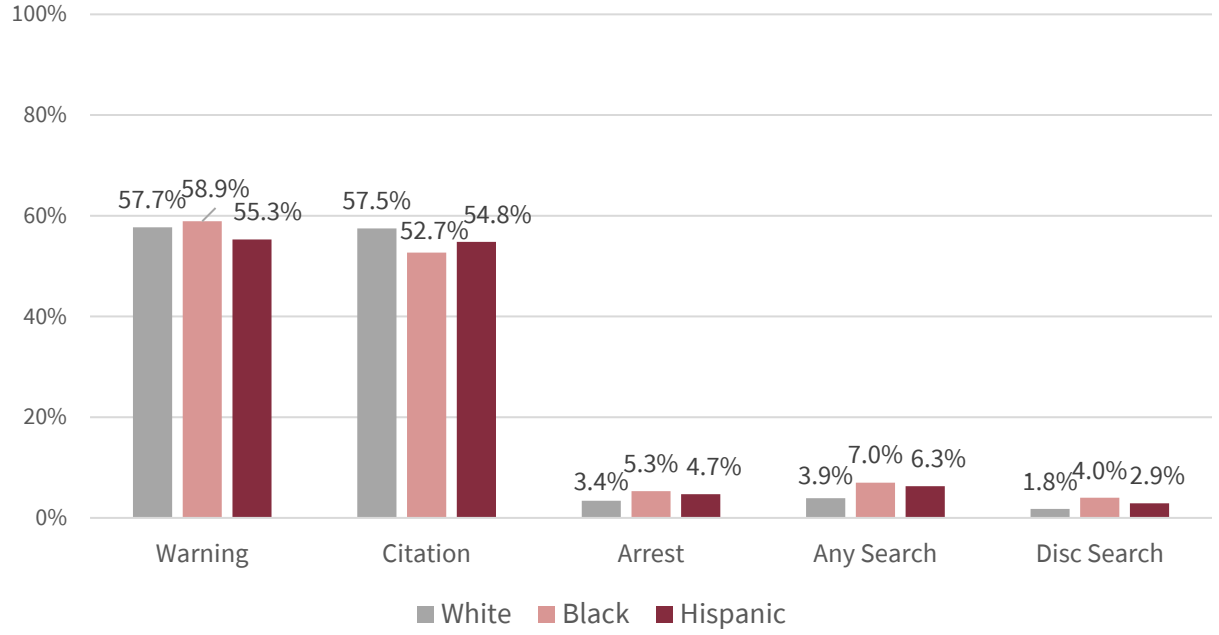
Figures 4.3 and 4.4 illustrate the variation in post-stop outcomes (i.e., warnings, citations, arrests, searches, any searches, and discretionary searches) by drivers' race/ethnicity and gender, respectively. Across the department, there are statistically significant bivariate differences in the rate of all traffic stop outcomes depending on drivers' race/ethnicity. Hispanic motorists are least likely to receive warnings. White drivers are significantly more likely to receive a citation (57.5%) than Black and Hispanic drivers (52.7% and 54.8%, respectively). Black and Hispanic drivers are significantly more likely than White drivers to be arrested (5.3% and 4.7%, respectively, compared to 3.4%). Black and Hispanic drivers are

[36] It excludes the 708 cases (<0.2%) where driver gender is reported to be unknown.

significantly more likely than White drivers to be subject to any search (7.0% and 6.3%, respectively, compared to 3.9%), and they are significantly more likely to be subject to a discretionary search than White drivers (4.0% and 2.9%, respectively, compared to 1.8%). *Based on the Cramer's V statistic for effect sizes, these all represent substantively small racial/ethnic differences.*

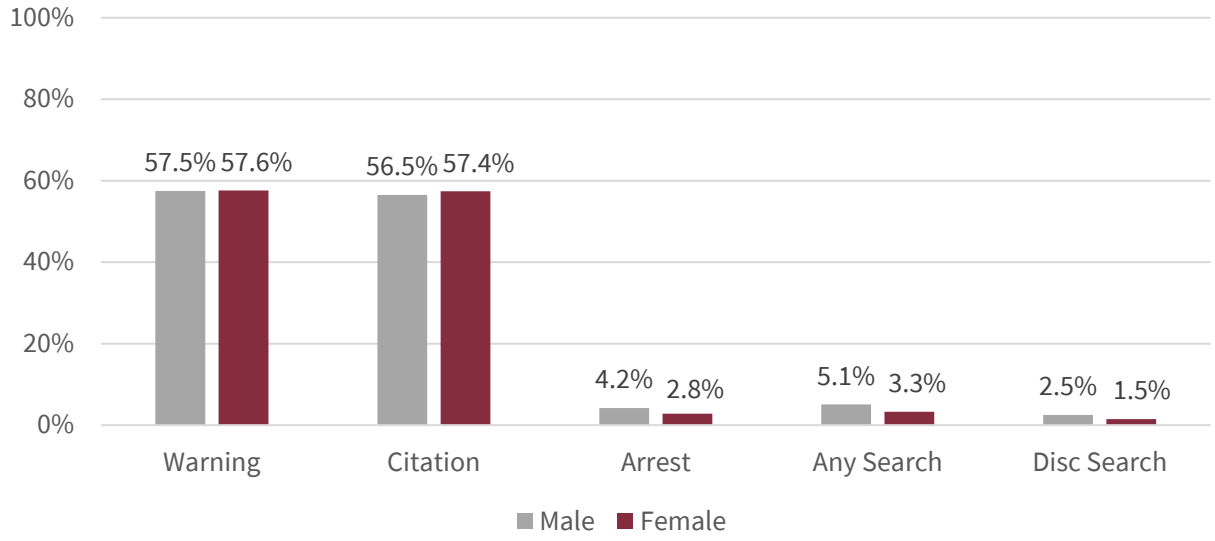
Figure 4.4 displays differences in the frequency of traffic stop outcomes based on driver gender. There are no statistically significant differences for warnings. Female drivers are slightly more likely to be cited, while male drivers are more likely to be arrested or searched. *Based on the Cramer's V statistic for effect sizes, these all represent substantively small gender differences.*

Figure 4.3. Bivariate Racial/Ethnic Differences in 2024 Traffic Stop Outcomes



NOTE: These are all statistically significant bivariate relationships at p-value < 0.001

Figure 4.4. Bivariate Gender Differences in Traffic Stop Outcomes



NOTE: The gender differences for warnings are not statistically significant. The remainder are statistically significant bivariate relationships at p-value < 0.001.

Bivariate analyses shown do not account for other pertinent factors that may impact troopers' decision-making during traffic stops.

It is essential to emphasize that the bivariate relationships shown in these figures and the tables in the appendix do not statistically account for other pertinent legal and extralegal factors that could affect troopers' decision-making. This information is provided solely to inform PSP administrators about variations in post-stop outcomes at different organizational levels. It should *not* be used to solely evaluate whether disparities in outcomes by race/ethnicity or gender group stem from trooper bias. It is plausible that differences in post-stop outcomes based on race/ethnicity and gender arise from other legal and extralegal factors. More sophisticated statistical analyses that incorporate other legally relevant variables are detailed below to investigate these potential influences.

Multivariate Binary Logistic Regressions

As explained in Section 2, multivariate analyses are statistical methods for estimating that simultaneously consider multiple independent predictors for a specific outcome. Since traffic stop enforcement actions are recorded as binary (0 = did not occur, or 1 = occurred) for (1) warnings, (2) citations, (3) arrests, or (4) searches, binary logistic regression is employed to assess the effects of different factors such as driver, vehicle, situational, trooper characteristics, and legal variables. These statistical models determine which individual factors, given similar situations, predict enforcement outcomes.

As outlined in Section 2, to complement the binary logistic regression models, we calculate *predicted probabilities* to estimate more precisely how specific variables (e.g., drivers' race and ethnicity) influence stop outcomes. Previously, Table 4.3 showed the raw percentages for each enforcement outcome by drivers' race/ethnicity. However, these descriptive percentages do not consider additional information. When other factors are included, the baseline probability of an event is altered. By calculating the predicted probabilities for White, Black, and Hispanic drivers based on various situational and legal characteristics of stops, we can more accurately estimate the differences in the likelihood of arrests or searches among drivers of different racial and ethnic backgrounds, assuming all else is equal (i.e., all other variables in the models are set to their mean values). The interpretation of a predicted probability is simply the likelihood that an event will occur. Therefore, following the reported findings of the individual logistic regression models, we included the predicted probabilities of a given outcome occurring (e.g., warning, citation, arrests, searches) by racial/ethnic group.

DESCRIPTIVE STATISTICS

Each multivariate model presented includes various independent variables that may affect drivers' enforcement outcomes, which are described below. All are binary or dichotomous because they can only have two possible values, indicating the presence or absence of a characteristic. The individual measures with missing data overlap, so the final total of cases for analysis (n=432,880) equates to 99.8% of the total distribution of stops. Table 4.2 provides the summary statistics for the variables in the final datasets used for multivariate analyses.

Legal Variables

- **Reason for the stop:** measured as six variables, where 0 = no and 1 = yes, for each individual reason for the stop (speeding, equipment only, license only, moving only, registration only, and "other" violations); speeding is treated as the reference category (excluded) in the analyses
- **Multiple reasons for the stop:** 0 = single reason for stop and 1 = two or more reasons for stop
- **Special Traffic Enforcement:** variable for stops associated with specific PSP initiatives or programs, where 0 = no and 1 = yes
- **Evidence Seized**: 0 = no and 1 = yes, for contraband seizure during a search (variable excluded from the models predicting any search and discretionary search)
- **Criminal history:** 0 = no and 1 = yes, for queries indicating a criminal history

Driver Characteristics

- **Race/Ethnicity:** measured as five variables, where 0 = no and 1 = yes for White (not-Hispanic), which is the reference category,[37] and Black, Hispanic (White), Other (including American Indian or Alaska Native, Asian or Pacific Islander, Two or More Races) and Unknown Race and Ethnicity.
- **Gender**: 0 = female and 1 = male[38]

[37] This means that the effects of race/ethnicity variables reported in the models are *in comparison to* Whites.
[38] Cases where gender is "unknown" (n=708) are excluded from the final dataset for multivariate analyses.

- **Young driver:** where driver age 25 or older = 0 and 1 = under 25
- **Civil behavior**: 0 = disrespectful, non-compliant, verbally or physically resistant, and 1 = civil
- **Limited English Proficiency:** 0 = no and 1 = yes

Vehicle Characteristics

- **PA vehicle registration**: 0 = out of state registration and 1 = PA registration
- **Passengers**: 0 = no passengers, and 1 = one or more passengers in the vehicle

Situational Characteristics

- **Daytime**: 0 = nighttime and 1 = daytime
- **Weekday**: 0 = weekend and 1 = weekday
- **Summer months:** 0 = Jan – May & Sept – Dec and 1 = June, July & August
- **Interstate**: 0 = state, county, or other road, and 1 = interstate

PSP Member Characteristics

- **Gender**: 0 = female and 1 = male
- **Race/ethnicity**: 0 = White and 1 = Non-White
- **Experience**: 0 = more than 3 years and 1 = 3 years or less with the PSP
- **Patrol Assignment**: 0 = non-Patrol and 1 = Patrol
- **Trooper Rank**: 0 = Corporal and above and 1 = Trooper

Table 4.2. Descriptive Statistics for Final Dataset Used for Multivariate Analyses

	Jan 1 – Dec 31, 2024 N=432,880			
Dependent Variables	Mean	Stnd Dev	Min	Max
Any Warning	0.575	0.494	0	1
Citation	0.568	0.495	0	1
Arrest	0.037	0.189	0	1
Any Search	0.045	0.207	0	1
Discretionary Search	0.022	0.146	0	1
Independent Variables				
Legal Measures				
Speeding Only (Reference category)	0.313	0.464	0	1
Equipment Only Violation	0.144	0.351	0	1
License Only Violation	0.023	0.150	0	1
Moving Only Violation	0.236	0.425	0	1
Registration Only Violation	0.191	0.393	0	1
Other Only Violation	0.013	0.113	0	1
Multiple Reasons (2+ violations)	0.080	0.271	0	1
Special Traffic Enforcement	0.168	0.374	0	1
Evidence Seized in Stop	0.016	0.125	0	1
Criminal History Detected	0.029	0.169	0	1
Driver Characteristics				
White (Reference)	0.713	0.452	0	1
Black	0.150	0.357	0	1
Hispanic	0.090	0.286	0	1
Other Race	0.024	0.152	0	1
Unknown Race and Ethnicity	0.019	0.136	0	1
Male	0.672	0.470	0	1
Driver Under 25 Years Old	0.191	0.393	0	1
Driver Behavior Civil	0.984	0.124	0	1
Limited English Proficiency	0.006	0.074	0	1
Vehicle Characteristics				
Pennsylvania Plate Registration	0.816	0.388	0	1
Passengers Present	0.160	0.367	0	1
Situational Characteristics				
Daytime	0.664	0.472	0	1
Weekday (Mon-Thurs)	0.708	0.455	0	1
Summer Months (June-August)	0.259	0.438	0	1
Interstate	0.333	0.471	0	1
PSP Member Characteristics				
Male Trooper	0.948	0.222	0	1
Non-White Trooper	0.063	0.244	0	1
3 Years or Less Experience	0.348	0.476	0	1
Patrol Assignment	0.961	0.194	0	1
Trooper Rank	0.948	0.222	0	1

WARNINGS

Table 4.3 below reports the binary logistic regression model examining warnings as the outcome in the stops (compared to all other outcomes). This model has a Nagelkerke R-square value of 0.118, which indicates a moderate model fit.

The most important, consistent, and robust predictors of warnings are legal measures. Most odds ratios fall within a medium-to-large range, indicating a moderate to strong association with receiving a warning. Stops for equipment-only violations are 2.9 times more likely to result in a warning than stops for speeding. Moving-only violations (odds ratio = 2.7) also significantly increase the chances of receiving a warning, independent of other factors. Stops with multiple reasons are 2.4 times more likely to result in a warning than those with single violations, suggesting that multiple reasons make a warning more probable, all else being equal. Moreover, stops for registration-only violations are 1.9 times more likely to lead to a warning than speeding stops. Finally, the strongest and most robust effect, relative to other factors, occurs when evidence is seized, making the stop 14.9 times less likely to result in a warning. Criminal history is the only legal variable without a statistically significant impact on the odds of a driver receiving a warning.

The models also consider the drivers' characteristics, such as demographics, behavior, and English proficiency. When a trooper reports the driver's behavior as civil, the likelihood of receiving a warning is 3.0 times higher than for drivers engaging in disrespectful, noncompliant, or resistant behavior, after accounting for all other factors. Drivers who are Black, Hispanic, or of unknown race and ethnicity are all slightly less likely than White drivers to receive a warning, all else equal. However, all odds ratios are less than 1.5, indicating these are not substantively important differences. The remaining statistically significant odds ratios for driver characteristics (gender, limited English proficiency) are below 1.3, indicating the effect sizes are not salient or meaningful.

The only substantively significant situational characteristic predicting warnings is the stop's time of day. Daytime stops are 1.6 times less likely to lead to a warning than nighttime stops, which serve as the reference category.

Given the low odds ratios in the estimates (less than 1.3), troopers' characteristics are neither strong nor prominent predictors of warnings. The only exception to the influence of trooper characteristics on warnings is that troopers assigned to patrol are 1.7 times less likely than other troopers to issue warnings.

Warning Predicted Probabilities

After accounting for all other measured factors (holding them constant at their mean), the predicted probability of a warning during a traffic stop is 57.9%. When examining across racial/ethnic groups, the likelihood of receiving a warning during a traffic stop after accounting for other factors, is very similar for White and Black drivers (58.9% and 57.7% of stops, respectively), but slightly *lower* for Hispanic drivers (52.6% of stops).

Table 4.3. Binary Logistic Regression Analyses Predicting WARNINGS During Traffic Stops in 2024 (n=432,880)

	Coefficient	St. Error	Odds Ratio
Intercept	-0.29	0.038	--
Legal Measures			
Equipment Only Violation	1.07*	0.011	2.91
License Only Violation	-0.15*	0.022	1.16
Moving Only Violation	0.98*	0.009	2.68
Registration Only Violation	0.63*	0.009	1.87
Other Only Violation	0.41*	0.028	1.50
Multiple Reasons	0.88*	0.013	2.42
Special Traffic Enforcement	-0.23*	0.009	1.25
Evidence Seized in Stop	-2.70*	0.039	14.94
Criminal History Detected	0.03	0.022	--
Driver Characteristics			
Black	-0.05*	0.009	1.05
Hispanic	-0.26*	0.012	1.29
Other Race	-0.04	0.021	--
Race & Ethnicity Unknown	-0.40*	0.023	1.49
Male	-0.05*	0.007	1.06
Driver Under 25 Years Old	-0.01	0.008	--
Driver Behavior Civil	1.10*	0.028	3.01
Limited English Proficiency	-0.18*	0.044	1.20
Vehicle Characteristics			
Pennsylvania Plate Registration	-0.27*	0.009	1.31
Passengers Present	0.03	0.009	--
Situational Characteristics			
Daytime	-0.49*	0.007	1.63
Weekday (Mon-Thurs)	0.06*	0.007	1.13
Summer Months (June-August)	0.01	0.007	--
Interstate	-0.01	0.007	--
PSP Member Characteristics			
Male Trooper	-0.09*	0.015	1.09
Non-White Trooper	-0.09*	0.013	1.09
3 Years Less Experience	0.08	0.007	--
Patrol Assignment	-0.54*	0.018	1.71
Trooper Rank	0.19*	0.010	1.21
Nagelkerke R-Square	0.118		

NOTE: *p < 0.001 Only odds ratios for statistically significant estimates are presented.
Odds Ratios for negative coefficients are calculated as 1/Exp(B), which equates to a value > 1.0, which we include as a negative odds ratio (-). This odds ratio can be interpreted as 'less likely' with the binary outcome.

CITATIONS

Table 4.4 below presents the binary logistic regression model demonstrating the estimates of driver citations as the outcome. This model has a Nagelkerke R-square value of 0.265, indicative of a robust model fit. This suggests a higher confidence in the findings predicting whether citations occur during traffic stops compared to warnings.

In the model, legal measures emerge as the most significant and consistent predictors for a stop concluding with a citation. Specifically, moving-only violations are 5.9 times less likely to lead to a citation compared to speeding, which serves as the reference category. Likewise, equipment-only violations are nearly 4.5 times less likely to result in a citation than drivers stopped for speeding. Other types of violations are also 5.9 times less probable to end with a citation when compared with stops that involve speeding. Lastly, registration violations are 2.8 times less likely to result in a citation in comparison to speeding violations. In summary, this indicates that being stopped for speeding is a strong predictor of receiving a citation in comparison to all other reasons. Furthermore, drivers with criminal histories are 1.9 times less likely to receive a citation. Stops that occur as part of a special traffic enforcement program are 1.8 times more likely to result in a citation than all other stops. Drivers with evidence seized are also 1.9 times more likely to receive a citation than drivers with no seizure.

Most driver demographic characteristics do not consistently predict whether stops result in citations. **The odds of a stop resulting in a citation are virtually indistinguishable between Black, Hispanic, and White drivers stopped.** Hispanic drivers are slightly more likely (1.1 compared with 1.0 as the baseline) to receive a citation relative to White drivers. When the driver's race is unknown, they are 1.7 times more likely to receive a citation than White drivers, net of other factors in the model. Neither driver's age nor gender is associated with any substantively important differences in the odds of receiving a driver citation. Drivers coded as behaving civilly are 3.0 times *less* likely to have the stop result in a citation than drivers engaging in disrespectful, noncompliant, or resistant behavior.

Some situational and PSP member characteristics predict whether stops result in citations. Specifically, stops during the day are 2.6 times more likely to result in a citation compared to those at night. Stops involving patrol troopers are 2.2 times more likely to end in a citation than stops involving troopers with other assignments. The influence of other trooper characteristics is negligible.

Citation Predicted Probabilities

After accounting for factors (i.e., holding other predictor variables constant at their mean), the probability of receiving a citation during a traffic stop is 58.4%. When examining across racial/ethnic groups, the likelihood of receiving a citation during a traffic stop is very similar for White, Black, and Hispanic drivers when accounting for other measured factors. The likelihood of receiving a citation during a traffic stop for White drivers is 58.0%, which is comparable to 57.0% for Black drivers, and 60.9% for Hispanic drivers.

Table 4.4. Binary Logistic Regression Analyses Predicting CITATIONS During Traffic Stops in 2024 (n=432,880)

	Coefficient	St. Error	Odds Ratio
Intercept	0.67	0.041	--
Legal Measures			
Equipment Only Violation	-1.51*	0.011	4.53
License Only Violation	-0.77*	0.023	2.15
Moving Only Violation	-1.78*	0.010	5.91
Registration Only Violation	-1.04*	0.010	2.84
Other Only Violation	-1.77*	0.030	5.85
Multiple Reasons	-0.24*	0.015	1.27
Special Traffic Enforcement	0.59*	0.010	1.80
Evidence Seized in Stop	0.64*	0.028	1.89
Criminal History Detected	-0.64*	0.022	1.89
Driver Characteristics			
Black	-0.04*	0.010	1.04
Hispanic	0.12*	0.012	1.13
Other Race	0.01*	0.023	--
Race & Ethnicity Unknown	0.54*	0.027	1.72
Male	0.08*	0.007	1.08
Driver Under 25 Years Old	0.09*	0.009	1.09
Driver Behavior Civil	-1.11*	0.030	3.02
Limited English Proficiency	0.13	0.047	--
Vehicle Characteristics			
Pennsylvania Plate Registration	0.40*	0.010	1.49
Passengers Present	0.16*	0.010	1.18
Situational Characteristics			
Daytime	0.95*	0.008	2.59
Weekday (Mon-Thurs)	-0.01*	0.008	--
Summer Months (June-August)	-0.06*	0.008	1.06
Interstate	0.18*	0.008	1.20
PSP Member Characteristics			
Male Trooper	-0.11*	0.016	1.12
Non-White Trooper	-0.18*	0.014	1.20
3 Years Less Experience	-0.25*	0.008	1.28
Patrol Assignment	0.80*	0.018	2.24
Trooper Rank	-0.13*	0.011	1.13
Nagelkerke R-Square	0.265		

*p < 0.001 Only odds ratios for statistically significant estimates are presented.
Odds Ratios for negative coefficients are calculated as 1/Exp(B), which equates to a value > 1.0, which we include as a negative odds ratio (-). This odds ratio can be interpreted as 'less likely' with the binary outcome.

ARRESTS

Table 4.5 reports the binary logistic regression model predicting driver arrests during traffic stops in 2024. The Nagelkerke R-square value for the arrest model demonstrates a robust fit (0.482), indicating we can have strong confidence in its findings.

Almost all legal measures are statistically significant and positive predictors of arrests during PSP traffic stops and demonstrate larger magnitude of effects than driver, vehicle, situational, and PSP member characteristics. As expected, the strongest predictor is evidence seized; the odds of arrest are 489 times greater when evidence is seized compared to no seizure. It is important to note the cross-correlation of these measures in real-world applications. There is no sequential ordering to these measures. For example, evidence seizure may lead to an arrest, but it can also be a response to a search conducted incident to arrest. Therefore, the relationship between any two measures, such as evidence seized and arrest, cannot be interpreted causally because we do not have information about the temporal order of events (Engel & Calnon, 2004b).[39]

Drivers with criminal histories are 8.3 times more likely to be arrested than drivers without one. Stops that occur for "other" reasons are 12.6 times more likely than speeding stops to result in driver arrests. Stops with moving violations and license-only violations are 5.1 times and 3.2 times more likely to result in an arrest than speeding stops. Likewise, if a stop has multiple reasons, the odds of the stop ending in a driver's arrest are 5.2 times more likely than drivers stopped for a single reason.

Regarding situational factors, daytime stops are 4.7 times less likely to result in an arrest than nighttime stops. Stops on the interstate are 2.3 times less likely to result in an arrest than other roadway types. PSP member characteristics are also significant predictors of arrest. Stops made by patrol officers are 2.9 times more likely to result in arrest, while stops made by troopers (compared to PSP members of other ranks) are 3.4 times less likely to result in arrest.

The odds of Black drivers being arrested are not statistically significantly different than White drivers. Hispanic drivers are about 1.2 times more likely to be arrested than White drivers, holding all else equal. Male drivers are 1.2 times more likely than female drivers to be arrested, net of all other factors and drivers under 25 years old are 1.3 times less likely to be arrested than drivers 25 years old or older. Note that all of the differences across demographic groups have substantively small effect sizes and therefore have a minor impact on predicting arrests.

[39] The bivariate correlation between evidence and arrest measures is 0.560, suggesting a relationship between the two, although they do not signify the same occurrence (i.e., arrests can happen without seized evidence, and less frequently, seizures can occur without arrests). We analyzed arrests both including and excluding "evidence seized." The model excluding evidence exhibited diminished predictability, demonstrated by the Nagelkerke R-square value falling from 0.482 to 0.303. Furthermore, the race estimates remain largely unchanged in both models (e.g., the odds ratio for Black drivers is 1.03 and not significant when evidence is included, but 1.1 and significant when evidence is omitted; for Hispanic drivers, the odds ratios are 1.16 and significant with evidence but drop to 1.02 and not significant without it). In summary, the presented arrest model incorporating evidence is a more uniform and parsimonious model.

Civil drivers are 5.1 times less likely to be arrested than drivers engaging in disrespectful, noncompliant, or resistant behavior. Stops involving drivers with limited English proficiency are 1.7 times more likely to result in arrests.

Arrest Predicted Probabilities

After holding other predictive factors constant at their mean, drivers have a 1.0% chance of being arrested during a PSP traffic stop, and the **likelihood of arrest is nearly identical for White, Black, and Hispanic drivers after accounting for other factors.** Specifically, the probability of being arrested during a traffic stop for White drivers is 1.0%, for Black drivers is 1.0%, and for Hispanic drivers is 1.1%. In contrast, a driver of any race or ethnicity with a criminal history has a 7.0% probability of being arrested during a traffic stop.

Table 4.5. Binary Logistic Regression Analyses Predicting ARRESTS During Traffic Stops in 2024 (n=432,880)

	Coefficient	St. Error	Odds Ratio
Intercept	-1.80	0.102	--
Legal Measures			
Equipment Only Violation	0.43*	0.048	1.54
License Only Violation	1.17*	0.067	3.22
Moving Only Violation	1.62*	0.039	5.06
Registration Only Violation	0.34*	0.050	1.41
Other Only Violation	2.53*	0.062	12.56
Multiple Reasons	1.64*	0.046	5.18
Special Traffic Enforcement	-0.51*	0.037	1.67
Evidence Seized in Stop	5.54*	0.046	255.48
Criminal History Detected	2.12*	0.032	8.29
Driver Characteristics			
Black	0.03	0.028	--
Hispanic	0.14*	0.033	1.16
Other Race	-0.49*	0.091	1.63
Race & Ethnicity Unknown	-0.96*	0.126	2.61
Male	0.22*	0.024	1.24
Driver Under 25 Years Old	-0.27*	0.028	1.31
Driver Behavior Civil	-1.63*	0.043	5.12
Limited English Proficiency	0.53*	0.104	1.70
Vehicle Characteristics			
Pennsylvania Plate Registration	0.35*	0.032	1.43
Passengers Present	0.13*	0.028	1.14
Situational Characteristics			
Daytime	-1.55*	0.025	4.69
Weekday (Mon-Thurs)	-0.57*	0.021	1.76
Summer Months (June-August)	0.15*	0.024	1.17
Interstate	-0.81*	0.029	2.26
PSP Member Characteristics			
Male Trooper	-0.27*	0.044	1.26
Non-White Trooper	-0.21*	0.043	1.22
3 Years Less Experience	-0.27*	0.024	1.18
Patrol Assignment	0.85*	0.066	2.85
Trooper Rank	-1.84*	0.028	3.44
Nagelkerke R-Square	0.482		

Note: *p < 0.001 Only odds ratios for statistically significant estimates are presented.
Odds Ratios for negative coefficients are calculated as 1/Exp(B), which equates to a value > 1.0, which we include as a negative odds ratio (-). This odds ratio can be interpreted as 'less likely' with the binary outcome.

SEARCHES

Table 4.6 presents the results of a binary logistic regression model predicting whether any search is conducted. The Nagelkerke R-square value of 0.314 indicates a well-fitted model.

All legal variables were statistically significant predictors of searches conducted during traffic stops. **Drivers with criminal histories are 20.3 times more likely to be searched during a traffic stop compared to those without. This is the strongest predictor of whether stop results in a search.** For other types of stops — such as those for "other" reasons, license-only violations, moving violations, and equipment violations (compared to speeding) — the likelihood of being searched is 11.9 times, 4.3 times, 5.0 times, and 2.5 times higher, respectively, compared to traffic stops for speeding. Additionally, stops for multiple reasons are 5.7 times more likely to result in searches. Finally, stops associated with special traffic enforcement programs are 1.7 times *less* likely to result in searches.

Stops involving passengers are 2.1 times more likely to lead to searches compared to stops involving only drivers. The PSP member characteristics significantly associated with searches are related to Trooper gender, assignment, and rank. Male troopers are 1.3 times less likely to conduct searches compared to female troopers, which is a substantively small effect size. Troopers assigned to patrol are also 1.3 times *less* likely to perform searches compared to troopers in other assignments (small effect size), while troopers are 3.7 times *less* likely to conduct searches than PSP members who hold the rank of corporal or higher, accounting for other factors.

Regarding differences across racial/ethnic groups, traffic stops of Black and Hispanic drivers are 1.2 and 1.1 times, respectively, more likely to result in a search compared to stops with White drivers, which are substantively small effect sizes. Finally, traffic stops with drivers of unknown race and ethnicity are 2.2 times *less* likely to result in searches compared to stops with White drivers.

The research team also estimated a multivariate logistic regression model predicting *discretionary search*. The table with these results is included in the Appendix. The findings are very similar, but two slight differences in the effects of race/ethnicity are noted. In the discretionary search model, the odds ratio for Black drivers is 1.4 and the odds ratio for Hispanic drivers is not significant.

Search Predicted Probabilities

After accounting for all other measured factors, the probability of being searched during a traffic stop is 1.8%. When other predictive factors are held constant at their average, stopped drivers have a 1.8% chance of being searched. Across racial/ethnic groups, the likelihood of being searched during a traffic stop is statistically rare and comparable for White, Black, and Hispanic drivers after accounting for other measured factors (White = 1.8%; Black = 2.2%; Hispanic = 2.0%). In contrast, for traffic stops involving drivers with criminal histories

(regardless of their race/ethnicity), the probability of being searched is 25.4%. This demonstrates that factors other than drivers' race/ethnicity have far greater influence over the likelihood of being searched during traffic stops.

Table 4.6. Binary Logistic Regression Analyses Predicting ANY SEARCHES During Traffic Stops in 2024 (n=432,880)

	Coefficient	St. Error	Odds Ratio
Intercept	-0.74*	0.074	--
Legal Measures			
Equipment Only Violation	0.93*	0.036	2.54
License Only Violation	1.45*	0.051	4.26
Moving Only Violation	1.62*	0.031	5.04
Registration Only Violation	0.58*	0.038	1.79
Other Only Violation	2.48*	0.051	11.93
Multiple Reasons	1.74*	0.035	5.71
Special Traffic Enforcement	-0.54*	0.028	1.72
Criminal History Detected	3.01*	0.024	20.23
Driver Characteristics			
Black	0.22*	0.021	1.24
Hispanic	0.12	0.025	1.13
Other Race	-0.30	0.065	1.35
Race & Ethnicity Unknown	-0.76*	0.094	2.15
Male	0.24*	0.019	1.27
Driver Under 25 Years Old	-0.09*	0.022	1.10
Driver Behavior Civil	-1.50*	0.036	4.48
Limited English Proficiency	0.54*	0.077	1.71
Vehicle Characteristics			
Pennsylvania Plate Registration	0.02	0.023	--
Passengers Present	0.75*	0.020	2.12
Situational Characteristics			
Daytime	-1.15*	0.018	3.15
Weekday (Mon-Thurs)	-0.35	0.017	1.42
Summer Months (June-August)	0.11	0.019	1.11
Interstate	-0.70*	0.022	1.32
PSP Member Characteristics			
Male Trooper	-0.28*	0.035	1.32
Non-White Trooper	-0.07	0.033	--
3 Years Less Experience	-0.12	0.020	1.13
Patrol Assignment	-0.25*	0.037	1.29
Trooper Rank	-1.30*	0.022	3.68
Nagelkerke R-Square	0.314		

NOTE: *p < 0.001 Only odds ratios for statistically significant estimates are presented. Odds Ratios for negative coefficients are calculated as 1/Exp(B), which equates to a value > 1.0, which we include as a negative odds ratio (-). This odds ratio can be interpreted as 'less likely' with the binary outcome.

Section Summary

This section summarizes the enforcement outcomes during PSP member-initiated traffic stops in 2024. The patterns and trends of traffic enforcement outcomes differed across PSP Areas, Troops, and Stations – these details are included in the Appendix. At the department level:

- 57.5% of stops resulted in warnings (13.7% verbal, 43.7% written)
- 56.8% of stops led to citations
- 3.7% of stops ended in arrests
- 4.5% of stops resulted in searches
- 2.2% of stops involved discretionary searches

BIVARIATE ANALYSIS

At the department level, substantively small bivariate differences were found across drivers' race/ethnicity and gender. These bivariate analyses do not control for alternative factors that could impact the relationship between stop outcomes and drivers' race/ethnicity or gender.

MULTIVARIATE ANALYSES

Building on the descriptive and bivariate statistics, Section 4 also presented results from binary multivariate logistic regression analyses of stop enforcement outcomes. The purpose of conducting these analyses is to better understand the influence of drivers' race/ethnicity and other factors on traffic stop outcomes. By incorporating multiple variables, multivariate models offer a more comprehensive interpretation of the influence on traffic stop outcomes of all factors measured by the PSP data collection system, including drivers' race/ethnicity. Table 4.7 below summarizes the findings from the multivariate statistical models and predicted probabilities.

- Legal factors such as the reasons for the stop, multiple violations, whether evidence is seized, and whether the driver has a criminal history are the strongest predictors of whether traffic stops lead to warnings, citations, arrests, and searches.
- PSP Troopers' race/ethnicity and gender are not substantively strong predictors of stop enforcement outcomes, though patrol assignment and rank demonstrated some influence.
- No substantive differences between White, Black, and Hispanic drivers are found for the odds of receiving warnings, citations, arrests, or searches once other explanatory factors are considered.
    - The predicted probability (or likelihood) of being warned is nearly equivalent for White and Black drivers (58.9% and 57.7%, respectively), and slightly lower for Hispanic drivers (52.6%)
    - The predicted probability of receiving a citation is very similar across White (58.0%), Black (57.0%), and Hispanic (60.9%) drivers

- The predicted probability of being arrested is rare and nearly equivalent across racial/ethnic groups, net of other factors (White 1.0%, Black 1.0%, Hispanic 1.1%).
- The predicted probability of being searched during a traffic stop is similar for White, Black, and Hispanic drivers after accounting for other measured factors (White = 1.8%; Black = 2.2%; Hispanic = 2.0%).

Table 4.7. Summary of Findings from Multivariate Analyses of Stop Outcomes

	Warnings	Citations	Arrests	Searches
Percent of Stops	**57.5%**	**56.8%**	**3.7%**	**4.5%**
Strongest Predictors	Evidence seized (-) Reason for stop Multiple reasons Civil behavior	Reason for stop Criminal History (-) Evidence seized Spec Traffic Enf Civil behavior (-)	Evidence seized Criminal history Reason for stop Multiple reasons Civil behavior (-)	Criminal history Reason for stop Multiple reasons Civil behavior (-) Passengers
Racial/Ethnic Differences (Odds Ratios)	No substantive differences between White, Black, and Hispanic drivers	No substantive differences between White, Black, and Hispanic drivers	No substantive differences between White, Black, and Hispanic drivers	No substantive differences between White, Black, and Hispanic drivers
Racial/Ethnic Differences (Predicted Probabilities)	Likelihood of *warning*: 58.9% White drivers 57.7% Black drivers 52.6% Hispanic drivers	Likelihood of *citation*: 58.0% White drivers 57.0% Black drivers 60.9% Hispanic drivers	Likelihood of *arrest*: 1.0% White drivers 1.0% Black drivers 1.1% Hispanic drivers	Likelihood of *search*: 1.8% White drivers 2.2% Black drivers 2.0% Hispanic drivers

Overall, these results indicate that all post-stop enforcement outcomes (warnings, citations, arrests, and searches) are primarily influenced by legal factors, with no substantive differences detected across racial/ethnic groups.

Finally, as noted in prior reports, multivariate analyses estimate the effects of drivers' race/ethnicity on post-stop outcomes by examining multiple factors simultaneously. However, these statistical models are limited by the type and quantity of data collected. The research team acknowledges the risk of model misspecification, where key unmeasured predictors cannot be included in the statistical models. Given the possibility of specification error, no analyses in this report – including the multivariate analyses – can conclusively determine if any reported racial/ethnic disparities are the result of bias or discrimination.

5. SEARCHES & SEIZURES

Section 5 details analyses that examine traffic stops with searches that result in seizures. Sometimes called a “search success rate” or “hit rate," these seizure rates represent the percentage of searches that result in seizure of contraband or other evidence of criminal activity. The seizure rates are analyzed at the Department, Area, and Troop levels, with further breakdowns by drivers’ race and ethnicity. Because many PSP Stations conduct a limited number of searches, station-level seizure tables are not included in the Appendix.

In 2024, PSP members conducted a total of 19,522 stops that resulted in searches. Out of these, 6,773 stops led to the seizure of contraband or other evidence of criminal activity. That is, 34.7% of traffic stops with searches conducted for any reason resulted in seizures of contraband or other evidence; this rate is nearly identical to the seizure rate reported in 2023 (34.3%).

As noted in Section 4, more than half of the searches in 2024 (51.5%) were conducted solely for mandatory reasons (i.e., incident to arrest or vehicle inventory). Of the mandatory searches conducted, only 11.2% resulted in seizures being made. Because PSP members have limited discretion over conducting these searches, the remainder of Section 5 will concentrate on the 9,468 searches (48.5% of all searches) that were conducted based on more discretionary reasons (i.e., reasonable suspicion/probable cause and consent). Discretionary searches are performed for the following reasons: Terry (officer safety), search warrant, plain view, probable cause plus exigency, and verbal or written consent.

Discretionary Searches Resulting in Seizures

Table 5.1 below shows that of the 9,468 discretionary searches performed in 2024, 5,643 resulted in contraband seizures, resulting in a discretionary search seizure rate of 59.6%. This is considerably higher than the seizure rates reported by many other agencies nationwide, which range from 18% to 40%) (Baumgartner et al., 2016; Missouri AGO, 2022; Texas DPS, 2023). Several agencies have observed a recent increase in overall seizure rates during searches, suggesting either an improvement in officers’ detection skills or a decreasing tendency among officers to conduct searches perceived as less likely to yield results.

Most common items seized are drugs and drug paraphernalia

The seizure rates for discretionary searches vary across PSP Areas, from a high of 68.1% of searches in Area I to a low of 55.8% in Area IV. Area IV has the second highest percentage of stops that result in a discretionary search, but the lowest seizure rate. Troop G has the highest percentage of discretionary searches resulting in seizures of evidence/contraband (81.3%), while Troop M has the lowest (47.1%).

Table 5.1 below also documents the types of evidence and/or contraband seized during PSP's discretionary searches. Note that a single search could produce multiple types of contraband or evidence of criminal activity that could be seized. Department-wide, when discretionary searches result in seizures, the most common types of contraband or evidence seized are drugs (51.7%) and drug paraphernalia (30.1%). The trends displayed at the department level are consistent across Areas and Troops, with few exceptions.

Table 5.1. Types of Evidence Seized by Department, Area, and Troop During Discretionary Searches (n=9,468)

	Total # of Discretionary Searches	% Disc. Searches w/ Seizure	# of Seizures	% Cash	% Drugs	% Vehicle	% Weapons	% Stolen Prop.	% Alcohol	% Drug-Paraphernalia	% Other
PSP Dept.	**9,468**	**59.6%**	**5,643**	**1.6%**	**51.7%**	**0.8%**	**4.0%**	**0.7%**	**0.9%**	**30.5%**	**2.1%**
AREA I	**2,724**	**68.1%**	**1,854**	**1.0%**	**58.9%**	**0.6%**	**3.5%**	**0.2%**	**1.1%**	**37.4%**	**3.2%**
Troop B	844	63.9%	539	1.3%	55.0%	0.5%	3.3%	0.2%	0.7%	31.6%	0.8%
Troop C	603	76.9%	464	0.8%	63.3%	0.7%	2.3%	0.3%	2.5%	46.1%	11.9%
Troop D	769	70.4%	541	0.7%	63.2%	0.3%	5.5%	0.0%	1.0%	39.0%	0.7%
Troop E	508	61.0%	310	1.0%	53.5%	1.0%	2.4%	0.2%	0.4%	34.4%	0.6%
AREA II	**2,180**	**62.4%**	**1,361**	**1.6%**	**54.4%**	**0.8%**	**3.2%**	**1.0%**	**1.1%**	**33.6%**	**1.5%**
Troop A	288	63.2%	182	2.1%	52.4%	0.0%	1.4%	0.3%	3.5%	33.3%	1.0%
Troop G	439	81.3%	357	0.5%	73.3%	0.7%	2.1%	0.7%	0.9%	38.7%	1.4%
Troop H	1,371	56.2%	770	1.9%	49.0%	0.9%	3.8%	1.2%	0.6%	32.4%	1.5%
Troop T	82	63.4%	52	1.2%	50.0%	2.4%	6.1%	1.2%	3.7%	28.0%	4.9%
AREA III	**1,435**	**61.4%**	**881**	**0.9%**	**54.5%**	**0.6%**	**3.6%**	**0.3%**	**0.7%**	**33.3%**	**1.2%**
Troop F	436	62.4%	272	1.6%	56.0%	0.2%	2.3%	0.5%	0.2%	36.9%	1.4%
Troop N	588	65.5%	385	0.9%	58.3%	0.3%	4.6%	0.2%	0.7%	32.0%	1.4%
Troop P	165	55.2%	91	0.6%	43.6%	3.6%	4.2%	0.6%	2.4%	33.9%	0.0%
Troop R	246	54.1%	133	0.0%	50.0%	0.0%	2.8%	0.0%	0.4%	29.7%	1.2%
AREA IV	**2,499**	**55.8%**	**1,394**	**1.8%**	**48.5%**	**1.2%**	**5.8%**	**1.1%**	**0.8%**	**24.8%**	**1.8%**
Troop J	850	68.6%	583	1.1%	61.6%	0.7%	4.7%	1.1%	0.6%	28.4%	2.0%
Troop K	673	48.0%	323	3.6%	37.4%	2.1%	10.8%	2.1%	0.7%	17.5%	2.1%
Troop L	475	53.1%	252	1.1%	48.2%	1.1%	4.0%	0.4%	1.1%	29.1%	1.3%
Troop M	501	47.1%	236	1.2%	41.3%	1.2%	2.6%	0.6%	0.8%	24.6%	1.8%

Table 5.2 below summarizes seizure rates for discretionary searches. It shows that searches conducted based on probable cause or reasonable suspicion yield a seizure rate of 65.2%, compared to a 57.0% seizure rate for searches based on consent. The table also presents the seizure rates for these two discretionary search categories at the Area level. Across all four Areas, searches based on probable cause or reasonable suspicion are more likely to result in the seizure of contraband than consent searches. Area I has the highest seizure rates for both types of discretionary searches (probable cause/reasonable suspicion seizure rate = 71.8%, consent searches = 66.4%).

Seizure Rates

All Searches	*34.7%*
Mandatory Searches	*11.2%*
Discretionary Searches	*59.6%*
Prob Cause/Reas Sup	65.2%
Consent	57.0%

Table 5.2. Seizure Rates by Search Type by Department and Area, 2024

	Seizure Rate for All Discretionary Searches	Seizure Rate for Prob Cause/Reas Susp Searches	Seizure Rate for Consent Searches
PSP Dept.	**59.6% (n=9,468)**	**65.2% (n=2,993)**	**57.0% (n=6,475)**
AREA I	68.1% (n=2,724)	71.8% (n=832)	66.4% (n=1,892)
AREA II	62.4% (n=2,180)	63.9% (n=728)	61.7% (n=1,452)
AREA III	61.4% (n=1,435)	66.0% (n=403)	59.6% (n=1,032)
AREA IV	55.8% (n=2,499)	60.0% (n=982)	53.1% (n=1,517)

Note: % = the percent of discretionary searches resulting in seizures, n = number of discretionary searches

Figure 5.1 compares the discretionary search seizure rates in 2024 to those in 2022 and 2023. **The overall discretionary search seizure rate rose from 55.6% in 2023 to 59.6% in 2024.** The seizure rate based on probable cause or reasonable suspicion also slightly rose to 65.2% from 64.4% in 2023, although both figures are still below the 74.0% rate recorded in 2022. Finally, the seizure rate for consent searches increased from 51.6% in 2023 to 57.0% in 2024.

Figure 5.1. Comparison of Discretionary Search Seizure Rates, 2022 – 2024

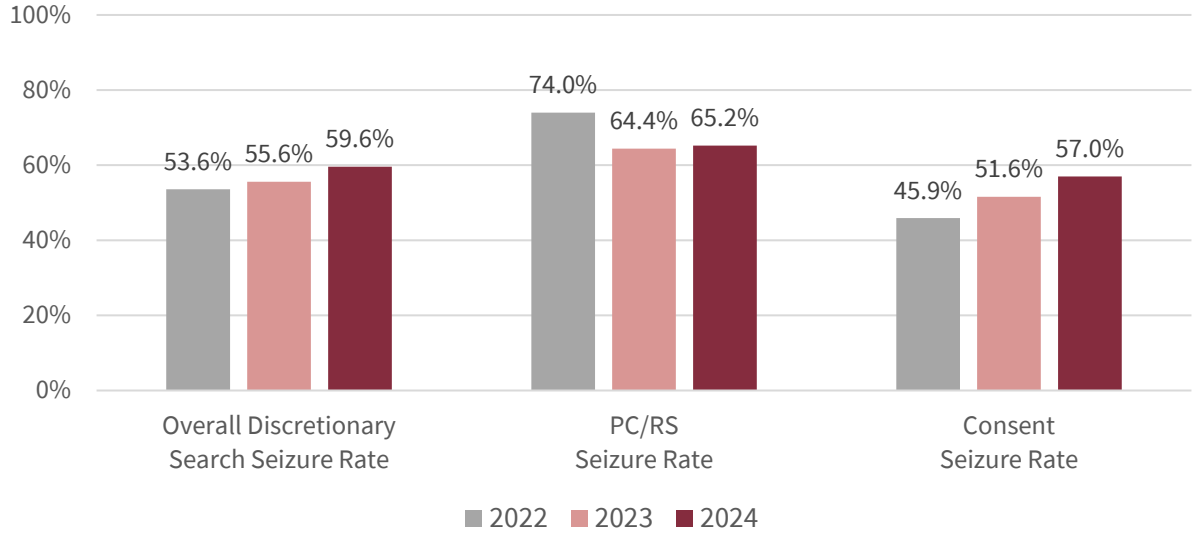


Table 5.3 displays the discretionary seizure rates at the Troop level. It indicates that most Troops exhibit higher seizure rates for probable cause/reasonable suspicion (PC/RS) searches (14 of 16 Troops) than searches conducted based on consent. The Troops with the *highest* PC/RS seizure rates include Troop C (78.6%), Troop J (76.1%), and Troop B (73.4%). Conversely, Troops with the *lowest* seizure rates in this category are Troop M (50.5%), Troop K (54.5%), and Troop L (55.0%).

For consent searches, Troop G (87.2%) and Troop C (75.9%) report the *highest* seizure rates, while Troop K (42.0%) and Troop M (45.0%) have the *lowest*.

Table 5.3. 2024 Seizure Rates for Discretionary Searches by Reasons for Search for Troops

	Seizure Rate for All Discretionary Searches	Seizure Rate for Prob Cause/ Reas Susp Searches	Seizure Rate for Consent Searches
AREA I			
Troop B	63.9% (n=844)	73.4% (n=241)	60.0% (n=603)
Troop C	76.9% (n=603)	78.6% (n=234)	75.9% (n=369)
Troop D	70.4% (n=769)	66.5% (n=194)	71.7% (n=575)
Troop E	61.0% (n=508)	65.6% (n=163)	58.8% (n=345)
AREA II			
Troop A	63.2% (n=288)	69.5% (n=118)	58.8% (n=170)
Troop G	81.3% (n=439)	66.9% (n=127)	87.2% (n=312)
Troop H	56.2% (n=1,371)	60.8% (n=441)	54.0% (n=930)
Troop T	63.4% (n=82)	71.4% (n=42)	55.0% (n=40)
AREA III			
Troop F	62.4% (n=436)	65.7% (n=102)	61.4% (n=334)
Troop N	65.5% (n=588)	68.7% (n=179)	64.1% (n=409)
Troop P	55.2% (n=165)	58.3% (n=72)	52.7% (n=93)
Troop R	54.1% (n=246)	68.0% (n=50)	50.5% (n=196)
AREA IV			
Troop J	68.6% (n=850)	76.1% (n=280)	64.9% (n=570)
Troop K	48.0% (n=673)	54.5% (n=321)	42.0% (n=352)
Troop L	53.1% (n=475)	55.0% (n=189)	51.7% (n=286)
Troop M	47.1% (n=501)	50.5% (n=192)	45.0% (n=309)

Note: % = the percent of discretionary searches resulting in seizures, n = number of discretionary searches

Seizure Rates and the Outcome Test

The presence of contraband or other evidence of criminal activity discovered during traffic stop searches is important to consider when considering racial and ethnic disparities in law enforcement activities. The outcome test is a statistical method employed to detect these disparities by comparing differences in seizure rates across racial/ethnic groups (see Knowles et al., 2001; Ayres, 2001). Section 2 provides a detailed explanation of this statistical technique.

An important fundamental assumption of the outcome test is that officers possess *full discretion* regarding the decision to conduct searches. Based on this criterion, the outcome test is only appropriate for analyzing traffic stops that lead to probable cause or reasonable suspicion searches; mandatory searches should be excluded, and consent searches present a greater level of complexity.[40] Although officers are the ones who initially determine whom to *ask for consent* to search, it is ultimately the motorists who decide whether or not to grant consent (Fridell, 2004; Engel, 2008). Therefore, consent searches violate one of the underlying assumptions of the outcome test that officers have full discretion when deciding who to search.

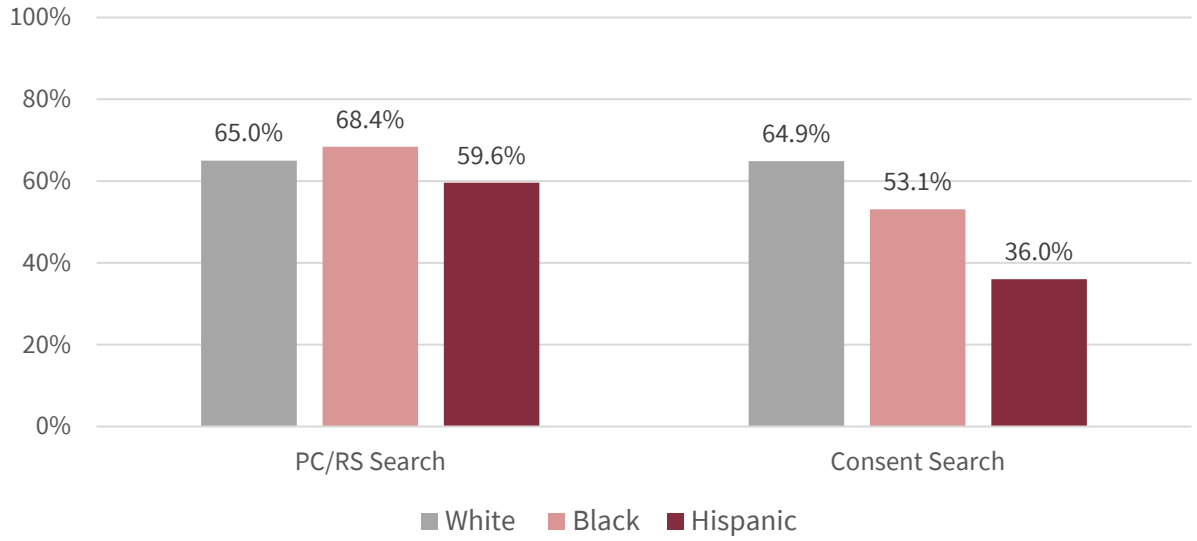
There are several additional limitations of the outcome test, based on other underlying assumptions that do not align with operational realities in policing (see Engel, 2008; Engel & Tillyer, 2008). Despite the inherent limitations of the outcome test, it can provide important information and serves as another method for assessing post-stop outcomes. Information related to the outcome test is provided to the PSP in an effort to support internal comparisons and enhance training within the PSP by offering additional insights regarding the effectiveness of consent searches. However, no conclusions can be drawn regarding trooper or organizational racial/ethnic bias or discrimination using these comparisons.

Figure 5.2 and Table 5.4 below display the seizure rates for discretionary searches conducted by PSP Troopers in 2024. The data reveals statistically significant differences in seizure rates for both types of discretionary searches across drivers' race and ethnicity, with the largest disparities for Hispanic compared to White motorists. According to the outcome test results across racial/ethnic groups, traffic stops with Black drivers searched for probable cause/reasonable suspicion have the *highest* likelihood of resulting in seizures (seizure rate = 68.4%), closely followed by White drivers with a seizure rate of 65.0%. In contrast, traffic stops with Hispanic drivers under similar search conditions are the *least* likely to result in the seizure of contraband or other evidence of criminal activity (seizure rate = 59.6%). This difference across racial/ethnic groups is considered substantively small, as evidenced by the Cramer's V statistic for effect sizes (Cramer's V value = 0.051).

[40] PSP Troopers rely heavily on consent searches due, in part, to Pennsylvania's unique case law on vehicular searches, which prohibits searches based on probable cause without a search warrant unless exigent circumstances exist (*Commonwealth v. Alexander*, 2020 Pa. LEXIS 6439). The Pennsylvania Supreme Court ruled that the Commonwealth's Constitution (Article I, Section 8) offers greater privacy protections to drivers than the Fourth Amendment of the U.S. Constitution. Troopers can, however, detain a vehicle while applying for a search warrant.

Statistically significant racial and ethnic differences are also evident for consent searches (p-value = <0.001). Traffic stops with Hispanic drivers who are searched based on consent are the least likely among the racial/ethnic groups to result in seizures of contraband or other evidence (seizure rate = 36.0%). By comparison, the seizure rate for consent searches during traffic stops of Black drivers is 53.1%, and 64.9% for White drivers. These differences in seizure rates during consent searches across racial/ethnic groups are considered substantively small based on the Cramer's V value (0.203).

Figure 5.2. Discretionary Search Seizure Rates by Drivers' Race/Ethnicity



Also as shown in Table 5.4, at the PSP Area level, patterns of racial and ethnic disparities in seizure rates are apparent but differ across Areas. First, for searches based on probable cause/reasonable suspicion, only Area IV shows small (as indicated by the Cramer's V statistic) racial/ethnic differences in seizure rates. Areas I, II, and III do not show any statistically significant differences. In Area IV, seizure rates for Black drivers are significantly *higher* than those for White and Hispanic drivers, with Hispanic drivers experiencing the *lowest* seizure rates.

In contrast, seizure rates for consent searches demonstrate more uniform and statistically significant disparities across racial and ethnic groups. Across all four Areas, seizure rates for consent searches of White drivers are significantly higher than for Black and Hispanic drivers. This reflects substantively small differences (as measured by the Cramer's V statistic) across all Areas. In Areas I, II, and IV, Hispanic drivers are the *least* likely to have contraband seized during consent searches, whereas in Area III, Black drivers are the *least* likely to have contraband seized.

Table 5.4: Discretionary Search Seizure Rates by Driver Race/Ethnicity

	Drivers	# of Prob Cause/ Reas Susp Searches	% Prob Cause/ Reas Susp Searches	# of Consent Searches	% Consent Searches
PSP Dept	White	1,826	65.0%*	3,666	64.9%***
	Black	817	68.4%	1,760	53.1%
	Hispanic	287	59.6%	849	36.0%
AREA I	White	652	70.4%	1,419	69.0%***
	Black	157	79.0%	382	62.3%
	Hispanic	15	66.7%	67	43.3%
AREA II	White	496	61.5%	775	68.6%***
	Black	169	69.8%	467	60.6%
	Hispanic	45	71.1%	161	37.9%
AREA III	White	253	66.4%	648	66.8%***
	Black	86	64.0%	209	42.1%
	Hispanic	50	68.0%	148	52.0%
AREA IV	White	412	59.7%*	676	58.7%***
	Black	384	64.1%	554	52.0%
	Hispanic	167	53.3%	258	41.9%

NOTE: *p < 0.05, **p <0 .01, ***p < 0.001

Unfortunately, the research team cannot further examine the relationship between drivers' race/ethnicity and seizures (like previous analyses conducted for other stop outcomes - warnings, citations, arrests, searches in Section 4) due to the limitations of the multivariate prediction model.[41] In short, the CDR data collection, like most traffic stop data collection systems, lacks effective measures of the factors that predict the likelihood of discovering contraband during discretionary searches.

Section Summary

In 2024, PSP Troopers made 19,522 traffic stops that resulted in searches, constituting 4.5% of all traffic stops initiated by members. Of these stops with searches:

- 51.5% were for only mandatory reasons (n=10,052 searches)
- 48.5% were for discretionary reasons (n=9,468 searches)
    - Of the 9,468 discretionary searches:
        - 31.6% were for probable cause / reasonable suspicion (n=2,993 searches)
        - 68.4% were for only consent (n=6,475 searches)

[41] The model predicting whether evidence or contraband was seized during discretionary searches is not provided due to several factors including: smaller sample size (n=9,468), the small Nagelkerke R-Square value (0.078), and the instability of the estimates within categories of situational and event characteristics. In short, the model is not robust, is slightly unstable, and does not provide a reliable foundation for estimation.

The percentage of searches that result in seizures of contraband or other evidence (seizure rates) across search reasons are:

- All Searches - 34.7%
- Mandatory Searches - 11.2%
- Discretionary Searches - 59.6%
    - Prob Cause / Reas Susp - 65.2%
    - Consent - 57.0%

These seizure rates are considerably higher than many agencies across the nation.

- Of the seizures made during discretionary searches, the most common types of contraband included drugs (51.7%) and drug paraphernalia (30.5%), followed distantly by weapons (4.0%).

Outcome tests are used to further examine racial/ethnic differences across seizure rates. These analyses show:

- Black drivers subjected to probable cause/reasonable suspicion searches show the *highest* likelihood of having contraband seized at 68.4%, closely followed by White drivers at 65.0%. Searched Hispanic motorists are *least* likely to be found in possession of contraband (59.6%); this difference is of small substantive magnitude.
- Seizure rates for consent searches indicate that Black and Hispanic motorists are *less* likely to be discovered with contraband compared to White drivers (53.1% and 36.0%, respectively, compared to 64.9% of White drivers). The differences across racial and ethnic groups are statistically significant but of small substantive magnitude.

6. CONCLUSION

This report presents the results from statistical analyses of data gathered from 433,599 member-initiated traffic stops conducted by the Pennsylvania State Police (PSP) from January 1 through December 31, 2024. A series of methodological and statistical analyses were conducted to identify patterns and trends across traffic stops and enforcement actions taken during these stops. Each section of this report and the Appendix documents these patterns and trends across the PSP Department, with additional details at the Area, Troop, and Station level.

Summary of Key Findings

Across dozens of statistical analyses, the following five major themes emerged:

(1) When examining the **reliability and validity of the data** collected during traffic stops, multiple analytical methods and statistical techniques demonstrate extremely high data quality and validity. The PSP has established a robust data collection system that is among the best in the country. The strength in this data collection effort bolsters confidence in the accuracy of the reported statistical findings and accountability systems.

(2) When considering the **initial decision to make a traffic stop**, multiple analytical methods and statistical techniques revealed no substantively significant differences across racial/ethnic groups. In short, the evidence available suggests no concerning patterns of racial/ethnic differences in member-initiated traffic stops made by the PSP.

(3) When examining **enforcement outcomes resulting from traffic stops**, a series of advanced analytical methods and statistical techniques (including binary logistic regression modeling and the calculation of predicted probabilities) showed no substantively significant differences in *any* warnings, citations, arrests, or searches across racial/ethnic groups. Rather, legal variables were the strongest predictors of the likelihood of PSP enforcement actions. In short, the evidence available suggests no consistent patterns of racial/ethnic differences in the enforcement outcomes of member-initiated traffic stops made by the PSP.

(4) When considering **seizures of contraband or other evidence of criminal behavior** during traffic stops involving searches, the PSP demonstrated high (and continually improving) seizure rates across different types of searches. In short, searches conducted by the PSP are highly effective, with the majority of searches conducted during member-initiated traffic stops resulting in seizures of contraband or other evidence of criminal activity.

(5) When comparing **seizure rates across different racial and ethnic groups**, only one type of search (consent) showed significant differences for one group (Hispanic drivers). While Hispanic drivers were *less* likely to have contraband or other evidence seized

during searches based on consent, the differences across racial/ethnic groups were substantively small and have continued to decrease over time. Additional training and accountability efforts already underway by the PSP should be continued.

The PSP's commitment to delivering professional and impartial policing services to Pennsylvania's residents and visitors is evident through their continuous data collection and analysis, as well as their responsiveness to the research team's previous recommendations. Given Act 18's mandates for traffic stop data collection, reporting, and public release of analyses, the PSP plans to continue to collect traffic stop data and have it independently analyzed. This continued data collection will further demonstrate PSP's steadfast commitment to transparency, accountability, and the provision of professional policing services.

This report indicates that racial/ethnic disparities in traffic stops and subsequent enforcement outcomes are rare within the PSP. Several factors likely contribute to this, including an increased scrutiny of traffic stops, enhanced training, strong organizational focus on equitable treatment, improved supervisory oversight in the field, and more dependable and accurate data on traffic stops. Collectively, the evidence available from this comprehensive examination of traffic stops suggests that the PSP is a national leader based on the high quality of their traffic stop data collection effort, continued reductions in racial/ethnic disparities in stops and post-stop enforcement actions, and high productivity in stops, searches, and contraband seizures. Continued data collection and independent analyses of these data will provide opportunities to track comparisons of traffic enforcement trends over time that will assist the PSP with their on-going commitment to continuous organizational improvement while enhancing public safety and building community trust.

REFERENCES

Allison, P.D. (1999). *Multiple Regression: A Primer*. Thousand Oaks, CA: Sage Publications.

Alpert, G. P., Dunham, R. G., & Smith, M. R. (2007). Investigating racial profiling by the Miami-Dade Police Department: A multimethod approach. *Criminology & Public Policy*, *6*(1), 25-55.

Alpert, G.P., Smith, M.R., & Dunham, R. (2004a). Toward a better benchmark: Assessing the utility of not-at-fault traffic crash data in racial profiling research. *Justice Research and Policy, 6,* 43-69.

Alpert, G.P., Smith, M.R., Dunham, R., & Piquero, A., & Parker, K. (2004b). *Miami-Dade Police Department racial profiling study*. Columbia, SC: Alpert Group.

Anwar, S., & Fang, H. (2006). An alternative test of racial prejudice in motor vehicle searches: Theory and evidence. *American Economic Review*, 127-151.

Ayres, I. (2001). *Pervasive Prejudice? Unconventional Evidence of Racial and Gender Discrimination.* Chicago: The University of Chicago Press.

Baumgartner, F. R., Epp, D. A., Shoub, K., & Love, B. (2016). Targeting young men of color for search and arrest during traffic stops: Evidence from North Carolina, 2002-2013. *Politics, Groups, and Identities*, 1-25.

Benjamin, D., & Berger, J. (2019). Three recommendations for improving the use of p-values. *The American Statistician, 73*, 186-191.

Betensky, R. (2019). The p-Value Requires Context, Not a Threshold. *The American Statistician*, 73(1), 115-117. DOI: 10.1080/00031305.2018.1529624

Boehme, H. M., & Mourtgos, S. M. (2024). The effect of formal de-policing on police traffic stop behavior and crime: Early evidence from LAPD's policy to restrict discretionary traffic stops. *Criminology & Public Policy*, *23*(3), 517-542.

Briggs, S. J., & Keimig, K. A. (2017). The impact of police deployment on racial disparities in discretionary searches. *Race and Justice*, *7*(3), 256-275.

Chanin, J., Welsh, M., & Nurge, D. (2018). Traffic enforcement through the lens of race: A sequential analysis of post-stop outcomes in San Diego, California. *Criminal Justice Policy Review*, *29*(6-7), 561-583.

Chavez, N. (2021, August 15). *Multiracial population grew in almost every county in the US. It doesn't mean racism is over*. CNN. https://www.cnn.com/2021/08/15/us/census-2020-multiracial-nation/index.html

Chen, H., Cohen, P., & Chen, S. (2010). How big is a big odds ratio? Interpreting the magnitudes of odds ratios in epidemiological studies. *Communications in Statistics—simulation and Computation, 39*(4), 860-864.

Cherkauskas, J. M. C. (2011). The Role of driving behavior in the debate over racially biased policing. [Doctoral dissertation, The Pennsylvania State University].

Ciavaglia, J. (2025, May 13). *PA toughens up cellphone, texting while driving law. Why you can get pulled over now.* Phillyburbs.com. Retrieved May 21, 2025, from https://www.phillyburbs.com/story/news/local/2025/05/13/pa-law-no-cellphone-in-hand-while-driving-distracted-driving-texting-paul-miller-law-fines/83578159007/

Cohen J. (1988). *Statistical power and analysis for the behavioral sciences, 2nd ed*. Hisdale, NJ: Lawrence Erlbaum Associates.

Commonwealth of Pennsylvania (2024, June 5). *Governor Shapiro Signs "Paul Miller's Law," Banning the Use of Hand-Held Devices While Driving and Increasing Transparency and Accountability at Traffic Stops.* Commonwealth of Pennsylvania Governor's Newsroom. Retrieved May 21, 2025, from https://www.pa.gov/governor/newsroom/2024-press-releases/governor-shapiro-signs--paul-miller-s-law---banning-the-use-of-h.html

Dias, M., Epp, D. A., Roman, M., & Walker, H. L. (2024). Consent searches: Evaluating the usefulness of a common and highly discretionary police practice. *Journal of Empirical Legal Studies*, *21*(1), 35-91.

Engel, R.S. (2008). A critique of the "outcome test" in racial profiling research. *Justice Quarterly, 25*(1), 1-36.

Engel, R.S., Calnon, J.M., Tillyer, R., Johnson, R., Liu, L., & Wang, X. (2005). *Project on Police-Citizen Contacts: Year 2 Final Report.* Submitted to the Pennsylvania State Police Department, Harrisburg, PA.

Engel, R., & Calnon, J. (2004a). Comparing Benchmark Methodologies for Police-Citizen Contacts: Traffic Stop Data Collection for the Pennsylvania State Police. *Police Quarterly, 7*(1), 97-125.

Engel, R.S. & Calnon, J.M. (2004b). Examining the influence of race during traffic stops with police: Results from a national survey. *Justice Quarterly, 21*, 49-90.

Engel, R.S. & Cherkauskas, J. (2022). *2021 Pennsylvania State Police Traffic Stop Study: January 1 – December 31, 2021*. Report submitted to the Commissioner of the Pennsylvania State Police. https://www.pa.gov/content/dam/copapwp-pagov/en/psp/documents/cdr/CDR_2021.pdf

Engel, R.S. & Cherkauskas, J.C. (2011). Project on Police-Citizen Contacts: Final Report, 2009. Submitted to the Pennsylvania State Police, Office of the Commissioner, Harrisburg, PA.

Engel, R.S., Cherkauskas, J.C., Corsaro, N., & Zidar, M. (2024). 2023 Pennsylvania State Police Traffic Stop Study: January 1 – December 31, 2022. Report submitted to the Commissioner of the Pennsylvania State Police. https://www.pa.gov/content/dam/copapwp-pagov/en/psp/documents/cdr/cdr_2023.pdf

Engel, R.S., Cherkauskas, J.C., Corsaro, N., & Yildirim, M. (2023). *2022 Pennsylvania State Police Traffic Stop Study: January 1 – December 31, 2022*. Report submitted to the Commissioner of the Pennsylvania State Police. https://www.pa.gov/content/dam/copapwp-pagov/en/psp/documents/cdr/CDR_2022.pdf

Engel, R.S., Cherkauskas, J.C., & Tillyer, R. (2011). *Project on Police-Citizen Contacts: Final Report, 2008.* Submitted to the Pennsylvania State Police, Office of the Commissioner, Harrisburg, PA.

Engel, R.S., Tillyer, R., & Cherkauskas, J.C. (2008). *Project on Police-Citizen Contacts: Final Report, 2006*. Submitted to the Pennsylvania State Police Department, Harrisburg, PA.

Engel, R. S., & Swartz, K. (2014). Race, crime, and policing. *The Oxford handbook of ethnicity, crime, and immigration*, 135-165.

Engel, R.S. & Tillyer, R. (2008). Searching for equilibrium: The tenuous nature of the outcome test. *Justice Quarterly, 25*(1), 54-71.

Engel, R.S. & Tillyer, R., Stoddard, C., & Johnson, R. (2007). *Project on Police-Citizen Contacts: Final Report, Years 2004 – 2005.* Submitted to the Pennsylvania State Police.

Fliss, M. D., Baumgartner, F., Delamater, P., Marshall, S., Poole, C., & Robinson, W. (2020). Re-prioritizing traffic stops to reduce motor vehicle crash outcomes and racial disparities. *Injury Epidemiology*, *7*(1), 3.

Fridell, L. (2004). *By the Numbers: A Guide for Analyzing Race Data from Vehicle Stops.* Washington, D.C.: Police Executive Research Forum.

Fridell, L., Lunney, R., Diamond, D. & Kubu, B. (2001). *Racially Biased Policing: A Principled Response.* Washington, D.C.: Police Executive Research Forum.

Goodman, S. N. (2008). A dirty dozen: Twelve P-value misconceptions. *Seminars in Hematology, 45*, 135-140.

Greenland, S., Senn, S. J., Rothman, K. J., Carlin, J. B., Poole, C., Goodman, S. N., & Altman, D. G. (2016). Statistical tests, P values, confidence intervals, and power: A guide to misinterpretations. *European Journal of Epidemiology, 31* (4), 337-350.

Grogger, J., & Ridgeway, G. (2006). Testing for Racial Profiling in Traffic Stops From Behind a Veil of Darkness. *Journal of the American Statistical Association*, *101*(475), 878–887.

Hanushek, E. A., & Jackson, J. E. (1977). *Statistical methods for social scientists*. Orlando, FL: Academic Press.

Holder, S. (2023, February 2). These cities are limiting traffic stops for minor offenses. *Bloomberg (Online).* https://www.bloomberg.com/news/articles/2023-02-02/police-traffic-stops-face-new-scrutiny-after-tyre-nichols-death

Jung, J., Corbett-Davies, S., Shroff, R., & Goel, S. (2018). Omitted and included variable bias in tests for disparate impact. *arXiv preprint arXiv:1809.05651*.

Knode, J. L., Wolfe, S. E., & Carter, T. M. (2024). Pulling back the veil of darkness: A proposed road map to disentangle racial disparities in traffic stops, a research note. *Criminology*, *62*(2), 364–375. https://doi.org/10.1111/1745-9125.12366

Knowles, J., Persico, N., & Todd, P. (2001). Racial bias in motor vehicle searches: Theory and evidence. *The Journal of Political Economy*, *109*, 203-229.

Lange , J. E. , Blackman , K. B., & Johnson , M. E. (2001). *Speed survey of the New Jersey Turnpike: Final report* , Calverton, MD : Public Services Research Institute .

Lange, J. E., Johnson, M. B., & Voas, R. B. (2005). Testing the racial profiling hypothesis for seemingly disparate traffic stops on the New Jersey Turnpike. *Justice Quarterly, 22*(2), 193-223.

Liao, T.F. (1994). *Interpreting Probability Models: Logit, Probit, and Other Generalized Linear Models.* Thousand Oaks, CA: Sage.

Lin, M., Lucas, H., & Shmueli, G. (2013). Too big to fail: large samples and the p-value problem. *2 Information Systems Research*.

Loken, E., & Gelman, A. (2017). Measurement error and the replication crisis. *Science, 355* (6325), 584-585.

Long J. S. (1997). Regression models for categorical and limited dependent variables. *Sage Advanced Quantitative Techniques in the Social Sciences Series*. Vol. 7. Thousand Oaks, CA: Sage.

Lovrich, N.P., Gaffney, M.J., Mosher, C.C., & Pratt, T.C. (2007). *Results of the monitoring of WSP traffic stops for biased policing.* Washington State University.

Marvell, T. B., & Moody, C. E. (1996). Specification problems, police levels, and crime rates. *Criminology*, *34*(4), 609-646.

Mears, D. P., Cochran, J. C., & Lindsey, A. M. (2016). Offending and racial and ethnic disparities in criminal justice: A conceptual framework for guiding theory and research and informing policy. *Journal of Contemporary Criminal Justice*, *32*(1), 78-103.

Meyers, L. S., Gamst, G., & Guarino, A. J. (2016). *Applied multivariate research: Design and interpretation.* Sage Publications.

Missouri Attorney General's Office (2022). *Missouri Vehicle Stops 2021 Annual Report*. https://ago.mo.gov/docs/default-source/vsr/2021-vsr/2021-vsr-final/2021-vehicle-stops-annual-report.pdf?sfvrsn=8c6dbdcf_2.

Muijs, Daniel. Advanced quantitative data analysis. In *Research Methods Educational Leadership and Management* (Briggs, A., Coleman, M., & Morrison, M., Eds). Sage Publications, pp: 363-380.

PAtrooper.com. (n.d.). *Duties of a Trooper.* Retrieved July 31, 2024 from: https://www.patrooper.com/duties-of-a-trooper.html

Pennsylvania State Data Center. (2022). *2020 Census Redistricting Data: Racial and Ethnic Diversity in Pennsylvania.* Retrieved July 31, 2024 from: https://pasdc.hbg.psu.edu/sdc/pasdc_files/researchbriefs/January_2022.pdf

PSP (n.d.). *State Police.* Retrieved July 31, 2024 from https://www.pa.gov/en/agencies/psp.html

Pryor, M., Goff, P.A., Heydari, F., & Friedman, B. (2020). *Collecting, Analyzing, and Responding to Stop Data: A Guidebook for Law Enforcement Agencies, Government, and Communities*. https://policingequity.org/images/pdfs-doc/COPS-Guidebook_Final_Release_Version_2-compressed.pdf.

Ramirez, D., McDevitt, J., & Farrell, A. (2000). *A resource guide on racial profiling data collection systems: Promising practices and lessons learned*. Washington, DC: U.S. Department of Justice.

Ratcliffe, J. H., & Hyland, S. S. (2025). Police stops and naïve denominators. *Crime Science, 14*(1), 10.

Raudenbush, S.W. & Bryk, A.S. (2002). *Hierarchical Linear Models, 2nd Edition.* Newbury Park, CA: Sage.

Ridgeway, G., & MacDonald, J. (2010). Methods for assessing racially biased policing. *Race, ethnicity, and policing: New and essential readings*, 180-204.

RIPA Board. (2023). *Annual Report 2022.* Retrieved July 31, 2024 from: https://oag.ca.gov/system/files/media/ripa-board-report-2022.pdf

RIPA Board. (2022). *Annual Report 2021.* Retrieved July 31, 2024 from: https://oag.ca.gov/sites/all/files/agweb/pdfs/ripa/ripa-board-report-2021.pdf

RIPA Board. (2021). *Annual Report 2020.* Retrieved July 31, 2024 from: https://oag.ca.gov/sites/all/files/agweb/pdfs/ripa/ripa-board-report-2020.pdf

Rojek, J., Rosenfeld, R., & Decker, S. (2012). Policing race: The racial stratification of searches in police traffic stops. *Criminology*, *50*(4), 993-1024.

Rosenfeld, R., Rojek, J., & Decker, S. (2012). Age matters: Race differences in police searches of young and older male drivers. *Journal of Research in Crime and Delinquency*, *49*(1), 31-55.

Ross, M.B. & Barone, K. (2024). *Traffic stop data analysis and findings, 2022*. UConn Institute for Municipal and Regional Policy. www.ctrp3.org

Sampson, R. J., & Lauritsen, J. L. (1997). Racial and ethnic disparities in crime and criminal justice in the United States. *Crime and Justice*, *21*, 311-374.

Sanders, C., Hoard, S., Makin, D., Gaffney, M. J. & Anderson, B. (2022). *Report to the Washington State Patrol*. Washington State University, Division of Governmental Studies and Services, https://www.wsp.wa.gov/wp-content/uploads/2022/02/WSP-Bias-Traffic-Stop-Study_2021.pdf

Schafer, J. A., Carter, D. L., Katz-Bannister, A. J., & Wells, W. M. (2006). Decision making in traffic stop encounters: A multivariate analysis of police behavior. *Police Quarterly*, *9*(2), 184-209.

Schafer, J. A., & Mastrofski, S. D. (2005). Police leniency in traffic enforcement encounters: Exploratory findings from observations and interviews. *Journal of Criminal Justice*, *33*(3), 225–238.

Seguino, S., Brooks, N. & Autilio, P. (2020). *Trends in Racial Disparities in Traffic Stops: Vermont State Police, 2010-19*. The University of Vermont.

Sheskin, D. (2011). *Handbook of Parametric and Nonparametric Statistical Procedures*. Boca Raton, FL: Chapman & Hall/CRC.

Singleton, R.A. & Straits, B.C. (2005). *Approaches to social research* (6th ed), Oxford University Press.

Smith, M. R., Tillyer, R., Lloyd, C., & Petrocelli, M. (2021). Benchmarking disparities in police stops: A comparative application of 2nd and 3rd generation techniques. *Justice Quarterly*, *38*(3), 513-536.

Smith, S. K., & DeFrances, C. J. (2003). *Assessing measurement techniques for identifying race, ethnicity, and gender: Observation-based data collection in airports and at immigration checkpoints.* Washington, D.C.: U.S. Department of Justice.

Tapp, S. N., & Davis, E. J. (2022). *Contacts Between Police and the Public, 2020*. Retrieved on July 15, 2024 from: https://bjs.ojp.gov/media/document/cbpp20.pdf

Texas Department of Public Safety (2023). *2022 Motor Vehicle Stop Data Report*. https://www.dps.texas.gov/sites/default/files/documents/director_staff/public_information/2022_traffic_stop_data_report.pdf.

Tillyer, R., Engel, R. S., & Cherkauskas, J. C. (2010). Best practices in vehicle stop data collection and analysis. *Policing: An International Journal of Police Strategies & Management*, *33*(1), 69-92.

Tillyer, R., & Engel, R. S. (2012). Racial differences in speeding patterns: Exploring the differential offending hypothesis. *Journal of Criminal Justice*, *40*(4), 285-295.

Tillyer, R., & Engel, R. S. (2013). The impact of drivers' race, gender, and age during traffic stops: Assessing interaction terms and the social conditioning model. *Crime & Delinquency*, *59*(3), 369-395.

Tillyer, R., & Klahm IV, C. F. (2015). Discretionary searches, the impact of passengers, and the implications for police–minority encounters. *Criminal Justice Review*, *40*(3), 378-396.

Tillyer, R., Klahm IV, C. F., & Engel, R. S. (2012). The discretion to search: A multilevel examination of driver demographics and officer characteristics. *Journal of Contemporary Criminal Justice*, *28*(2), 184-205.

Tillyer, R., Smith, M., & Lloyd, C. D. (2019). Another piece of the puzzle: The importance of officer characteristics and group processes in understanding post-stop outcomes. *Journal of Research in Crime and Delinquency*, *56*(5), 736-779.

United States Census Bureau. (2023). *QuickFacts: Pennsylvania.* Retrieved July 31, 2024 from https://www.census.gov/quickfacts/PA.

Wasserstein, R. L., & Lazar, N. A. (2016). The ASA statement on p-values: Context, process, and purpose. *The American Statistician, 70*, 129-133.

Whren v. United States, 517 U.S. 806 (1996).

Withrow, B.L., & Williams, H. (2015). Proposing a benchmark based on vehicle collision data in racial profiling research. *Criminal Justice Review, 40*(4), 449-469.

Witte, R. S., & Witte, J. S. (2015). *Statistics*. John Wiley & Sons.

Wolfe, S. E., Carter, T., & Knode, J. (2021). *Michigan State Police Traffic Stop External Benchmarking: A Final Report on Racial and Ethnic Disparities*. East Lansing, MI: School of Criminal Justice, Michigan State University.

Vito, A. G., Grossi, E. L., Woodward Griffin, V., & Higgins, G. E. (2019). Consent searches: understanding the role of race and what occurs during the traffic stop. *Policing: An International Journal*, *42*(4), 611-623.

APPENDIX

To streamline the annual report, station-level tables are presented here by their corresponding section of the main report.

Section 2 Supplemental Tables: pages 81-86

Section 3 Supplemental Tables: pages 87-107

Section 4 Supplemental Tables: pages 108-127

Table A.1. Comparison of Number of Stops in CDR and CAD Data Sets for Areas I & II, 2024

	Traffic Stops in CDR	Traffic Stops in CAD	Percent Difference
Troop B			
Belle Vernon	4,892	4,995	-2.1%
Pittsburgh	6,309	6,559	-3.8%
Uniontown	8,157	8,299	-1.7%
Washington	5,466	5,414	1.0%
Waynesburg	2,151	2,196	-2.0%
Troop C			
Clarion	4,121	4,107	0.3%
Clearfield	5,046	5,035	0.2%
Dubois	3,582	3,598	-0.4%
Lewis Run	4,638	4,635	0.1%
Marienville	3,821	3,791	0.8%
Punxsutawney	3,082	3,077	0.2%
Ridgway	3,283	3,271	0.4%
Troop D			
Beaver	3,701	3,736	-0.9%
Butler	5,081	5,079	0.0%
Kittanning	6,272	6,301	-0.5%
Mercer	3,419	3,448	-0.8%
New Castle	2,094	2,125	-1.5%
Troop E			
Corry	2,311	2,320	-0.4%
Erie	7,631	7,696	-0.8%
Franklin	2,241	2,270	-1.3%
Girard	7,439	7,438	0.0%
Meadville	3,419	3,453	-1.0%
Warren	2,637	2,634	0.1%
Troop A			
Ebensburg	2,343	2,206	6.2%
Greensburg	6,057	6,147	-1.5%
Indiana	4,649	4,607	0.9%
Kiski Valley	1,886	1,919	-1.7%
Somerset (A)	2,706	2,699	0.3%
Troop G			
Bedford	4,970	5,029	-1.2%
Hollidaysburg	3,142	3,153	-0.3%
Huntingdon	4,018	4,095	-1.9%
Lewistown	5,009	5,035	-0.5%
McConnellsburg	2,630	2,660	-1.1%
Rockview	6,683	6,759	-1.1%
Troop H			
Carlisle	11,472	10,935	4.9%
Chambersburg	11,400	11,367	0.3%
Gettysburg	10,309	10,313	0.0%
Harrisburg	9,286	9,278	0.1%
Lykens	3,715	3,736	-0.6%
Newport	3,728	3,767	-1.0%
Troop T			
Bowmansville	4,850	5,017	-3.3%
Everett	5,388	5,399	-0.2%
Gibsonia	5,878	6,026	-2.5%
Highspire	79	84	-6.0%
Jefferson Hills	4,736	4,648	1.9%
King of Prussia	5,722	5,864	-2.4%
New Stanton	4,414	4,553	-3.1%
Newville	5,797	5,965	-2.8%
Pocono	5,395	5,524	-2.3%

Somerset (T)	4,314	4,424	-2.5%

Table A.1. Comparison of Number of Stops in CDR and CAD Data Sets for Areas III & IV, 2024

	Traffic Stops in CDR	Traffic Stops in CAD	Percent Difference
Troop F			
Coudersport	4,696	4,805	-2.3%
Emporium	1,043	1,049	-0.6%
Lamar	3,901	3,908	-0.2%
Mansfield	3,348	3,365	-0.5%
Milton	6,786	6,845	-0.9%
Montoursville	6,099	6,334	-3.7%
Selinsgrove	3,964	3,946	0.5%
Stonington	2,614	2,593	0.8%
Troop N			
Bloomsburg	2,779	2,828	-1.7%
Fern Ridge	3,275	3,366	-2.7%
Hazleton	6,950	6,986	-0.5%
Lehighton	3,277	3,244	1.0%
Stroudsburg	8,848	8,908	-0.7%
Troop P			
Laporte	1,647	1,713	-3.9%
Shickshinny	1,401	1,398	0.2%
Towanda	3,184	3,254	-2.2%
Tunkhannock	2,069	2,096	-1.3%
Wilkes-Barre	4,154	4,047	2.6%
Troop R			
Blooming Grove	3,188	3,229	-1.3%
Dunmore	3,756	3,800	-1.2%
Gibson	1,774	1,770	0.2%
Honesdale	2,053	2,070	-0.8%
Troop J			
Avondale	8,289	8,346	-0.7%
Embreeville	7,489	7,634	-1.9%
Lancaster	10,528	10,725	-1.8%
York	11,559	12,052	-4.1%
Troop K			
Media	12,255	12,327	-0.6%
Philadelphia	8,430	8,465	-0.4%
Skippack	3,528	3,542	-0.4%
Troop L			
Frackville	3,872	3,867	0.1%
Hamburg	2,423	2,426	-0.1%
Jonestown	4,806	4,790	0.3%
Reading	5,599	5,621	-0.4%
Schuylkill Haven	4,307	4,229	1.8%
Troop M			
Belfast	2,646	2,652	-0.2%
Bethlehem	6,917	6,960	-0.6%
Dublin	3,043	3,088	-1.5%
Fogelsville	6,488	6,613	-1.9%
Trevose	3,250	3,221	0.9%
Specialized Units			
SHIELD	3,966	3,930	-0.9%
Canine	1,285	1,242	-3.3%

Table A.2 Area I Percent Unknown Race/Ethnicity of Drivers Stopped by Station, Comparisons Between 2022, 2023, and 2024

	UNKNOWN RACE					UNKNOWN ETHNICITY				
	1/1/22-8/11/22	8/12/22-12/31/22	2023	2024	Diff btw 2023 & 2024	1/1/22-8/11/22	8/12/22-12/31/22	2023	2024	Diff btw 2023 & 2024
Troop B	**6.0%**	**4.5%**	**4.1%**	**5.3%**	**1.2%**	**9.0%**	**6.3%**	**6.7%**	**7.9%**	**1.2%**
Belle Vernon	7.8%	9.6%	10.3%	11.0	**0.7%**	11.6%	12.2%	11.9%	11.2%	**-0.7%**
Pittsburgh	4.7%	3.2%	4.7%	11.6	**6.9%**	14.5%	10.1%	16.0%	22.9%	**6.9%**
Uniontown	5.6%	3.8%	1.6%	0.6%	**-1.0%**	5.2%	3.5%	1.6%	0.6%	**-1.0%**
Washington	6.8%	2.8%	2.1%	1.1%	**-1.0%**	6.7%	2.5%	0.9%	0.9%	**0.0%**
Waynesburg	7.5%	3.8%	1.9%	1.9%	**0.0%**	8.2%	4.1%	2.2%	2.1%	**-0.1%**
Troop C	**7.2%**	**3.9%**	**2.3%**	**2.8%**	**0.5%**	**6.9%**	**3.6%**	**1.7%**	**2.3%**	**0.6%**
Clarion	7.5%	2.5%	3.4%	2.8%	**-0.6%**	6.2%	2.9%	3.1%	2.8%	**-0.3%**
Clearfield	6.4%	4.8%	4.1%	4.7%	**0.6%**	6.7%	4.4%	3.9%	4.3%	**0.4%**
Dubois	14.4%	6.8%	2.9%	4.1%	**1.2%**	13.5%	5.3%	1.3%	2.5%	**1.2%**
Lewis Run	3.6%	5.6%	2.1%	2.7%	**0.6%**	2.8%	5.0%	1.6%	2.6%	**1.0%**
Marienville	3.1%	0.7%	0.4%	1.1%	**0.7%**	3.9%	0.6%	0.1%	0.5%	**0.4%**
Punxsutawney	0.5%	0.2%	0.3%	0.3%	**0.0%**	0.3%	0.2%	0.1%	0.1%	**0.0%**
Ridgway	15.5%	6.6%	2.9%	3.2%	**0.3%**	15.3%	7.0%	1.5%	2.1%	**0.6%**
Troop D	**5.4%**	**2.1%**	**2.2%**	**2.5%**	**0.3%**	**5.7%**	**3.1%**	**3.4%**	**2.9%**	**-0.5%**
Beaver	6.6%	2.3%	3.8%	2.0%	**-1.8%**	8.1%	8.7%	8.4%	4.7%	**-3.7%**
Butler	8.7%	2.7%	1.7%	2.8%	**1.1%**	9.0%	3.2%	4.1%	2.9%	**-1.2%**
Kittanning	1.3%	0.9%	2.2%	3.0%	**0.8%**	1.1%	0.8%	2.0%	3.0%	**1.0%**
Mercer	9.8%	4.2%	2.7%	2.8%	**0.1%**	10.3%	3.9%	2.5%	2.3%	**-0.2%**
New Castle	2.2%	1.6%	0.7%	1.0%	**0.3%**	2.4%	1.4%	0.7%	0.4%	**-0.3%**
Troop E	**2.7%**	**1.0%**	**0.9%**	**1.0%**	**0.1%**	**3.6%**	**1.0%**	**0.9%**	**0.9%**	**0.0%**
Corry	0.4%	0.1%	0.4%	0.3%	**-0.1%**	0.3%	0.5%	0.5%	0.2%	**-0.3%**
Erie	1.7%	0.6%	0.5%	1.1%	**0.6%**	2.0%	0.7%	0.6%	0.9%	**0.3%**
Franklin	10.7%	1.7%	1.6%	1.5%	**-0.1%**	18.5%	2.5%	2.0%	1.2%	**-0.8%**
Girard	2.2%	1.8%	1.0%	0.9%	**-0.1%**	2.3%	1.5%	0.9%	0.6%	**-0.3%**
Meadville	4.5%	1.7%	1.4%	1.4%	**0.0%**	4.7%	1.1%	1.1%	1.2%	**0.1%**
Warren	1.0%	0.6%	0.6%	0.8%	**0.2%**	1.5%	0.8%	0.7%	0.7%	**0.0%**

Table A.2. Area II Percent Unknown Race/Ethnicity of Drivers Stopped by Station, Comparisons Between 2022, 2023, and 2024

	UNKNOWN RACE					UNKNOWN ETHNICITY				
	1/1/22-8/11/22	8/12/22-12/31/22	2023	2024	Diff btw 2023 & 2024	1/1/22-8/11/22	8/12/22-12/31/22	2023	2024	Diff btw 2023 & 2024
Troop A	**1.9%**	**0.8%**	**1.2%**	**0.8%**	**-0.4%**	**2.9%**	**0.8%**	**1.1%**	**0.8%**	**-0.3%**
Ebensburg	9.0%	1.8%	1.2%	1.5%	**0.3%**	9.5%	1.9%	1.9%	1.7%	**-0.2%**
Greensburg	0.6%	0.7%	0.8%	0.7%	**-0.1%**	0.6%	0.5%	0.6%	0.5%	**-0.1%**
Indiana	1.7%	0.6%	1.8%	0.6%	**-1.2%**	3.8%	0.7%	1.1%	0.6%	**-0.5%**
Kiski Valley	0.7%	0.9%	1.2%	0.9%	**-0.3%**	0.7%	0.9%	0.7%	0.6%	**-0.1%**
Somerset (A)	0.9%	0.8%	1.1%	0.9%	**-0.2%**	1.0%	0.8%	1.3%	0.9%	**-0.4%**
Troop G	**4.5%**	**3.1%**	**2.2%**	**1.8%**	**-0.4%**	**4.6%**	**2.9%**	**1.9%**	**1.7%**	**-0.2%**
Bedford	1.8%	0.8%	0.9%	1.3%	**0.4%**	1.8%	0.7%	0.7%	1.1%	**0.4%**
Hollidaysburg	4.0%	7.3%	3.7%	1.1%	**-2.6%**	4.0%	7.3%	3.5%	1.4%	**-2.1%**
Huntingdon	7.1%	4.7%	5.2%	5.8%	**0.6%**	7.1%	4.4%	4.9%	5.6%	**0.7%**
Lewistown	2.4%	0.5%	0.8%	0.6%	**-0.2%**	2.5%	0.6%	0.7%	0.4%	**-0.3%**
McConnellsburg	10.6%	5.3%	2.5%	2.3%	**-0.2%**	10.9%	4.8%	1.6%	1.5%	**-0.1%**
Rockview	3.7%	1.6%	1.0%	1.0%	**0.0%**	3.9%	1.3%	0.9%	0.9%	**0.0%**
Troop H	**3.6%**	**1.7%**	**1.0%**	**1.2%**	**0.2%**	**3.9%**	**1.6%**	**0.9%**	**1.0%**	**0.1%**
Carlisle	2.4%	1.7%	1.2%	0.9%	**-0.3%**	2.8%	1.6%	0.8%	0.4%	**-0.4%**
Chambersburg	2.2%	1.1%	0.5%	0.8%	**0.3%**	3.0%	1.0%	0.5%	0.8%	**0.3%**
Gettysburg	1.9%	0.8%	0.7%	0.8%	**0.1%**	1.7%	0.5%	0.6%	0.6%	**0.0%**
Harrisburg	9.1%	4.7%	2.0%	2.4%	**0.4%**	9.1%	4.7%	2.0%	2.1%	**0.1%**
Lykens	1.2%	0.7%	0.5%	0.6%	**0.1%**	1.3%	0.6%	0.6%	0.7%	**0.1%**
Newport	1.6%	0.8%	1.1%	2.4%	**1.3%**	1.6%	0.8%	1.2%	2.2%	**1.0%**
Troop T	**13.0%**	**9.0%**	**5.2%**	**3.3%**	**-1.9%**	**15.2%**	**9.8%**	**6.1%**	**4.4%**	**-1.7%**
Bowmansville	4.9%	2.7%	2.6%	3.0%	**0.4%**	7.9%	3.6%	3.9%	4.1%	**0.2%**
Everett	23.3%	16.5%	12.2%	4.8%	**-7.4%**	22.6%	15.5%	11.1%	4.7%	**-6.4%**
Gibsonia	4.6%	2.6%	1.8%	2.1%	**0.3%**	11.6%	6.8%	2.6%	2.1%	**-0.5%**
Highspire	3.1%	4.7%	6.9%	5.1%	**-1.8%**	6.3%	4.7%	6.2%	0.0%	**-6.2%**
Jefferson Hills[42]	--	--	--	6.4%	**--**	--	--	--	9.6%	**--**
King of Prussia	17.0%	6.3%	3.6%	3.5%	**-0.1%**	22.5%	9.6%	7.6%	10.4%	**2.8%**
New Stanton	11.9%	6.5%	3.8%	2.0%	**-1.8%**	13.5%	7.3%	5.3%	2.1%	**-3.2%**
Newville	5.1%	5.6%	2.6%	2.7%	**0.1%**	5.4%	4.7%	3.2%	2.1%	**-1.1%**
Pocono	2.2%	1.2%	1.8%	1.2%	**-0.6%**	2.3%	1.3%	1.8%	0.6%	**-1.2%**
Somerset (T)	29.5%	22.9%	14.1%	5.2%	**-8.9%**	30.0%	22.5%	13.2%	3.7%	**-9.5%**

[42] Jefferson Hills was created as a station and added to Troop T in March 2024. Therefore, it has no 2023 comparison data.

Table A.2. Area III Percent Unknown Race/Ethnicity of Drivers Stopped by Station, Comparisons Between 2022, 2023, and 2024

	UNKNOWN RACE					UNKNOWN ETHNICITY				
	1/1/22-8/11/22	8/12/22-12/31/22	2023	2024	Diff btw 2023 & 2024	1/1/22-8/11/22	8/12/22-12/31/22	2023	2024	Diff btw 2023 & 2024
Troop F	**3.7%**	**1.8%**	**2.3%**	**2.0%**	**-0.3%**	**4.3%**	**1.9%**	**2.3%**	**2.0%**	**-0.3%**
Coudersport	2.3%	2.5%	0.9%	2.0%	**-0.2%**	2.2%	2.3%	0.7%	1.7%	**1.0%**
Emporium	1.4%	0.2%	0.3%	0.7%	**2.7%**	1.3%	0.2%	0.3%	0.7%	**0.4%**
Lamar	5.2%	3.1%	3.9%	3.0%	**2.1%**	5.6%	2.5%	4.9%	3.0%	**-1.9%**
Mansfield	11.0%	3.0%	8.2%	6.0%	**-6.3%**	11.1%	2.4%	7.2%	5.4%	**-1.8%**
Milton	2.5%	1.5%	2.2%	1.9%	**-1.1%**	2.8%	1.7%	2.1%	1.5%	**-0.6%**
Montoursville	3.6%	0.9%	1.0%	1.1%	**1.0%**	3.8%	1.1%	1.2%	0.9%	**-0.3%**
Selinsgrove	3.1%	2.1%	1.2%	2.0%	**-0.2%**	6.5%	3.2%	1.3%	1.8%	**0.5%**
Stonington	0.6%	0.7%	0.9%	1.0%	**2.6%**	0.8%	0.5%	1.0%	0.8%	**-0.2%**
Troop N	**13.4%**	**4.1%**	**3.4%**	**3.5%**	**0.1%**	**18.0%**	**4.5%**	**3.3%**	**3.7%**	**0.4%**
Bloomsburg	14.7%	3.5%	4.9%	5.3%	**0.4%**	17.0%	3.6%	5.2%	5.2%	**0.0%**
Fern Ridge	4.8%	1.8%	1.0%	1.7%	**0.7%**	6.5%	2.0%	0.7%	1.7%	**1.0%**
Hazleton	24.0%	7.3%	5.2%	4.4%	**-0.8%**	24.7%	6.8%	4.4%	3.7%	**-0.7%**
Lehighton	20.3%	4.4%	3.7%	3.3%	**-0.4%**	24.3%	4.9%	4.2%	3.5%	**-0.7%**
Stroudsburg	10.8%	3.6%	2.8%	2.9%	**0.1%**	19.0%	4.6%	2.9%	4.0%	**1.1%**
Troop P	**2.8%**	**2.1%**	**2.7%**	**2.3%**	**-0.4%**	**3.1%**	**2.9%**	**3.1%**	**2.9%**	**-0.2%**
Laporte	2.6%	1.3%	0.3%	1.6%	**1.3%**	3.2%	1.5%	0.6%	1.7%	**1.1%**
Shickshinny	2.3%	2.0%	0.8%	0.9%	**0.1%**	2.0%	2.0%	1.0%	0.9%	**-0.1%**
Towanda	0.9%	1.1%	2.4%	1.2%	**-1.2%**	0.8%	1.6%	2.5%	1.4%	**-1.1%**
Tunkhannock	6.0%	2.5%	0.6%	0.8%	**0.2%**	7.6%	2.8%	0.6%	0.9%	**0.3%**
Wilkes-Barre	3.8%	3.3%	6.0%	4.7%	**-1.3%**	3.8%	5.2%	7.1%	6.1%	**-1.0%**
Troop R	**11.3%**	**6.0%**	**2.8%**	**2.3%**	**-0.5%**	**17.8%**	**8.6%**	**3.4%**	**2.9%**	**-0.5%**
Blooming Grove	18.2%	3.3%	1.5%	3.3%	**1.8%**	31.7%	10.3%	2.3%	4.0%	**1.7%**
Dunmore	5.5%	2.7%	1.5%	1.1%	**-0.4%**	13.7%	3.5%	2.1%	1.5%	**-0.6%**
Gibson	11.8%	9.7%	7.3%	4.6%	**-2.7%**	12.7%	8.5%	7.3%	5.6%	**-1.7%**
Honesdale	5.8%	10.8%	0.8%	0.9%	**0.1%**	8.6%	11.5%	1.8%	1.5%	**-0.3%**

Table A.2. Area IV & Specialized Units Percent Unknown Race/Ethnicity of Drivers Stopped by Station, Comparisons Between 2022, 2023, and 2024

	UNKNOWN RACE					UNKNOWN ETHNICITY				
	1/1/22-8/11/22	8/12/22-12/31/22	2023	2024	Diff btw 2023 & 2024	1/1/22-8/11/22	8/12/22-12/31/22	2023	2024	Diff btw 2023 & 2024
Troop J	**1.7%**	**1.0%**	**0.9%**	**1.1%**	**0.2%**	**2.9%**	**1.5%**	**1.0%**	**1.1%**	**0.1%**
Avondale	0.9%	0.3%	0.5%	0.5%	**0.0%**	1.8%	0.5%	0.5%	0.6%	**0.1%**
Embreeville	2.5%	1.8%	1.8%	1.9%	**0.1%**	3.2%	1.4%	1.6%	1.9%	**0.3%**
Lancaster	0.9%	0.7%	0.5%	0.5%	**0.0%**	1.8%	1.4%	1.0%	0.6%	**-0.4%**
York	2.2%	1.3%	2.5%	1.6%	**-0.9%**	4.5%	2.9%	2.9%	1.4%	**-1.5%**
Troop K	**5.8%**	**5.3%**	**3.4%**	**4.1%**	**0.7%**	**9.1%**	**6.9%**	**4.1%**	**5.9%**	**1.8%**
Media	2.9%	2.6%	1.3%	3.2%	**1.9%**	2.9%	2.4%	1.5%	5.5%	**4.0%**
Philadelphia	9.8%	8.6%	6.1%	6.0%	**-0.1%**	13.2%	9.3%	6.9%	7.8%	**0.9%**
Skippack	5.1%	3.3%	3.4%	2.6%	**-0.8%**	15.5%	12.6%	5.2%	2.9%	**-2.3%**
Troop L	**3.7%**	**2.4%**	**1.6%**	**2.4%**	**0.8%**	**5.1%**	**3.1%**	**2.3%**	**2.6%**	**0.3%**
Frackville	5.6%	4.5%	2.0%	0.9%	**-1.1%**	6.2%	5.5%	2.9%	1.0%	**-1.9%**
Hamburg	1.8%	0.9%	2.4%	8.0%	**5.6%**	3.7%	2.2%	3.5%	7.7%	**4.2%**
Jonestown	5.2%	3.5%	1.9%	1.7%	**-0.2%**	6.8%	4.2%	2.6%	1.7%	**-0.9%**
Reading	4.5%	2.1%	1.3%	2.1%	**0.8%**	7.2%	3.3%	2.3%	2.5%	**0.2%**
Schuylkill Haven	1.6%	1.1%	0.6%	1.6%	**1.0%**	1.9%	1.0%	0.8%	2.1%	**1.3%**
Troop M	**6.6%**	**4.2%**	**3.0%**	**5.1%**	**2.1%**	**8.7%**	**5.1%**	**3.8%**	**5.6%**	**1.8%**
Belfast	2.2%	2.0%	2.5%	2.0%	**-0.5%**	3.0%	2.6%	4.1%	3.4%	**-0.7%**
Bethlehem	13.5%	8.5%	4.6%	6.8%	**2.2%**	13.9%	8.7%	4.6%	6.3%	**1.7%**
Dublin	12.8%	5.6%	3.1%	6.7%	**3.6%**	14.0%	6.3%	3.4%	6.8%	**3.4%**
Fogelsville	2.7%	2.2%	2.6%	5.3%	**2.7%**	6.0%	4.5%	3.6%	6.9%	**3.3%**
Trevose	3.2%	2.8%	1.2%	2.4%	**1.2%**	7.0%	3.2%	2.6%	2.6%	**0.0%**
Specialized Units										
SHIELD	1.3%	0.6%	0.4%	0.6%	**0.2%**	7.3%	1.0%	0.3%	0.5%	**0.2%**
Canine	3.4%	3.1%	1.2%	1.5%	**0.3%**	3.1%	3.4%	2.9%	2.0%	**-0.9%**

Section 3 Supplemental Tables

Table A.3. Monthly Breakdown of Traffic Stops by Station, January - December 2024

	Total # of Stops	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
AREA I													
Troop B													
Belle Vernon	4,892	4.9%	7.3%	11.9%	7.0%	13.4%	7.4%	10.5%	7.6%	6.6%	6.2%	10.5%	6.8%
Pittsburgh	6,309	3.9%	7.4%	11.3%	6.7%	12.8%	7.4%	10.0%	4.4%	8.9%	6.3%	14.1%	6.8%
Uniontown	8,157	5.1%	8.4%	7.8%	7.8%	15.5%	6.9%	10.6%	9.4%	8.7%	4.9%	8.8%	6.0%
Washington	5,466	4.2%	6.3%	9.6%	6.5%	10.3%	6.2%	14.0%	8.7%	9.5%	6.3%	11.3%	7.1%
Waynesburg	2,151	5.2%	6.9%	11.3%	4.1%	8.7%	5.3%	20.1%	6.7%	6.8%	4.2%	14.6%	6.0%
Troop C													
Clarion	4,121	3.8%	6.7%	5.8%	5.6%	10.4%	4.0%	12.8%	9.6%	10.7%	7.4%	16.1%	7.0%
Clearfield	5,046	5.9%	5.4%	9.7%	7.2%	13.6%	7.6%	11.1%	9.4%	7.5%	5.4%	11.4%	5.8%
Dubois	3,582	3.9%	8.7%	13.0%	4.7%	13.6%	4.7%	11.0%	10.6%	10.9%	4.1%	11.5%	3.3%
Lewis Run	4,638	6.3%	11.6%	8.5%	8.6%	10.9%	6.3%	10.3%	10.9%	7.6%	5.6%	9.0%	4.4%
Marienville	3,821	5.2%	6.2%	6.9%	6.1%	8.9%	7.7%	11.7%	10.8%	7.6%	7.5%	14.0%	7.4%
Punxsutawney	3,082	8.3%	6.7%	9.7%	8.9%	14.0%	6.5%	8.2%	7.9%	8.4%	5.0%	10.6%	5.7%
Ridgway	3,283	4.1%	5.8%	11.3%	8.3%	14.2%	6.3%	11.5%	11.6%	6.7%	5.6%	10.7%	3.9%
Troop D													
Beaver	3,701	7.3%	8.3%	9.5%	4.8%	16.7%	6.6%	7.3%	7.7%	8.3%	6.2%	13.7%	3.4%
Butler	5,081	5.3%	9.5%	14.3%	8.4%	11.6%	9.3%	9.2%	6.7%	6.8%	3.4%	9.4%	6.0%
Kittanning	6,272	6.4%	7.9%	9.9%	5.2%	10.3%	8.0%	11.8%	9.0%	8.4%	4.6%	11.4%	7.1%
Mercer	3,419	5.7%	10.2%	11.0%	7.1%	10.5%	10.2%	9.9%	8.7%	9.3%	5.3%	8.5%	3.7%
New Castle	2,094	7.3%	9.7%	8.4%	8.5%	9.1%	6.9%	11.5%	10.1%	6.2%	4.4%	9.8%	8.0%
Troop E													
Corry	2,311	4.9%	9.0%	13.1%	12.1%	12.0%	6.1%	6.7%	5.7%	7.0%	4.7%	11.8%	6.9%
Erie	7,631	6.7%	7.9%	10.7%	4.1%	10.0%	6.8%	9.9%	10.6%	6.5%	6.0%	12.4%	8.3%
Franklin	2,241	5.0%	4.8%	10.6%	7.1%	14.6%	6.7%	10.1%	10.1%	6.5%	6.8%	10.4%	7.1%
Girard	7,439	5.8%	9.0%	11.0%	6.5%	9.2%	7.7%	11.5%	8.8%	6.6%	6.6%	8.5%	8.9%
Meadville	3,419	7.5%	12.1%	9.7%	6.5%	9.2%	7.1%	9.3%	6.4%	7.3%	6.6%	12.7%	5.5%
Warren	2,637	4.7%	9.1%	12.1%	8.5%	14.7%	5.0%	10.0%	8.9%	7.9%	4.1%	8.6%	6.4%

	Total # of Stops	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
AREA II													
Troop A													
Ebensburg	2,343	4.1%	5.1%	14.9%	8.1%	13.0%	4.1%	10.3%	8.5%	6.9%	4.6%	14.4%	6.1%
Greensburg	6,057	7.2%	8.2%	12.3%	7.3%	14.7%	7.0%	9.8%	6.8%	6.0%	3.8%	12.2%	4.8%
Indiana	4,649	6.5%	9.3%	13.6%	6.7%	9.4%	8.0%	9.6%	8.0%	6.6%	4.4%	9.0%	9.0%
Kiski Valley	1,886	2.2%	3.8%	14.8%	2.5%	12.8%	3.1%	12.6%	10.8%	9.8%	6.7%	12.9%	7.8%
Somerset (A)	2,706	5.0%	7.0%	12.9%	9.6%	12.4%	6.7%	9.9%	7.9%	5.9%	4.4%	10.0%	8.3%
Troop G													
Bedford	4,970	7.0%	8.9%	11.8%	5.2%	16.8%	5.2%	10.4%	5.8%	7.0%	4.9%	11.7%	5.3%
Hollidaysburg	3,142	4.6%	4.6%	9.8%	12.2%	15.2%	9.9%	10.4%	7.2%	4.6%	4.4%	11.1%	6.0%
Huntingdon	4,018	8.3%	7.2%	12.4%	6.9%	11.4%	6.9%	12.7%	8.8%	6.5%	3.9%	10.6%	4.3%
Lewistown	5,009	5.0%	7.1%	8.6%	4.8%	15.3%	6.7%	12.6%	9.3%	7.4%	5.6%	12.3%	5.3%
McConnellsburg	2,630	6.6%	6.5%	12.2%	8.5%	15.7%	7.8%	13.6%	8.7%	5.7%	3.0%	7.5%	4.2%
Rockview	6,683	5.5%	7.0%	12.5%	7.9%	18.5%	3.9%	12.9%	7.8%	6.9%	2.7%	10.1%	4.2%
Troop H													
Carlisle	11,472	10.4%	8.3%	7.7%	8.1%	11.7%	6.3%	7.5%	7.1%	8.0%	7.3%	8.4%	9.1%
Chambersburg	11,400	6.1%	7.7%	8.0%	5.6%	11.6%	6.7%	10.1%	8.8%	8.0%	5.4%	11.7%	10.1%
Gettysburg	10,309	8.5%	8.6%	9.1%	8.0%	10.8%	9.1%	8.2%	8.3%	6.2%	6.0%	8.5%	8.8%
Harrisburg	9,286	6.8%	7.8%	9.9%	8.4%	12.5%	8.1%	9.4%	7.1%	8.0%	5.8%	8.8%	7.4%
Lykens	3,715	5.1%	6.5%	9.0%	6.4%	10.6%	8.1%	9.3%	6.8%	10.7%	7.6%	11.4%	8.3%
Newport	3,728	5.4%	3.6%	8.8%	4.9%	13.3%	8.9%	10.5%	9.6%	11.3%	3.3%	12.7%	7.7%
Troop T													
Bowmansville	4,850	6.9%	8.5%	10.1%	10.8%	8.7%	7.1%	7.4%	10.7%	9.2%	9.1%	7.5%	4.0%
Everett	5,388	7.4%	8.0%	8.9%	9.2%	11.1%	8.1%	11.8%	8.2%	8.1%	6.9%	7.7%	4.7%
Gibsonia	5,878	7.3%	9.0%	6.9%	10.2%	12.3%	8.3%	8.5%	7.3%	8.5%	8.1%	8.4%	5.3%
Highspire	79	1.3%	5.1%	8.9%	2.5%	5.1%	16.5%	3.8%	6.3%	2.5%	19.0%	27.8%	1.3%
Jefferson Hills	4,736	0.1%	0.1%	8.4%	12.1%	12.1%	9.2%	10.8%	13.6%	10.7%	9.3%	7.5%	5.9%
King of Prussia	5,722	8.7%	10.3%	10.1%	10.0%	9.9%	7.8%	7.7%	5.4%	6.7%	6.6%	10.7%	6.3%
New Stanton	4,414	12.5%	14.9%	10.0%	7.1%	11.0%	6.0%	7.8%	6.7%	6.1%	6.7%	6.8%	4.3%
Newville	5,797	6.0%	8.1%	9.6%	10.8%	10.5%	7.9%	7.2%	9.7%	8.8%	10.1%	7.0%	4.3%
Pocono	5,395	4.6%	7.7%	8.6%	8.9%	10.2%	8.0%	8.4%	5.1%	9.8%	12.7%	10.0%	5.9%
Somerset (T)	4,314	6.6%	9.4%	8.6%	9.2%	8.9%	9.3%	12.2%	6.4%	7.1%	6.4%	8.9%	6.9%

	Total # of Stops	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
AREA III													
Troop F													
Coudersport	4,696	7.0%	8.6%	12.3%	10.1%	11.3%	6.7%	9.3%	9.8%	6.5%	6.9%	7.6%	3.8%
Emporium	1,043	3.0%	8.4%	10.3%	10.4%	14.3%	10.9%	10.0%	7.0%	7.5%	3.8%	9.1%	5.4%
Lamar	3,901	5.4%	6.5%	14.0%	6.7%	14.3%	6.8%	8.8%	7.4%	8.5%	4.2%	12.6%	4.9%
Mansfield	3,348	2.6%	9.1%	14.1%	5.6%	14.7%	4.4%	10.5%	13.1%	9.5%	4.5%	7.2%	4.7%
Milton	6,786	5.2%	8.2%	11.6%	8.7%	17.0%	8.1%	10.6%	6.5%	5.5%	4.5%	10.1%	4.2%
Montoursville	6,099	4.7%	4.7%	6.9%	6.4%	16.8%	9.0%	12.8%	8.5%	7.0%	4.6%	9.4%	9.2%
Selinsgrove	3,964	7.9%	7.6%	9.9%	7.5%	11.0%	12.0%	8.9%	6.6%	7.2%	5.2%	9.1%	7.0%
Stonington	2,614	6.7%	7.7%	8.3%	9.3%	21.4%	6.2%	8.9%	5.0%	3.9%	4.0%	13.4%	5.1%
Troop N													
Bloomsburg	2,779	3.6%	6.9%	14.8%	6.3%	16.5%	6.0%	9.4%	7.4%	8.0%	4.0%	11.9%	5.3%
Fern Ridge	3,275	3.5%	3.7%	19.1%	3.2%	12.8%	4.8%	12.9%	8.3%	9.4%	3.6%	12.6%	6.2%
Hazleton	6,950	5.0%	4.6%	9.7%	7.5%	12.1%	7.3%	10.7%	10.4%	7.3%	6.1%	11.8%	7.4%
Lehighton	3,277	6.8%	6.5%	7.7%	7.6%	12.5%	7.5%	10.2%	8.1%	4.7%	5.5%	14.5%	8.4%
Stroudsburg	8,848	7.5%	7.7%	12.3%	7.4%	11.8%	5.9%	7.1%	7.0%	7.2%	10.0%	9.9%	6.1%
Troop P													
Laporte	1,647	3.8%	6.6%	10.1%	7.5%	12.3%	11.8%	14.0%	8.1%	9.0%	4.5%	9.5%	2.8%
Shickshinny	1,401	2.7%	4.6%	10.6%	5.6%	12.3%	15.2%	13.9%	7.3%	5.7%	4.4%	13.3%	4.5%
Towanda	3,184	6.7%	7.9%	10.6%	7.2%	11.1%	8.4%	14.5%	9.3%	10.1%	2.8%	8.3%	3.2%
Tunkhannock	2,069	2.9%	4.9%	7.6%	4.2%	8.4%	12.4%	12.6%	12.8%	10.4%	5.6%	11.6%	6.6%
Wilkes-Barre	4,154	3.9%	5.8%	9.3%	6.6%	12.5%	10.4%	13.0%	11.0%	9.1%	3.2%	9.0%	6.4%
Troop R													
Blooming Grove	3,188	6.8%	9.0%	10.7%	4.5%	10.2%	7.4%	11.8%	10.3%	9.8%	4.5%	9.8%	5.2%
Dunmore	3,756	2.9%	5.5%	6.9%	7.0%	11.4%	12.0%	13.5%	13.9%	8.5%	3.9%	9.2%	5.2%
Gibson	1,774	4.8%	10.3%	13.8%	4.7%	11.7%	12.5%	13.1%	10.9%	4.3%	3.3%	7.8%	2.8%
Honesdale	2,053	7.2%	10.6%	10.4%	10.2%	11.0%	9.8%	5.5%	11.5%	6.3%	5.6%	6.3%	5.6%

	Total # of Stops	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
AREA IV													
Troop J													
Avondale	8,289	4.4%	10.6%	12.7%	8.1%	10.1%	5.6%	10.4%	8.0%	8.1%	5.9%	7.8%	8.5%
Embreeville	7,489	7.5%	7.9%	7.5%	8.7%	13.0%	7.5%	8.8%	8.1%	7.7%	7.6%	7.8%	8.0%
Lancaster	10,528	7.2%	7.8%	8.6%	8.6%	9.1%	6.0%	9.4%	8.5%	8.6%	7.6%	8.2%	10.3%
York	11,559	6.9%	9.2%	9.4%	7.5%	9.2%	6.6%	10.1%	7.0%	8.7%	8.9%	9.5%	7.0%
Troop K													
Media	12,255	7.2%	9.5%	9.7%	10.5%	9.3%	7.0%	10.1%	8.2%	6.8%	6.9%	9.4%	5.5%
Philadelphia	8,430	5.6%	9.4%	12.3%	6.7%	6.3%	7.9%	10.2%	10.3%	8.3%	5.6%	11.1%	6.4%
Skippack	3,528	4.8%	5.4%	12.0%	4.8%	15.2%	4.0%	11.5%	8.8%	5.9%	4.2%	14.5%	8.9%
Troop L													
Frackville	3,872	4.9%	4.9%	11.6%	9.5%	10.7%	8.5%	9.8%	7.2%	6.5%	8.8%	9.5%	8.2%
Hamburg	2,423	4.9%	7.2%	13.3%	8.5%	12.3%	6.9%	11.7%	5.7%	7.0%	6.1%	9.8%	6.5%
Jonestown	4,806	8.8%	6.5%	13.1%	8.2%	12.6%	6.7%	9.1%	7.6%	4.6%	3.6%	12.9%	6.3%
Reading	5,599	5.4%	5.5%	11.8%	6.3%	15.4%	5.5%	11.8%	9.1%	6.4%	4.9%	11.4%	6.5%
Schuylkill Haven	4,307	6.2%	8.1%	11.5%	6.2%	11.9%	4.1%	9.4%	7.8%	8.1%	7.6%	11.7%	7.3%
Troop M													
Belfast	2,646	5.1%	6.9%	14.7%	7.8%	13.0%	7.4%	11.4%	7.4%	7.1%	3.8%	8.4%	7.0%
Bethlehem	6,917	6.4%	5.5%	10.0%	5.0%	9.2%	8.1%	8.2%	9.5%	11.0%	7.5%	11.5%	8.2%
Dublin	3,043	7.1%	9.3%	10.2%	8.3%	11.0%	7.8%	9.6%	10.4%	8.3%	3.7%	7.3%	7.0%
Fogelsville	6,488	6.0%	10.7%	9.5%	6.5%	7.4%	6.7%	9.3%	9.1%	10.2%	8.5%	8.3%	7.7%
Trevose	3,250	4.2%	5.0%	13.1%	8.6%	8.7%	6.0%	10.2%	9.2%	9.0%	7.3%	9.6%	9.2%
Specialized Units													
SHIELD	3,930	7.7%	11.1%	7.9%	8.3%	8.7%	9.6%	9.3%	7.4%	8.1%	9.5%	7.0%	5.5%
Canine	913	8.0%	14.5%	9.9%	6.8%	6.9%	8.8%	8.5%	13.1%	7.3%	6.9%	5.6%	3.7%

Table A.4. Area I Traffic Stop Descriptives by Station, Jan - Dec 2024

	Total #of Stops	Week-day	Day-time	Roadway Type				PA Regist. Vehicle	Vehicles with Pass	Duration of Stop (minutes)			
				Inter	State	Local	Other			1-15	16-30	31-60	61+
Troop B													
Belle Vernon	4,892	71.7%	73.5%	25.0%	53.8%	20.9%	0.3%	90.0%	19.1%	91.8%	6.3%	0.9%	1.0%
Pittsburgh	6,309	72.7%	70.5%	75.6%	16.7%	7.3%	0.4%	91.7%	7.6%	96.2%	3.0%	0.6%	0.1%
Uniontown	8,157	72.4%	63.2%	2.0%	67.6%	30.2%	0.2%	93.2%	16.9%	91.4%	6.7%	1.2%	0.7%
Washington	5,466	70.0%	63.1%	51.0%	26.4%	21.9%	0.6%	87.1%	20.9%	91.4%	7.3%	0.8%	0.5%
Waynesburg	2,151	71.1%	83.9%	17.3%	77.4%	5.3%	0.0%	86.1%	18.6%	97.5%	2.1%	0.1%	0.2%
Troop C													
Clarion	4,121	62.6%	66.1%	33.6%	62.4%	3.9%	0.1%	77.0%	20.8%	95.0%	4.1%	0.5%	0.3%
Clearfield	5,046	67.9%	66.6%	41.9%	53.1%	4.9%	0.1%	70.4%	6.3%	95.6%	3.1%	0.6%	0.8%
Dubois	3,582	60.5%	72.6%	47.8%	46.5%	5.5%	0.2%	68.4%	20.4%	94.9%	2.0%	0.9%	2.1%
Lewis Run	4,638	69.1%	56.5%	2.7%	80.2%	17.1%	0.0%	77.8%	20.1%	90.0%	7.0%	2.0%	1.0%
Marienville	3,821	66.3%	65.9%	0.8%	94.6%	4.5%	0.1%	89.1%	20.3%	96.3%	2.2%	1.0%	0.5%
Punxsutawney	3,082	65.8%	69.2%	3.4%	90.6%	5.9%	0.0%	94.3%	27.5%	87.9%	8.9%	2.3%	0.9%
Ridgway	3,283	65.9%	78.3%	0.5%	93.5%	6.0%	0.1%	75.2%	9.2%	96.7%	3.1%	0.2%	0.0%
Troop D													
Beaver	3,701	69.9%	81.4%	44.6%	34.2%	21.1%	0.1%	91.0%	11.2%	91.4%	7.1%	1.2%	0.3%
Butler	5,081	69.9%	65.3%	12.0%	73.3%	13.8%	0.9%	93.0%	13.6%	93.6%	4.0%	1.5%	0.9%
Kittanning	6,272	66.2%	62.3%	1.0%	88.0%	11.0%	0.0%	89.7%	12.2%	88.0%	7.8%	2.4%	1.9%
Mercer	3,419	69.0%	79.6%	42.6%	52.6%	4.7%	0.1%	83.2%	17.7%	93.7%	5.0%	0.6%	0.6%
New Castle	2,094	69.2%	72.4%	28.4%	51.5%	19.3%	0.8%	89.4%	14.8%	88.5%	5.3%	2.7%	3.4%
Troop E													
Corry	2,311	68.6%	65.0%	0.5%	89.2%	10.3%	0.0%	93.0%	16.2%	97.1%	2.3%	0.4%	0.3%
Erie	7,631	64.6%	54.9%	19.8%	44.9%	35.1%	0.2%	83.0%	7.6%	94.5%	5.0%	0.4%	0.1%
Franklin	2,241	66.3%	57.2%	8.8%	60.1%	29.3%	1.8%	87.8%	19.2%	84.6%	10.4%	2.0%	3.1%
Girard	7,439	71.5%	65.4%	47.9%	40.8%	11.2%	0.1%	84.0%	18.1%	90.8%	7.8%	1.0%	0.3%
Meadville	3,419	70.1%	55.4%	27.2%	53.6%	18.8%	0.3%	84.1%	20.1%	92.2%	6.1%	1.2%	0.4%
Warren	2,637	62.0%	67.6%	0.3%	94.0%	5.6%	0.0%	86.0%	7.9%	96.2%	3.1%	0.4%	0.3%

Table A.4. Area II Traffic Stop Descriptives by Station, Jan - Dec 2024

	Total #of Stops	Week-day	Day-time	Roadway Type				PA Regist. Vehicle	Vehicles with Pass	Duration of Stop (minutes)			
				Inter	State	Local	Other			1-15	16-30	31-60	61+
Troop A													
Ebensburg	2,343	69.7%	80.5%	0.6%	92.5%	6.8%	0.1%	88.9%	18.8%	91.9%	3.8%	1.6%	2.6%
Greensburg	6,057	72.6%	69.6%	2.5%	77.0%	20.3%	0.2%	95.7%	21.0%	89.9%	7.9%	1.2%	1.1%
Indiana	4,649	75.5%	84.2%	0.3%	94.5%	4.9%	0.2%	89.2%	4.2%	94.3%	3.8%	1.5%	0.5%
Kiski Valley	1,886	67.3%	77.6%	0.8%	89.6%	9.5%	0.1%	94.8%	14.2%	95.2%	4.4%	0.4%	0.1%
Somerset (A)	2,706	69.5%	65.7%	1.5%	83.3%	15.0%	0.2%	94.5%	14.4%	92.9%	5.5%	0.8%	0.7%
Troop G													
Bedford	4,970	67.1%	72.1%	18.3%	73.9%	7.7%	0.1%	78.4%	22.9%	95.8%	2.3%	0.6%	1.2%
Hollidaysburg	3,142	73.1%	77.2%	41.2%	44.3%	14.2%	0.2%	91.5%	17.3%	92.6%	6.1%	0.8%	0.5%
Huntingdon	4,018	75.0%	74.6%	2.8%	94.3%	2.9%	0.0%	94.6%	10.6%	94.7%	4.9%	0.1%	0.2%
Lewistown	5,009	67.5%	78.9%	0.7%	92.2%	7.0%	0.1%	91.6%	24.8%	96.5%	2.9%	0.5%	0.1%
McConnellsburg	2,630	70.5%	65.5%	48.8%	48.3%	2.8%	0.1%	55.9%	4.3%	94.8%	3.6%	0.9%	0.7%
Rockview	6,683	68.3%	71.0%	37.8%	56.7%	4.7%	0.7%	84.0%	7.4%	94.0%	5.8%	0.2%	0.0%
Troop H													
Carlisle	11,472	74.0%	54.1%	40.4%	33.6%	25.8%	0.2%	81.6%	16.1%	86.9%	9.5%	3.0%	0.7%
Chambersburg	11,400	68.5%	53.8%	27.5%	58.2%	14.0%	0.3%	81.0%	15.2%	92.8%	4.9%	1.6%	0.7%
Gettysburg	10,309	69.6%	54.9%	1.6%	90.0%	8.2%	0.1%	71.4%	8.6%	93.0%	5.0%	1.6%	0.4%
Harrisburg	9,286	70.2%	50.8%	56.3%	31.3%	12.1%	0.3%	78.1%	17.3%	82.1%	11.8%	4.9%	1.2%
Lykens	3,715	72.9%	61.6%	3.4%	82.7%	13.7%	0.1%	95.8%	25.3%	93.5%	5.4%	0.6%	0.4%
Newport	3,728	72.2%	62.4%	4.4%	85.4%	10.0%	0.2%	89.1%	18.6%	87.6%	8.6%	2.7%	1.1%
Troop T													
Bowmansville	4,850	76.5%	79.0%	95.6%	3.3%	1.1%	0.0%	78.9%	22.8%	93.3%	6.1%	0.5%	0.1%
Everett	5,388	76.5%	71.7%	94.0%	1.0%	0.2%	4.8%	48.8%	20.2%	92.3%	6.1%	1.2%	0.4%
Gibsonia	5,878	74.7%	87.2%	95.1%	3.7%	1.2%	0.0%	75.3%	17.6%	92.6%	6.9%	0.3%	0.2%
Highspire	79	82.3%	65.8%	89.9%	3.8%	6.3%	0.0%	81.0%	29.1%	82.3%	15.2%	2.5%	0.0%
Jefferson Hills	4,736	74.3%	89.1%	56.6%	30.8%	1.4%	11.3%	73.4%	21.5%	94.2%	4.7%	0.9%	0.2%
King of Prussia	5,722	74.8%	80.6%	95.5%	2.6%	0.6%	1.3%	83.4%	14.7%	90.9%	8.1%	0.8%	0.2%
New Stanton	4,414	79.7%	87.5%	58.1%	25.0%	2.5%	14.4%	80.7%	24.7%	93.3%	5.5%	0.8%	0.4%
Newville	5,797	75.1%	80.7%	99.2%	0.7%	0.1%	0.1%	59.9%	42.0%	84.4%	14.3%	1.1%	0.2%
Pocono	5,395	73.3%	81.0%	63.7%	36.1%	0.1%	0.1%	76.3%	26.8%	96.1%	3.4%	0.5%	0.0%
Somerset (T)	4,314	74.5%	86.7%	95.0%	2.7%	1.6%	0.8%	55.2%	15.5%	92.9%	5.2%	1.3%	0.5%

Table A.4. Area III Traffic Stop Descriptives by Station, Jan - Dec 2024

	Total #of Stops	Week-day	Day-time	Roadway Type				PA Regist. Vehicle	Vehicles with Pass	Duration of Stop (minutes)			
				Inter	State	Local	Other			1-15	16-30	31-60	61+
Troop F													
Coudersport	4,696	63.8%	68.5%	0.7%	92.7%	6.5%	0.1%	85.0%	19.6%	94.6%	3.4%	1.1%	0.9%
Emporium	1,043	69.7%	78.6%	0.8%	94.7%	4.4%	0.1%	89.8%	25.4%	95.1%	4.0%	0.5%	0.4%
Lamar	3,901	66.6%	69.2%	48.4%	43.4%	8.1%	0.1%	65.1%	20.4%	96.0%	2.1%	1.4%	0.5%
Mansfield	3,348	60.4%	72.6%	1.6%	89.5%	8.9%	0.0%	67.7%	16.8%	95.2%	2.6%	0.5%	1.6%
Milton	6,786	68.6%	65.0%	27.4%	68.6%	4.0%	0.1%	79.0%	14.2%	96.2%	2.4%	1.0%	0.4%
Montoursville	6,099	67.0%	58.9%	38.6%	41.9%	19.0%	0.5%	88.9%	19.5%	89.8%	7.6%	1.7%	0.9%
Selinsgrove	3,964	65.1%	69.5%	1.3%	92.2%	6.4%	0.1%	81.1%	22.2%	93.8%	5.0%	1.0%	0.3%
Stonington	2,614	70.2%	74.9%	0.4%	87.4%	12.1%	0.1%	97.1%	9.7%	96.2%	2.9%	0.8%	0.1%
Troop N													
Bloomsburg	2,779	67.0%	63.2%	56.8%	36.9%	6.2%	0.0%	73.8%	17.3%	95.2%	2.2%	1.3%	1.3%
Fern Ridge	3,275	66.9%	77.1%	64.4%	31.4%	3.8%	0.4%	64.4%	18.0%	93.5%	5.8%	0.6%	0.1%
Hazleton	6,950	70.3%	63.2%	48.8%	35.2%	15.6%	0.4%	80.6%	13.9%	88.8%	5.6%	2.5%	3.1%
Lehighton	3,277	67.0%	66.1%	4.5%	79.9%	14.7%	0.9%	91.2%	18.9%	87.7%	8.8%	2.0%	1.5%
Stroudsburg	8,848	69.3%	70.6%	28.3%	48.8%	22.7%	0.2%	80.2%	17.5%	88.8%	7.5%	2.8%	0.9%
Troop P													
Laporte	1,647	74.1%	80.9%	3.9%	86.5%	9.6%	0.0%	92.0%	16.2%	94.7%	3.0%	1.1%	1.2%
Shickshinny	1,401	74.4%	84.1%	2.1%	89.7%	8.1%	0.2%	95.9%	10.3%	94.6%	4.9%	0.4%	0.2%
Towanda	3,184	71.8%	78.0%	0.8%	84.9%	13.7%	0.5%	89.5%	8.5%	93.8%	4.1%	1.0%	1.0%
Tunkhannock	2,069	71.0%	78.0%	1.2%	96.9%	1.9%	0.0%	92.0%	9.2%	93.0%	4.1%	2.0%	0.9%
Wilkes-Barre	4,154	76.2%	80.9%	26.9%	55.7%	16.9%	0.6%	85.2%	10.8%	88.5%	9.6%	1.3%	0.6%
Troop R													
Blooming Grove	3,188	68.5%	67.4%	59.2%	29.6%	10.7%	0.5%	67.4%	15.5%	87.8%	5.6%	4.7%	1.9%
Dunmore	3,756	76.7%	81.0%	40.9%	49.4%	9.6%	0.1%	85.2%	19.1%	81.5%	15.8%	2.2%	0.5%
Gibson	1,774	72.8%	85.2%	58.7%	34.0%	7.3%	0.1%	59.4%	21.3%	91.7%	5.1%	2.8%	0.5%
Honesdale	2,053	78.3%	87.1%	5.4%	88.9%	5.6%	0.1%	92.1%	14.6%	93.2%	5.7%	0.8%	0.3%

Table A.4. Area III Traffic Stop Descriptives by Station, Jan - Dec 2024

	Total #of Stops	Week-day	Day-time	Roadway Type				PA Regist. Vehicle	Vehicles with Pass	Duration of Stop (minutes)			
				Inter	State	Local	Other			1-15	16-30	31-60	61+
Troop J													
Avondale	8,289	69.1%	45.5%	0.9%	88.5%	9.0%	1.5%	78.2%	14.9%	89.5%	5.6%	4.5%	0.4%
Embreeville	7,489	73.3%	61.4%	3.9%	91.4%	4.6%	0.1%	88.8%	13.3%	90.1%	6.9%	1.4%	1.5%
Lancaster	10,528	73.3%	54.8%	3.0%	84.7%	12.3%	0.0%	90.4%	17.0%	87.1%	9.1%	1.9%	1.9%
York	11,559	73.3%	47.6%	55.9%	28.5%	14.9%	0.7%	77.4%	7.9%	91.5%	5.2%	2.1%	1.2%
Troop K													
Media	12,255	71.8%	44.9%	65.3%	29.6%	5.0%	0.1%	75.2%	10.9%	91.4%	5.9%	1.7%	1.0%
Philadelphia	8,430	73.4%	65.0%	78.0%	7.4%	14.3%	0.3%	83.5%	15.5%	87.1%	9.3%	2.0%	1.6%
Skippack	3,528	67.9%	59.8%	14.0%	69.6%	15.9%	0.5%	93.1%	11.3%	90.3%	7.5%	1.7%	0.5%
Troop L													
Frackville	3,872	76.5%	74.2%	34.0%	54.6%	11.3%	0.1%	84.8%	17.3%	91.4%	7.5%	0.8%	0.3%
Hamburg	2,423	72.6%	75.7%	34.4%	51.6%	13.9%	0.1%	83.0%	23.2%	88.5%	10.2%	0.9%	0.5%
Jonestown	4,806	67.9%	65.0%	37.1%	42.5%	20.4%	0.1%	79.0%	11.7%	92.5%	5.8%	1.1%	0.5%
Reading	5,599	69.0%	69.4%	10.1%	72.7%	16.9%	0.3%	91.7%	12.3%	93.0%	5.7%	1.0%	0.3%
Schuylkill Haven	4,307	71.0%	66.9%	3.1%	80.2%	16.6%	0.2%	95.1%	15.6%	92.6%	5.6%	1.5%	0.4%
Troop M													
Belfast	2,646	69.0%	61.8%	26.0%	65.0%	8.9%	0.1%	76.7%	16.7%	91.1%	5.7%	2.0%	1.2%
Bethlehem	6,917	68.1%	47.2%	4.4%	85.6%	9.8%	0.2%	89.8%	12.1%	87.2%	9.7%	2.2%	0.9%
Dublin	3,043	69.4%	64.7%	2.3%	89.8%	7.6%	0.3%	93.0%	10.2%	89.9%	8.7%	0.8%	0.6%
Fogelsville	6,488	66.6%	46.7%	33.6%	40.9%	23.0%	2.5%	82.4%	13.4%	88.2%	8.4%	2.7%	0.8%
Trevose	3,250	67.4%	65.4%	77.6%	17.9%	4.4%	0.1%	72.9%	16.4%	83.7%	12.6%	0.8%	3.0%
Specialized Units													
SHIELD	3,930	94.9%	94.9%	98.1%	1.2%	0.7%	0.0%	25.1%	28.9%	77.5%	12.7%	6.6%	3.2%
Canine	913	84.6%	91.2%	72.8%	15.2%	11.4%	0.5%	44.1%	25.2%	83.6%	9.7%	4.2%	2.5%

Table A.5. Area I Reason for Stop by Station, Jan - Dec 2024

	Total # of Stops	Speeding	Avg. Amount Over Limit (MPH)	Other Moving Violation	Equipment/ Inspection	Registration	License	Other
Troop B								
Belle Vernon	4,892	17.8%	20.5%	21.0%	32.1%	37.7%	7.0%	2.0%
Pittsburgh	6,309	29.5%	24.1%	22.6%	20.1%	32.6%	3.1%	2.0%
Uniontown	8,157	15.4%	19.7%	28.5%	25.0%	30.9%	7.1%	1.8%
Washington	5,466	17.6%	25.3%	28.2%	26.6%	32.8%	5.5%	2.7%
Waynesburg	2,151	41.0%	21.9%	18.9%	18.7%	23.3%	2.5%	1.2%
Troop C								
Clarion	4,121	42.8%	17.3%	19.0%	16.6%	19.0%	3.0%	2.7%
Clearfield	5,046	55.7%	17.3%	15.4%	16.4%	12.5%	2.6%	1.1%
Dubois	3,582	51.6%	19.4%	16.5%	17.4%	15.5%	2.1%	1.7%
Lewis Run	4,638	24.6%	17.8%	21.4%	41.6%	14.3%	3.3%	0.9%
Marienville	3,821	35.9%	18.6%	14.3%	30.2%	18.6%	2.9%	2.3%
Punxsutawney	3,082	32.9%	17.9%	18.2%	36.0%	18.7%	4.2%	3.3%
Ridgway	3,283	54.8%	19.0%	11.5%	18.9%	12.9%	2.7%	1.4%
Troop D								
Beaver	3,701	20.1%	25.5%	16.3%	28.2%	34.5%	5.6%	1.6%
Butler	5,081	34.9%	21.4%	27.9%	17.5%	24.0%	3.8%	1.5%
Kittanning	6,272	27.6%	25.8%	33.6%	17.8%	21.6%	6.7%	2.2%
Mercer	3,419	36.8%	20.8%	16.8%	18.7%	29.4%	2.9%	2.6%
New Castle	2,094	26.2%	23.0%	19.5%	14.5%	38.4%	6.0%	2.2%
Troop E								
Corry	2,311	32.4%	17.8%	11.5%	30.1%	24.4%	3.1%	1.7%
Erie	7,631	16.6%	21.9%	29.4%	27.1%	24.7%	7.2%	1.3%
Franklin	2,241	27.4%	18.9%	27.7%	22.9%	21.3%	5.8%	2.5%
Girard	7,439	36.5%	19.8%	15.4%	33.9%	13.9%	2.5%	1.6%
Meadville	3,419	31.7%	17.2%	23.0%	24.7%	17.8%	4.2%	2.7%
Warren	2,637	57.3%	17.3%	11.5%	17.2%	14.4%	2.4%	1.2%

Table A.5. Area II Reason for Stop by Station, Jan - Dec 2024

	Total # of Stops	Speeding	Avg. Amount Over Limit (MPH)	Other Moving Violation	Equipment/ Inspection	Registration	License	Other
Troop A								
Ebensburg	2,343	56.3%	24.3%	9.9%	6.6%	27.7%	1.8%	0.9%
Greensburg	6,057	25.4%	21.9%	20.5%	19.7%	39.1%	4.6%	1.6%
Indiana	4,649	55.2%	23.7%	15.5%	7.9%	21.9%	2.3%	0.7%
Kiski Valley	1,886	27.7%	24.6%	18.3%	19.4%	40.7%	4.8%	2.3%
Somerset (A)	2,706	24.7%	20.1%	21.0%	22.0%	34.0%	3.8%	2.0%
Troop G								
Bedford	4,970	40.3%	20.3%	13.3%	17.0%	30.1%	2.7%	1.6%
Hollidaysburg	3,142	26.5%	22.0%	15.5%	13.9%	43.3%	3.9%	2.0%
Huntingdon	4,018	42.2%	19.4%	23.3%	11.3%	25.2%	3.2%	0.8%
Lewistown	5,009	50.5%	20.8%	13.6%	12.0%	26.8%	2.0%	1.1%
McConnellsburg	2,630	44.1%	24.8%	31.2%	12.1%	14.0%	1.4%	1.3%
Rockview	6,683	53.8%	21.7%	20.1%	10.8%	19.3%	2.6%	0.9%
Troop H								
Carlisle	11,472	23.1%	21.2%	31.2%	24.0%	23.5%	2.6%	2.9%
Chambersburg	11,400	25.7%	20.2%	29.5%	18.7%	29.8%	3.6%	2.1%
Gettysburg	10,309	24.5%	18.9%	36.4%	23.4%	14.8%	4.1%	1.3%
Harrisburg	9,286	23.9%	21.9%	47.2%	11.1%	19.5%	4.3%	2.0%
Lykens	3,715	24.4%	20.5%	19.7%	22.8%	36.3%	3.5%	1.7%
Newport	3,728	36.3%	20.5%	23.6%	18.6%	23.7%	4.5%	1.4%
Troop T								
Bowmansville	4,850	58.5%	22.6%	12.3%	7.2%	28.4%	2.4%	1.5%
Everett	5,388	73.4%	22.8%	19.9%	5.9%	19.8%	2.2%	3.8%
Gibsonia	5,878	54.0%	19.3%	17.7%	13.4%	39.6%	2.7%	1.0%
Highspire	79	57.0%	19.0%	25.3%	13.9%	5.1%	5.1%	0.0%
Jefferson Hills	4,736	74.1%	21.4%	15.5%	7.9%	12.1%	2.3%	6.5%
King of Prussia	5,722	44.8%	23.0%	14.7%	20.2%	29.7%	5.5%	2.5%
New Stanton	4,414	60.4%	21.4%	6.4%	21.3%	14.6%	2.3%	2.1%
Newville	5,797	74.7%	22.7%	12.9%	4.9%	16.1%	2.5%	1.9%
Pocono	5,395	59.4%	23.8%	25.2%	2.6%	17.3%	1.5%	1.3%
Somerset (T)	4,314	67.4%	23.0%	7.8%	5.8%	23.6%	1.9%	1.5%

Table A.5. Area III Reason for Stop by Station, Jan - Dec 2024

	Total # of Stops	Speeding	Avg. Amount Over Limit (MPH)	Other Moving Violation	Equipment/ Inspection	Registration	License	Other
Troop F								
Coudersport	4,696	37.0%	16.8%	20.9%	24.2%	17.4%	2.1%	1.1%
Emporium	1,043	48.0%	18.5%	8.7%	12.6%	31.0%	3.0%	1.3%
Lamar	3,901	34.5%	19.7%	29.9%	21.1%	20.4%	2.2%	0.9%
Mansfield	3,348	41.7%	17.5%	19.0%	17.6%	23.0%	1.4%	0.6%
Milton	6,786	42.6%	19.3%	21.5%	14.5%	23.2%	4.4%	1.1%
Montoursville	6,099	44.1%	20.2%	24.4%	12.9%	21.5%	3.0%	1.3%
Selinsgrove	3,964	48.6%	23.3%	17.5%	15.7%	22.1%	3.1%	0.9%
Stonington	2,614	31.5%	18.3%	33.0%	12.7%	21.8%	3.3%	0.7%
Troop N								
Bloomsburg	2,779	54.0%	19.4%	18.8%	14.4%	16.9%	3.2%	1.0%
Fern Ridge	3,275	51.6%	22.2%	21.3%	14.2%	15.1%	2.8%	2.3%
Hazleton	6,950	34.4%	22.2%	39.6%	12.7%	14.4%	5.3%	2.5%
Lehighton	3,277	32.1%	21.5%	29.8%	18.5%	20.7%	4.8%	2.5%
Stroudsburg	8,848	29.8%	24.2%	29.5%	18.7%	22.7%	5.0%	2.8%
Troop P								
Laporte	1,647	31.6%	18.7%	12.0%	24.0%	29.4%	6.4%	1.9%
Shickshinny	1,401	39.3%	22.3%	8.3%	17.1%	31.7%	9.0%	1.3%
Towanda	3,184	20.6%	19.6%	23.8%	27.8%	26.0%	5.9%	1.2%
Tunkhannock	2,069	35.4%	20.7%	17.2%	19.9%	27.7%	3.0%	1.3%
Wilkes-Barre	4,154	27.2%	24.8%	32.5%	21.8%	20.6%	7.5%	1.9%
Troop R								
Blooming Grove	3,188	33.8%	19.8%	37.5%	12.3%	17.5%	5.1%	2.2%
Dunmore	3,756	45.3%	23.0%	20.7%	19.0%	20.0%	5.8%	1.1%
Gibson	1,774	39.0%	21.0%	22.3%	31.3%	15.9%	6.0%	1.4%
Honesdale	2,053	22.8%	22.3%	11.3%	44.7%	24.3%	3.4%	1.8%

Table A.5. Area IV Reason for Stop by Station, Jan - Dec 2024

	Total # of Stops	Speeding	Avg. Amount Over Limit (MPH)	Other Moving Violation	Equipment/ Inspection	Registration	License	Other
Troop J								
Avondale	8,289	18.3%	23.6%	46.4%	15.4%	22.5%	4.2%	2.1%
Embreeville	7,489	30.6%	26.5%	37.7%	17.8%	20.4%	5.0%	2.5%
Lancaster	10,528	19.8%	20.9%	31.9%	24.2%	25.7%	5.8%	1.8%
York	11,559	18.9%	21.2%	43.4%	18.6%	22.8%	4.6%	1.6%
Troop K								
Media	12,255	15.9%	26.1%	55.2%	9.0%	24.3%	4.3%	2.1%
Philadelphia	8,430	8.5%	28.4%	50.1%	10.0%	37.3%	4.4%	2.5%
Skippack	3,528	30.4%	26.1%	29.4%	14.5%	31.2%	5.3%	1.7%
Troop L								
Frackville	3,872	39.5%	21.4%	19.0%	21.3%	23.0%	6.6%	2.6%
Hamburg	2,423	53.9%	21.7%	20.0%	13.1%	15.8%	3.2%	1.7%
Jonestown	4,806	46.3%	20.3%	28.3%	13.9%	11.6%	3.7%	1.0%
Reading	5,599	40.0%	25.9%	26.7%	18.6%	16.1%	7.6%	1.8%
Schuylkill Haven	4,307	31.6%	20.6%	20.3%	21.7%	25.9%	9.2%	1.3%
Troop M								
Belfast	2,646	42.5%	25.2%	25.2%	18.1%	16.9%	4.8%	3.0%
Bethlehem	6,917	19.2%	27.9%	48.0%	13.7%	19.3%	7.7%	2.1%
Dublin	3,043	30.2%	29.7%	28.9%	22.5%	22.6%	10.2%	2.2%
Fogelsville	6,488	15.6%	24.5%	52.0%	13.8%	22.4%	7.6%	1.3%
Trevose	3,250	34.5%	33.7%	40.7%	14.3%	21.9%	2.6%	2.1%
Specialized Units								
SHIELD	3,930	14.4%	14.4%	43.2%	44.3%	14.5%	1.7%	2.9%
Canine	913	4.7%	17.9%	59.8%	31.7%	13.3%	3.4%	3.0%

Table A.6. Area I Characteristics of Drivers Stopped by Station, Jan - Dec 2024

		Age	Gender	Behavior				Residency
	Total # of Stops	Average (years)	Male	Civil	Dis-respectful	Non-compliant	Verbal or Phys Resistant	In-State
Troop B								
Belle Vernon	4,892	39.8	66.8%	97.5%	1.6%	0.4%	1.0%	92.0%
Pittsburgh	6,309	39.2	65.0%	98.2%	0.9%	0.3%	0.9%	92.1%
Uniontown	8,157	39.7	61.8%	97.5%	1.2%	0.6%	1.4%	94.4%
Washington	5,466	40.3	64.5%	98.6%	0.7%	0.3%	0.8%	87.2%
Waynesburg	2,151	40.1	62.9%	99.3%	0.3%	0.2%	0.3%	86.6%
Troop C								
Clarion	4,121	40.4	67.2%	98.9%	0.7%	0.1%	0.5%	77.9%
Clearfield	5,046	39.9	69.5%	99.2%	0.5%	0.1%	0.3%	70.4%
Dubois	3,582	39.6	67.6%	99.1%	0.3%	0.3%	0.4%	70.0%
Lewis Run	4,638	40.7	67.2%	98.1%	1.1%	0.6%	0.6%	79.6%
Marienville	3,821	44.2	71.5%	98.8%	0.7%	0.2%	0.6%	90.2%
Punxsutawney	3,082	41.0	67.3%	97.9%	1.2%	0.4%	1.0%	95.0%
Ridgway	3,283	41.1	66.2%	99.4%	0.5%	0.0%	0.2%	76.3%
Troop D								
Beaver	3,701	40.1	60.8%	98.4%	1.1%	0.3%	0.5%	91.6%
Butler	5,081	39.0	64.4%	98.8%	0.7%	0.2%	0.4%	94.2%
Kittanning	6,272	38.0	67.1%	98.6%	0.8%	0.4%	0.6%	92.0%
Mercer	3,419	38.7	61.4%	98.9%	0.5%	0.3%	0.6%	85.5%
New Castle	2,094	40.3	60.7%	98.4%	0.5%	0.1%	1.1%	91.1%
Troop E								
Corry	2,311	41.6	66.0%	99.0%	0.7%	0.2%	0.3%	94.4%
Erie	7,631	39.0	63.9%	98.4%	0.6%	0.3%	1.1%	84.8%
Franklin	2,241	39.4	65.1%	98.3%	0.5%	0.6%	1.1%	90.5%
Girard	7,439	39.5	62.5%	98.5%	0.9%	0.3%	0.6%	85.9%
Meadville	3,419	40.0	63.2%	98.9%	0.5%	0.2%	0.6%	87.4%
Warren	2,637	41.6	65.1%	99.3%	0.5%	0.2%	0.2%	87.9%

Table A.6. Area II Characteristics of Drivers Stopped by Station, Jan - Dec 2024

		Age	Gender	Behavior				Residency
	Total # of Stops	Average (years)	Male	Civil	Dis-respectful	Non-compliant	Verbal or Phys Resistant	In-State
Troop A								
Ebensburg	2,343	38.0	63.7%	98.6%	0.4%	0.3%	0.8%	90.5%
Greensburg	6,057	40.8	61.6%	98.5%	0.9%	0.3%	0.6%	96.7%
Indiana	4,649	38.4	62.7%	99.3%	0.4%	0.2%	0.2%	90.9%
Kiski Valley	1,886	39.6	67.5%	99.1%	0.6%	0.2%	0.4%	95.7%
Somerset (A)	2,706	41.1	64.6%	98.3%	1.0%	0.4%	0.7%	95.2%
Troop G								
Bedford	4,970	40.0	65.9%	98.8%	0.7%	0.3%	0.6%	79.0%
Hollidaysburg	3,142	38.8	60.9%	98.8%	0.6%	0.1%	0.7%	92.0%
Huntingdon	4,018	41.5	61.6%	99.2%	0.5%	0.1%	0.3%	95.4%
Lewistown	5,009	38.7	63.4%	98.8%	0.7%	0.2%	0.5%	92.1%
McConnellsburg	2,630	39.0	70.9%	97.9%	0.7%	0.3%	1.3%	60.7%
Rockview	6,683	38.2	64.7%	99.0%	0.5%	0.1%	0.5%	85.4%
Troop H								
Carlisle	11,472	38.8	69.2%	98.5%	0.7%	0.3%	0.8%	82.4%
Chambersburg	11,400	37.9	66.4%	98.6%	0.6%	0.3%	0.8%	82.4%
Gettysburg	10,309	38.0	66.4%	97.4%	2.1%	0.6%	0.4%	73.1%
Harrisburg	9,286	38.9	70.1%	97.0%	1.5%	0.8%	1.5%	80.0%
Lykens	3,715	39.8	62.0%	97.8%	1.2%	0.3%	1.5%	96.3%
Newport	3,728	38.8	64.1%	98.3%	1.0%	0.5%	1.0%	90.2%
Troop T								
Bowmansville	4,850	37.6	68.1%	98.8%	0.4%	0.2%	0.7%	80.8%
Everett	5,388	38.1	73.9%	98.5%	0.6%	0.3%	0.9%	51.6%
Gibsonia	5,878	40.2	67.4%	99.1%	0.4%	0.2%	0.6%	76.2%
Highspire	79	39.3	70.9%	97.5%	2.5%	0.0%	0.0%	81.0%
Jefferson Hills	4,736	39.2	65.2%	99.4%	0.4%	0.1%	0.3%	74.5%
King of Prussia	5,722	38.6	68.6%	97.8%	0.7%	0.2%	1.6%	83.8%
New Stanton	4,414	39.0	66.6%	99.1%	0.5%	0.1%	0.5%	82.1%
Newville	5,797	38.2	71.0%	98.9%	0.3%	0.2%	0.9%	62.4%
Pocono	5,395	38.0	68.0%	99.5%	0.4%	0.1%	0.1%	77.9%
Somerset (T)	4,314	39.4	71.3%	98.9%	0.3%	0.2%	0.8%	55.8%

Table A.6. Area III Characteristics of Drivers Stopped by Station, Jan - Dec 2024

		Age	Gender	Behavior				Residency
	Total # of Stops	Average (years)	Male	Civil	Dis-respectful	Non-compliant	Verbal or Phys Resistant	In-State
Troop F								
Coudersport	4,696	43.3	68.2%	99.4%	0.4%	0.1%	0.1%	86.4%
Emporium	1,043	42.2	69.2%	99.6%	0.2%	0.2%	0.0%	90.7%
Lamar	3,901	37.9	70.4%	99.0%	0.6%	0.2%	0.4%	66.0%
Mansfield	3,348	39.5	64.1%	99.4%	0.4%	0.1%	0.1%	68.0%
Milton	6,786	38.7	66.5%	99.3%	0.4%	0.2%	0.4%	80.5%
Montoursville	6,099	39.0	62.4%	99.0%	0.5%	0.2%	0.5%	90.2%
Selinsgrove	3,964	39.2	65.0%	99.1%	0.5%	0.0%	0.4%	81.7%
Stonington	2,614	40.1	59.1%	99.1%	0.3%	0.2%	0.7%	97.7%
Troop N								
Bloomsburg	2,779	37.5	66.2%	99.1%	0.5%	0.2%	0.4%	75.6%
Fern Ridge	3,275	37.7	71.2%	98.8%	0.5%	0.2%	0.6%	63.5%
Hazleton	6,950	37.2	71.3%	98.1%	1.0%	0.6%	1.0%	81.6%
Lehighton	3,277	38.6	68.1%	97.4%	1.6%	0.5%	1.0%	92.1%
Stroudsburg	8,848	39.6	66.9%	97.9%	1.2%	0.4%	0.8%	80.6%
Troop P								
Laporte	1,647	41.6	66.9%	98.0%	1.3%	0.7%	1.2%	91.9%
Shickshinny	1,401	40.0	61.3%	98.8%	0.6%	0.1%	0.6%	97.1%
Towanda	3,184	39.1	64.2%	99.1%	0.5%	0.2%	0.4%	89.8%
Tunkhannock	2,069	41.2	68.1%	98.8%	0.7%	0.2%	0.3%	92.7%
Wilkes-Barre	4,154	39.6	70.8%	98.1%	0.9%	0.2%	1.2%	87.1%
Troop R								
Blooming Grove	3,188	41.8	66.9%	97.4%	1.6%	0.7%	1.1%	67.3%
Dunmore	3,756	38.1	65.3%	98.3%	1.1%	0.2%	0.7%	84.9%
Gibson	1,774	39.6	70.5%	97.9%	1.1%	0.5%	1.4%	59.1%
Honesdale	2,053	41.1	67.5%	99.1%	0.7%	0.2%	0.1%	92.5%

Table A.6. Area IV Characteristics of Drivers Stopped by Station, Jan - Dec 2024

		Age	Gender	Behavior				Residency
	Total # of Stops	Average (years)	Male	Civil	Dis-respectful	Non-compliant	Verbal or Phys Resistant	In-State
Troop J								
Avondale	8,289	38.2	69.0%	98.5%	0.7%	0.3%	0.7%	78.9%
Embreeville	7,489	38.0	66.7%	97.9%	0.8%	0.5%	1.5%	90.6%
Lancaster	10,528	38.3	69.5%	98.4%	0.9%	0.3%	0.8%	91.5%
York	11,559	37.9	65.2%	97.9%	1.0%	0.5%	1.3%	80.0%
Troop K								
Media	12,255	38.2	69.4%	98.4%	0.9%	0.4%	0.7%	77.9%
Philadelphia	8,430	36.8	72.7%	97.3%	1.4%	0.8%	1.3%	88.1%
Skippack	3,528	38.3	67.4%	97.6%	1.1%	0.5%	1.4%	95.0%
Troop L								
Frackville	3,872	39.6	67.0%	98.4%	1.1%	0.3%	0.6%	85.4%
Hamburg	2,423	38.7	66.5%	98.2%	0.6%	0.3%	1.0%	83.0%
Jonestown	4,806	38.1	69.0%	98.7%	0.7%	0.3%	0.6%	80.8%
Reading	5,599	36.4	67.3%	98.2%	0.8%	0.4%	1.1%	92.6%
Schuylkill Haven	4,307	40.0	64.6%	98.5%	0.7%	0.3%	0.9%	95.6%
Troop M								
Belfast	2,646	38.1	69.7%	97.4%	0.8%	0.4%	1.9%	77.5%
Bethlehem	6,917	36.9	69.2%	96.9%	1.2%	1.2%	1.9%	91.0%
Dublin	3,043	37.6	68.5%	97.5%	1.2%	0.5%	1.6%	93.6%
Fogelsville	6,488	38.0	69.4%	98.4%	0.6%	0.4%	0.9%	83.1%
Trevose	3,250	36.7	73.3%	98.2%	0.8%	0.7%	0.8%	74.5%
Specialized Units								
SHIELD	3,930	39.0	85.8%	99.2%	0.4%	0.3%	0.4%	29.7%
Canine	913	37.7	80.0%	96.1%	1.6%	0.5%	2.8%	49.0%

Table A.7. Area I Race and Ethnicity of Drivers Stopped by Station, Jan - Dec 2024

	Total # of Stops	White	White (not Hispanic)	Black	Hispanic (any race)	Hispanic (White)	Asian/ Pacific Islander	Amer. Indian or Alask. Nat.	Two or more races	Unknown race & ethnicity
Troop B										
Belle Vernon	4,892	69.4%	67.0%	18.3%	3.1%	2.5%	1.1%	0.2%	0.0%	10.9%
Pittsburgh	6,309	65.3%	63.6%	20.7%	2.8%	2.0%	2.1%	0.3%	0.0%	11.3%
Uniontown	8,157	87.6%	86.7%	11.2%	1.2%	1.0%	0.3%	0.1%	0.0%	0.6%
Washington	5,466	82.9%	79.9%	14.1%	3.3%	3.1%	1.8%	0.1%	0.0%	0.9%
Waynesburg	2,151	93.1%	92.3%	4.6%	1.0%	0.9%	0.3%	0.0%	0.0%	1.8%
Troop C										
Clarion	4,121	88.5%	84.9%	6.8%	4.3%	3.9%	1.5%	0.3%	0.0%	2.5%
Clearfield	5,046	87.9%	84.8%	5.0%	3.7%	3.3%	1.9%	0.5%	0.0%	4.4%
Dubois	3,582	86.4%	81.6%	7.2%	5.6%	5.2%	2.0%	0.2%	0.0%	3.7%
Lewis Run	4,638	91.9%	90.5%	3.7%	1.7%	1.4%	1.3%	0.4%	0.1%	2.6%
Marienville	3,821	96.6%	95.6%	1.9%	1.2%	1.2%	0.4%	0.1%	0.0%	0.9%
Punxsutawney	3,082	97.6%	96.9%	1.7%	0.9%	0.7%	0.4%	0.1%	0.0%	0.3%
Ridgway	3,283	89.4%	88.0%	3.7%	1.6%	1.5%	3.1%	0.5%	0.2%	3.1%
Troop D										
Beaver	3,701	79.3%	77.5%	18.3%	2.2%	1.9%	0.4%	0.1%	0.0%	1.8%
Butler	5,081	91.4%	90.1%	5.1%	1.4%	1.3%	0.7%	0.1%	0.0%	2.7%
Kittanning	6,272	78.1%	76.2%	18.0%	2.1%	1.9%	0.7%	0.2%	0.0%	2.9%
Mercer	3,419	86.3%	84.3%	8.8%	2.1%	2.0%	2.0%	0.2%	0.0%	2.7%
New Castle	2,094	86.1%	84.0%	12.4%	2.3%	2.2%	0.5%	0.0%	0.0%	0.8%
Troop E										
Corry	2,311	97.7%	97.1%	1.8%	0.6%	0.6%	0.2%	0.0%	0.0%	0.3%
Erie	7,631	80.2%	75.4%	16.0%	5.3%	5.0%	2.3%	0.4%	0.1%	0.9%
Franklin	2,241	92.3%	91.0%	5.0%	1.9%	1.7%	1.0%	0.2%	0.0%	1.0%
Girard	7,439	85.7%	82.8%	10.0%	3.3%	3.0%	3.1%	0.3%	0.0%	0.8%
Meadville	3,419	89.8%	87.7%	7.6%	2.5%	2.2%	1.0%	0.2%	0.0%	1.2%
Warren	2,637	96.9%	96.4%	1.9%	0.6%	0.6%	0.2%	0.1%	0.0%	0.7%

Table A.7. Area II Race and Ethnicity of Drivers Stopped by Station, Jan - Dec 2024

	Total # of Stops	White	White (not Hispanic)	Black	Hispanic (any race)	Hispanic (White)	Asian/ Pacific Islander	Amer. Indian or Alaskan Native	Two or more races	Unknown race & ethnicity
Troop A										
Ebensburg	2,343	88.5%	86.4%	8.7%	2.1%	2.0%	1.3%	0.1%	0.0%	1.5%
Greensburg	6,057	90.7%	89.2%	7.9%	1.7%	1.6%	0.5%	0.2%	0.0%	0.6%
Indiana	4,649	89.4%	88.1%	9.2%	1.4%	1.3%	0.6%	0.2%	0.0%	0.6%
Kiski Valley	1,886	91.4%	89.9%	6.4%	2.3%	1.7%	1.0%	0.3%	0.0%	0.6%
Somerset (A)	2,706	95.8%	94.8%	2.6%	1.2%	1.1%	0.5%	0.2%	0.0%	0.7%
Troop G										
Bedford	4,970	89.6%	87.5%	6.3%	2.3%	2.2%	2.1%	0.8%	0.0%	1.1%
Hollidaysburg	3,142	90.2%	88.7%	7.2%	1.6%	1.5%	1.1%	0.4%	0.0%	1.1%
Huntingdon	4,018	90.8%	90.0%	2.8%	0.9%	0.8%	0.5%	0.1%	0.0%	5.7%
Lewistown	5,009	90.7%	86.5%	6.2%	4.8%	4.3%	2.0%	0.4%	0.0%	0.5%
McConnellsburg	2,630	80.8%	75.0%	14.2%	6.2%	6.0%	2.3%	0.4%	0.0%	2.1%
Rockview	6,683	87.7%	84.0%	7.9%	4.1%	3.7%	3.0%	0.4%	0.0%	0.9%
Troop H										
Carlisle	11,472	78.4%	70.0%	17.1%	9.6%	8.8%	2.9%	0.7%	0.0%	0.5%
Chambersburg	11,400	82.9%	71.5%	14.5%	12.8%	11.5%	1.3%	0.3%	0.0%	0.7%
Gettysburg	10,309	84.9%	73.7%	12.2%	11.7%	11.2%	1.5%	0.5%	0.0%	0.8%
Harrisburg	9,286	64.0%	51.4%	28.3%	14.4%	12.9%	4.1%	1.2%	0.0%	2.1%
Lykens	3,715	92.1%	88.4%	6.1%	3.9%	3.7%	1.1%	0.1%	0.0%	0.6%
Newport	3,728	87.1%	83.4%	8.5%	4.3%	3.9%	1.6%	0.4%	0.0%	2.1%
Troop T										
Bowmansville	4,850	72.7%	62.5%	19.9%	12.3%	10.4%	3.6%	0.8%	0.0%	2.7%
Everett	5,388	69.9%	63.4%	18.8%	7.9%	6.6%	6.0%	0.4%	0.1%	4.6%
Gibsonia	5,878	83.8%	81.1%	11.5%	3.4%	2.9%	2.4%	0.2%	0.0%	1.9%
Highspire	79	69.6%	64.6%	21.5%	7.6%	5.1%	3.8%	0.0%	0.0%	5.1%
Jefferson Hills	4,736	83.1%	81.4%	9.3%	2.1%	1.8%	1.2%	0.0%	0.0%	6.2%
King of Prussia	5,722	67.2%	60.1%	24.8%	11.2%	7.7%	3.5%	1.0%	0.0%	2.9%
New Stanton	4,414	86.6%	84.2%	10.2%	2.6%	2.4%	1.0%	0.2%	0.0%	2.0%
Newville	5,797	74.4%	67.8%	18.0%	7.6%	6.7%	4.3%	0.6%	0.1%	2.5%
Pocono	5,395	78.0%	67.1%	17.5%	12.8%	11.3%	2.7%	0.7%	0.0%	0.8%
Somerset (T)	4,314	71.6%	66.1%	17.1%	7.1%	5.7%	4.8%	0.6%	0.8%	4.9%

Table A.7. Area III Race and Ethnicity of Drivers Stopped by Station, Jan - Dec 2024

	Total # of Stops	White	White (not Hispanic)	Black	Hispanic (any race)	Hispanic (White)	Asian/ Pacific Islander	Amer. Indian or Alaskan Native	Two or more races	Unknown race & ethnicity
Troop F										
Coudersport	4,696	96.0%	95.1%	1.2%	1.3%	1.1%	0.8%	0.0%	0.0%	1.9%
Emporium	1,043	96.2%	94.5%	2.6%	2.1%	1.8%	0.5%	0.1%	0.0%	0.5%
Lamar	3,901	81.4%	75.0%	13.7%	8.5%	6.7%	1.6%	0.3%	0.0%	2.7%
Mansfield	3,348	83.7%	80.7%	6.7%	3.4%	3.1%	2.3%	1.3%	0.0%	5.9%
Milton	6,786	86.0%	79.9%	10.0%	6.5%	6.2%	1.5%	0.6%	0.0%	1.8%
Montoursville	6,099	86.3%	83.4%	11.4%	3.1%	2.9%	1.0%	0.3%	0.0%	1.0%
Selinsgrove	3,964	87.6%	82.8%	8.3%	5.7%	5.2%	1.7%	0.4%	0.0%	1.6%
Stonington	2,614	94.3%	89.6%	4.4%	5.3%	5.0%	0.3%	0.0%	0.0%	0.7%
Troop N										
Bloomsburg	2,779	80.5%	72.1%	10.7%	9.8%	8.6%	3.2%	0.3%	0.0%	5.2%
Fern Ridge	3,275	78.3%	60.7%	17.2%	19.9%	17.7%	2.4%	0.5%	0.0%	1.6%
Hazleton	6,950	81.7%	45.7%	11.8%	42.6%	37.0%	1.6%	0.5%	0.0%	3.4%
Lehighton	3,277	87.2%	75.8%	8.9%	13.3%	11.7%	0.5%	0.1%	0.0%	2.9%
Stroudsburg	8,848	70.9%	54.0%	23.2%	18.7%	17.0%	2.5%	0.4%	0.0%	2.8%
Troop P										
Laporte	1,647	92.7%	88.6%	4.9%	5.4%	4.2%	0.7%	0.1%	0.1%	1.5%
Shickshinny	1,401	90.6%	83.2%	7.9%	9.0%	7.6%	0.4%	0.2%	0.0%	0.6%
Towanda	3,184	94.4%	92.2%	3.9%	2.6%	2.4%	0.4%	0.1%	0.0%	0.9%
Tunkhannock	2,069	94.2%	90.5%	3.9%	4.0%	3.7%	1.0%	0.1%	0.0%	0.7%
Wilkes-Barre	4,154	78.9%	67.7%	15.8%	14.6%	11.5%	0.5%	0.1%	0.0%	4.4%
Troop R										
Blooming Grove	3,188	86.3%	74.5%	9.4%	12.8%	11.9%	1.1%	0.0%	0.0%	3.1%
Dunmore	3,756	83.4%	70.1%	13.7%	14.3%	13.4%	1.6%	0.2%	0.0%	1.1%
Gibson	1,774	78.1%	69.3%	14.0%	10.1%	9.0%	2.9%	0.5%	0.0%	4.3%
Honesdale	2,053	94.4%	90.7%	3.9%	4.1%	3.8%	0.6%	0.2%	0.0%	0.8%

Table A.7. Area IV Race and Ethnicity of Drivers Stopped by Station, Jan - Dec 2024

	Total # of Stops	White	White (not Hispanic)	Black	Hispanic (any race)	Hispanic (White)	Asian/ Pacific Islander	Amer. Indian or Alaskan Native	Two or more races	Unknown race & ethnicity
Troop J										
Avondale	8,289	82.3%	59.3%	15.0%	23.2%	23.0%	1.9%	0.3%	0.0%	0.5%
Embreeville	7,489	67.4%	54.2%	25.9%	14.1%	13.3%	3.9%	0.9%	0.0%	1.8%
Lancaster	10,528	81.3%	64.8%	16.2%	17.9%	16.6%	1.7%	0.3%	0.0%	0.4%
York	11,559	68.5%	58.7%	27.8%	12.1%	10.1%	1.5%	0.5%	0.0%	1.3%
Troop K										
Media	12,255	48.3%	41.0%	45.1%	8.4%	7.5%	2.8%	0.5%	0.0%	3.0%
Philadelphia	8,430	39.3%	27.5%	51.3%	14.9%	12.4%	2.7%	0.6%	0.0%	5.5%
Skippack	3,528	69.8%	59.9%	24.0%	10.6%	9.9%	3.0%	0.6%	0.0%	2.5%
Troop L										
Frackville	3,872	87.5%	67.4%	10.4%	23.5%	20.2%	0.9%	0.3%	0.0%	0.7%
Hamburg	2,423	80.1%	62.0%	10.1%	21.9%	18.4%	1.5%	0.2%	0.0%	7.8%
Jonestown	4,806	84.1%	66.3%	12.4%	19.3%	17.8%	1.4%	0.4%	0.0%	1.7%
Reading	5,599	81.7%	51.0%	14.4%	34.9%	31.2%	1.6%	0.1%	0.0%	1.7%
Schuylkill Haven	4,307	88.2%	78.4%	9.1%	10.9%	9.8%	1.0%	0.1%	0.0%	1.5%
Troop M										
Belfast	2,646	75.0%	58.1%	20.0%	19.3%	17.1%	2.8%	0.1%	0.1%	1.9%
Bethlehem	6,917	70.8%	41.2%	20.0%	34.7%	29.8%	2.1%	0.4%	0.0%	6.6%
Dublin	3,043	77.7%	63.3%	12.5%	16.4%	14.5%	2.9%	0.2%	0.0%	6.6%
Fogelsville	6,488	73.5%	44.2%	18.9%	34.7%	29.6%	2.0%	0.4%	0.0%	5.0%
Trevose	3,250	62.6%	49.0%	28.6%	15.8%	13.8%	5.9%	0.5%	0.0%	2.2%
Specialized Units										
SHIELD	3,930	70.1%	42.2%	17.4%	30.2%	27.9%	10.6%	1.3%	0.0%	0.6%
Canine	913	64.2%	47.1%	29.5%	18.0%	17.2%	4.4%	0.3%	0.1%	1.4%

Table A.8. Veil of Darkness Binary Logistic Regressions Predicting Stops of Black and Hispanic Drivers

	Model A: Stops of Black Drivers			Model B: Stops of Hispanic Drivers		
	Coefficient	**Stnd. Error**	**Odds Ratio**	**Coefficient**	**Stnd. Error**	**Odds Ratio**
Intercept	-2.77*	0.15	--	-4.42*	0.22	--
Daylight	**0.19***	**0.03**	**1.21**	**0.10***	**0.04**	**1.10**
Troop B	0.88*	0.09	2.41	0.19	0.19	--
Troop C	-0.60*	0.11	0.55	0.28	0.18	--
Troop D	0.72*	0.09	2.05	-0.05	0.20	--
Troop E	0.08	0.10	--	0.63	0.17	1.88
Troop F	0.19	0.09	--	0.88	0.17	2.41
Troop G	-0.17	0.11	--	0.57	0.18	--
Troop H	0.60*	0.09	1.82	1.83	0.16	6.21
Troop J	1.17*	0.09	3.22	2.31	0.16	10.07
Troop K	2.10*	0.09	8.15	1.82	0.17	6.20
Troop L	0.50*	0.10	1.66	2.81	0.16	16.58
Troop M	1.14*	0.09	3.11	3.03	0.16	20.59
Troop N	0.96*	0.09	2.60	2.79	0.16	16.36
Troop P	0.27	0.11	--	1.22	0.18	3.40
Troop R	0.49*	0.11	1.64	2.26	0.17	9.62
Troop T	0.69*	0.09	2.00	1.40	0.16	4.05
Monday	0.06	0.04	--	0.03	0.05	--
Tuesday	0.01	0.04	--	-0.02	0.05	--
Wednesday	0.05	0.04	--	-0.08	0.05	--
Thursday	0.07	0.04	--	-0.06	0.05	--
Saturday	0.12	0.04	--	0.02	0.05	--
Sunday	0.10	0.04	--	0.03	0.05	--
Trooper Assigned to Patrol	-0.16	0.09	--	0.25	0.12	--
Interstate	0.63*	0.03	1.88	0.30	0.03	1.35
Time Spline 1	-0.03	0.08	--	0.07	0.10	--
Time Spline 2	0.04	0.11	--	-0.10	0.13	--
Time Spline 3	0.09	0.10	--	0.17	0.11	--
Time Spline 4	0.19	0.09	--	-0.11	0.11	--
Time Spline 5	0.06	0.21	--	-0.07	0.23	--
Time Spline 6	0.32	0.11	--	-0.41	0.15	--

NOTE: * = $p < 0.001$ Only odds ratios for statistically significant estimates are presented.
Odds Ratios for negative coefficients are calculated as 1/Exp(B), which equates to a value > 1.0, which we include as a negative odds ratio (-). This odds ratio can be interpreted as 'less likely' with the binary outcome.
Troop A is the reference category for "Troop." Friday is the reference category for day of the week.

Section 4 Supplemental Tables

Table A.9. Searches and Search Reasons by Department, Area, and Troop 2024

	% of Stops Resulting in Any Search	Total # of All Searches	Incident to Arrest	Inventory	Officer Safety (Terry)	Plain View	Prob Cause + Exigency	Search Warrant	Written Consent	Verbal Consent
PSP Dept.	4.5%	19,522	73.5%	11.6%	7.9%	5.1%	0.6%	3.1%	5.5%	36.1%
AREA I	4.9%	4,938	71.5%	1.6%	7.6%	7.2%	0.9%	3.0%	4.8%	43.2%
Troop B	5.2%	1,408	65.4%	2.9%	6.1%	8.3%	1.0%	3.3%	2.6%	48.4%
Troop C	4.1%	1,133	70.7%	1.8%	9.4%	9.8%	1.7%	2.7%	8.8%	37.9%
Troop D	6.7%	1,381	77.8%	0.8%	7.3%	5.0%	0.4%	2.8%	2.0%	46.1%
Troop E	3.9%	1,016	72.3%	0.9%	8.2%	5.8%	0.6%	3.0%	7.1%	37.8%
AREA II	3.3%	4,584	79.1%	2.5%	8.5%	5.2%	0.8%	2.9%	2.6%	35.7%
Troop A	4.2%	743	80.9%	2.0%	7.7%	6.6%	0.4%	2.2%	2.8%	27.1%
Troop G	3.4%	889	78.5%	1.7%	6.4%	4.5%	0.9%	3.6%	2.4%	37.8%
Troop H	5.5%	2,769	79.5%	2.6%	9.3%	4.5%	0.8%	3.0%	2.7%	38.1%
Troop T	0.4%	183	69.9%	8.2%	9.3%	13.1%	2.2%	1.6%	1.6%	24.0%
AREA III	4.3%	3,507	79.9%	4.9%	5.7%	4.2%	0.2%	2.4%	2.5%	32.4%
Troop F	2.9%	946	69.9%	1.8%	5.3%	3.7%	0.3%	2.4%	4.1%	36.5%
Troop N	7.1%	1,791	89.0%	4.9%	4.5%	3.8%	0.0%	2.2%	1.4%	25.9%
Troop P	2.6%	326	76.1%	7.4%	14.7%	7.4%	1.2%	3.1%	4.3%	36.2%
Troop R	4.1%	444	67.3%	9.7%	4.7%	4.5%	0.2%	2.5%	1.8%	47.3%
AREA IV	5.5%	5,801	74.0%	32.4%	9.8%	4.2%	0.4%	3.8%	6.9%	27.6%
Troop J	5.2%	1,980	78.4%	38.9%	7.0%	3.9%	0.2%	4.1%	6.9%	29.7%
Troop K	6.3%	1,531	67.0%	44.2%	12.5%	3.3%	0.7%	6.1%	2.7%	26.3%
Troop L	4.6%	967	74.1%	6.9%	12.3%	5.5%	0.9%	2.3%	14.2%	31.5%
Troop M	5.9%	1,323	75.5%	27.7%	9.0%	4.6%	0.0%	1.7%	6.6%	22.9%

Table A.10. Area I Search Reasons by Station, 2024

	% of Stops Resulting in Any Search	Total # of All Searches	Incident to Arrest	Inventory	Officer Safety (Terry)	Plain View	Prob Cause + Exigency	Search Warrant	Written Consent	Verbal Consent
Troop B										
Belle Vernon	4.0%	196	75.0%	7.7%	7.1%	8.2%	0.5%	5.6%	1.5%	54.1%
Pittsburgh	1.9%	121	67.8%	9.9%	2.5%	17.4%	2.5%	0.8%	2.5%	27.3%
Uniontown	9.0%	734	63.8%	1.2%	6.5%	6.5%	0.4%	3.0%	3.0%	53.0%
Washington	6.1%	331	64.7%	0.9%	6.3%	9.4%	1.5%	3.3%	2.4%	41.4%
Waynesburg	1.2%	26	38.5%	7.7%	0.0%	3.8%	7.7%	3.8%	3.8%	65.4%
Troop C										
Clarion	2.3%	94	97.9%	0.0%	5.3%	6.4%	0.0%	0.0%	0.0%	12.8%
Clearfield	3.0%	153	89.5%	2.0%	8.5%	7.8%	0.7%	0.0%	1.3%	24.2%
Dubois	2.8%	101	83.2%	1.0%	1.0%	4.0%	0.0%	5.0%	1.0%	25.7%
Lewis Run	10.0%	463	46.9%	0.2%	8.4%	14.7%	0.2%	3.2%	17.1%	53.6%
Marienville	3.1%	118	87.3%	12.7%	19.5%	11.0%	13.6%	2.5%	5.9%	34.7%
Punxsutawney	4.7%	146	84.9%	0.0%	14.4%	4.8%	0.7%	4.1%	6.2%	35.6%
Ridgway	1.8%	58	75.9%	0.0%	6.9%	1.7%	0.0%	3.4%	3.4%	22.4%
Troop D										
Beaver	4.0%	148	68.9%	1.4%	12.2%	4.7%	1.4%	2.0%	2.7%	34.5%
Butler	5.9%	301	79.7%	1.0%	11.3%	5.0%	0.3%	2.0%	0.7%	34.6%
Kittanning	9.9%	620	77.4%	0.3%	1.9%	5.5%	0.3%	4.4%	2.4%	50.3%
Mercer	3.0%	104	83.7%	1.0%	4.8%	4.8%	0.0%	1.0%	3.8%	53.8%
New Castle	9.9%	208	79.8%	1.4%	15.4%	3.8%	0.0%	1.0%	1.0%	54.3%
Troop E										
Corry	1.9%	43	83.7%	0.0%	20.9%	4.7%	0.0%	7.0%	14.0%	23.3%
Erie	4.4%	333	74.8%	0.6%	5.1%	2.4%	0.9%	1.2%	4.8%	31.5%
Franklin	8.5%	191	77.0%	1.0%	4.7%	12.6%	0.5%	4.7%	20.9%	34.0%
Girard	2.5%	189	79.9%	0.5%	10.1%	6.9%	0.0%	3.2%	2.6%	40.2%
Meadville	6.1%	210	57.6%	1.4%	6.2%	3.3%	1.0%	2.9%	1.9%	58.6%
Warren	1.9%	49	61.2%	2.0%	32.7%	10.2%	0.0%	4.1%	2.0%	10.2%

Table A.10. Area II Search Reasons by Station, 2024

	% of Stops Resulting in Any Search	Total # of All Searches	Incident to Arrest	Inventory	Officer Safety (Terry)	Plain View	Prob Cause + Exigency	Search Warrant	Written Consent	Verbal Consent
Troop A										
Ebensburg	6.4%	149	81.9%	0.0%	1.3%	7.4%	0.7%	1.3%	1.3%	22.1%
Greensburg	4.6%	278	70.5%	2.2%	2.2%	5.0%	0.7%	2.9%	5.0%	36.0%
Indiana	2.2%	101	87.1%	0.0%	37.6%	5.9%	0.0%	1.0%	2.0%	35.6%
Kiski Valley	2.0%	38	81.6%	5.3%	2.6%	13.2%	0.0%	5.3%	0.0%	18.4%
Somerset (A)	6.5%	177	92.7%	4.0%	5.6%	7.3%	0.0%	1.7%	1.7%	14.1%
Troop G										
Bedford	3.6%	180	63.3%	0.6%	13.9%	7.2%	0.6%	5.0%	5.0%	37.2%
Hollidaysburg	2.9%	92	77.2%	3.3%	6.5%	5.4%	1.1%	1.1%	5.4%	48.9%
Huntingdon	1.6%	65	86.2%	3.1%	4.6%	4.6%	3.1%	0.0%	1.5%	15.4%
Lewistown	2.2%	112	60.7%	3.6%	17.9%	8.0%	3.6%	4.5%	1.8%	42.0%
McConnellsburg	4.2%	110	63.6%	2.7%	1.8%	6.4%	0.0%	6.4%	0.0%	60.9%
Rockview	4.9%	330	96.7%	0.6%	0.3%	0.9%	0.0%	3.0%	1.2%	30.3%
Troop H										
Carlisle	3.4%	392	75.8%	2.8%	5.6%	5.9%	0.8%	1.8%	3.8%	39.3%
Chambersburg	3.2%	370	73.8%	2.4%	1.1%	5.1%	0.3%	4.1%	1.6%	34.1%
Gettysburg	7.4%	758	90.1%	0.4%	7.8%	3.3%	0.0%	2.4%	0.7%	32.1%
Harrisburg	8.8%	813	68.5%	3.6%	6.8%	2.7%	1.7%	4.1%	5.5%	49.2%
Lykens	4.7%	176	86.9%	5.7%	49.4%	11.9%	0.6%	1.1%	0.0%	27.3%
Newport	7.0%	260	91.2%	3.5%	11.9%	5.4%	0.8%	3.5%	1.2%	32.3%
Troop T										
Bowmansville	0.3%	14	92.9%	7.1%	7.1%	0.0%	0.0%	0.0%	0.0%	7.1%
Everett	0.5%	25	60.0%	0.0%	0.0%	20.0%	4.0%	8.0%	4.0%	32.0%
Gibsonia	0.3%	15	60.0%	0.0%	6.7%	6.7%	0.0%	0.0%	0.0%	26.7%
Highspire	2.5%	2	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	50.0%	100.0%
Jefferson Hills	0.5%	25	76.0%	16.0%	16.0%	20.0%	8.0%	0.0%	0.0%	8.0%
King of Prussia	0.3%	15	93.3%	20.0%	6.7%	13.3%	0.0%	0.0%	0.0%	13.3%
New Stanton	0.3%	12	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	8.3%
Newville	0.2%	12	83.3%	25.0%	41.7%	25.0%	0.0%	0.0%	8.3%	8.3%
Pocono	0.3%	16	50.0%	12.5%	6.2%	18.8%	0.0%	0.0%	0.0%	31.2%
Somerset (T)	1.1%	47	59.6%	4.3%	8.5%	10.6%	2.1%	2.1%	0.0%	38.3%

Table A.10. Area III Search Reasons by Station, 2024

	% of Stops Resulting in Any Search	Total # of All Searches	Incident to Arrest	Inventory	Officer Safety (Terry)	Plain View	Prob Cause + Exigency	Search Warrant	Written Consent	Verbal Consent
Troop F										
Coudersport	2.6%	120	66.7%	0.0%	0.8%	4.2%	0.0%	1.7%	4.2%	44.2%
Emporium	1.6%	17	47.1%	0.0%	58.8%	0.0%	11.8%	5.9%	17.6%	47.1%
Lamar	3.4%	131	61.1%	0.8%	1.5%	1.5%	0.0%	3.8%	3.8%	40.5%
Mansfield	2.8%	95	54.7%	1.1%	0.0%	3.2%	0.0%	0.0%	6.3%	42.1%
Milton	2.4%	165	57.6%	5.5%	7.9%	6.7%	0.6%	4.2%	2.4%	40.6%
Montoursville	4.6%	283	78.8%	1.1%	6.7%	3.5%	0.0%	2.1%	5.3%	31.8%
Selinsgrove	2.3%	90	90.0%	2.2%	5.6%	4.4%	0.0%	1.1%	0.0%	33.3%
Stonington	1.7%	45	93.3%	2.2%	0.0%	0.0%	0.0%	2.2%	2.2%	8.9%
Troop N										
Bloomsburg	3.2%	88	84.1%	6.8%	0.0%	2.3%	0.0%	0.0%	8.0%	27.3%
Fern Ridge	1.8%	60	65.0%	0.0%	5.0%	15.0%	0.0%	11.7%	1.7%	63.3%
Hazleton	8.8%	615	93.7%	4.6%	4.2%	3.7%	0.0%	0.5%	0.8%	21.3%
Lehighton	10.6%	346	91.0%	12.1%	2.9%	4.6%	0.0%	2.9%	0.9%	24.9%
Stroudsburg	7.7%	682	86.5%	1.6%	6.0%	2.6%	0.0%	2.9%	1.3%	27.1%
Troop P										
Laporte	3.2%	53	62.3%	9.4%	37.7%	7.5%	0.0%	3.8%	9.4%	49.1%
Shickshinny	0.6%	9	88.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	22.2%
Towanda	3.4%	108	72.2%	0.9%	3.7%	8.3%	0.9%	5.6%	0.9%	48.1%
Tunkhannock	1.9%	40	80.0%	0.0%	20.0%	17.5%	7.5%	0.0%	0.0%	32.5%
Wilkes-Barre	2.8%	116	83.6%	15.5%	13.8%	3.4%	0.0%	1.7%	6.9%	21.6%
Troop R										
Blooming Grove	8.6%	274	77.7%	13.5%	5.8%	4.7%	0.4%	2.6%	1.1%	46.0%
Dunmore	1.0%	38	89.5%	5.3%	2.6%	7.9%	0.0%	2.6%	0.0%	13.2%
Gibson	6.4%	114	31.6%	1.8%	1.8%	2.6%	0.0%	2.6%	4.4%	67.5%
Honesdale	0.9%	18	88.9%	11.1%	11.1%	5.6%	0.0%	0.0%	0.0%	11.1%

Table A.10. Area IV Search Reasons by Station and Specialized Units, 2024

	% of Stops Resulting in Any Search	Total # of All Searches	Incident to Arrest	Inventory	Officer Safety (Terry)	Plain View	Prob Cause + Exigency	Search Warrant	Written Consent	Verbal Consent
Troop J										
Avondale	5.3%	438	89.0%	58.9%	5.9%	3.0%	0.0%	2.5%	3.2%	10.7%
Embreeville	4.2%	316	77.5%	44.9%	9.8%	6.3%	0.6%	2.8%	3.8%	20.6%
Lancaster	4.7%	496	77.0%	30.0%	4.2%	2.6%	0.2%	3.2%	13.3%	33.9%
York	6.3%	730	73.4%	30.4%	8.2%	4.2%	0.1%	6.2%	6.0%	42.2%
Troop K										
Media	6.6%	813	78.2%	53.9%	3.4%	4.1%	0.4%	5.8%	1.7%	19.4%
Philadelphia	5.7%	481	50.9%	35.1%	25.8%	3.3%	1.2%	7.9%	5.2%	35.3%
Skippack	6.6%	233	61.8%	29.2%	15.5%	0.9%	0.9%	3.4%	0.9%	31.3%
Troop L										
Frackville	2.8%	109	78.9%	12.8%	7.3%	3.7%	1.8%	0.0%	2.8%	22.9%
Hamburg	2.7%	65	78.5%	16.9%	30.8%	18.5%	4.6%	1.5%	12.3%	30.8%
Jonestown	6.0%	288	52.8%	2.1%	0.7%	6.2%	1.0%	3.8%	19.1%	47.6%
Reading	4.7%	265	84.9%	6.4%	23.4%	2.6%	0.4%	1.5%	5.3%	21.1%
Schuylkill Haven	5.6%	240	84.6%	7.9%	11.2%	5.0%	0.0%	2.5%	23.8%	27.9%
Troop M										
Belfast	4.6%	121	48.8%	35.5%	8.3%	3.3%	0.0%	1.7%	3.3%	44.6%
Bethlehem	7.7%	536	79.1%	31.5%	5.2%	6.0%	0.0%	1.5%	5.6%	17.9%
Dublin	5.1%	156	93.6%	7.7%	5.8%	6.4%	0.0%	1.3%	5.1%	7.1%
Fogelsville	5.1%	328	68.6%	24.1%	14.6%	2.7%	0.0%	1.8%	7.0%	26.5%
Trevose	5.6%	182	79.7%	34.6%	13.2%	3.3%	0.0%	2.2%	12.1%	30.2%
Specialized Units										
SHIELD	12.0%	471	9.3%	0.8%	1.3%	0.6%	0.2%	3.0%	43.7%	81.7%
Canine	15.0%	137	15.3%	2.2%	1.5%	1.5%	0.7%	3.6%	8.0%	81.0%

Table A.11. Area I Drivers' Post-Stop Outcomes by Station, Jan - Dec 2024

	Total # of Stops	Warning	Citation	Arrest	Any Search	Discretionary Search
Troop B						
Belle Vernon	4,892	43.6%	63.5%	3.2%	4.0%	2.6%
Pittsburgh	6,309	26.3%	81.6%	1.6%	1.9%	0.7%
Uniontown	8,157	54.5%	53.3%	6.1%	9.0%	5.8%
Washington	5,466	55.0%	54.4%	5.0%	6.1%	3.3%
Waynesburg	2,151	31.4%	76.8%	0.8%	1.2%	1.0%
Troop C						
Clarion	4,121	41.6%	71.5%	2.2%	2.3%	0.5%
Clearfield	5,046	45.5%	67.3%	2.9%	3.0%	1.0%
Dubois	3,582	64.2%	67.3%	2.5%	2.8%	0.9%
Lewis Run	4,638	68.7%	44.7%	8.3%	10.0%	7.3%
Marienville	3,821	66.2%	55.5%	2.9%	3.1%	1.5%
Punxsutawney	3,082	62.9%	59.7%	4.1%	4.7%	2.7%
Ridgway	3,283	69.7%	64.9%	1.7%	1.8%	0.6%
Troop D						
Beaver	3,701	45.0%	73.3%	3.4%	4.0%	1.9%
Butler	5,081	52.5%	60.7%	5.2%	5.9%	2.7%
Kittanning	6,272	61.5%	43.0%	8.5%	9.9%	5.7%
Mercer	3,419	48.8%	66.1%	2.5%	3.0%	1.8%
New Castle	2,094	65.6%	48.1%	9.3%	9.9%	6.8%
Troop E						
Corry	2,311	66.2%	57.3%	1.6%	1.9%	1.0%
Erie	7,631	57.0%	49.3%	3.5%	4.4%	1.7%
Franklin	2,241	63.4%	49.4%	7.2%	8.5%	4.4%
Girard	7,439	52.9%	61.1%	2.1%	2.5%	1.3%
Meadville	3,419	70.3%	47.3%	4.2%	6.1%	4.0%
Warren	2,637	54.8%	63.0%	1.8%	1.9%	1.0%

Table A.11. Area II Drivers' Post-Stop Outcomes by Station, Jan - Dec 2024

	Total # of Stops	Warning	Citation	Arrest	Any Search	Discretionary Search
Troop A						
Ebensburg	2,343	30.6%	75.2%	5.9%	6.4%	2.0%
Greensburg	6,057	57.6%	62.5%	3.6%	4.6%	2.1%
Indiana	4,649	55.9%	59.5%	2.0%	2.2%	1.3%
Kiski Valley	1,886	50.6%	68.1%	1.9%	2.0%	0.7%
Somerset (A)	2,706	69.2%	53.0%	5.9%	6.5%	1.6%
Troop G						
Bedford	4,970	62.7%	61.6%	3.3%	3.6%	2.1%
Hollidaysburg	3,142	55.0%	68.0%	2.4%	2.9%	1.8%
Huntingdon	4,018	52.3%	62.4%	1.5%	1.6%	0.4%
Lewistown	5,009	64.1%	68.3%	1.9%	2.2%	1.5%
McConnellsburg	2,630	74.8%	49.4%	3.5%	4.2%	3.0%
Rockview	6,683	44.8%	69.6%	4.9%	4.9%	1.7%
Troop H						
Carlisle	11,472	70.8%	44.2%	2.8%	3.4%	1.7%
Chambersburg	11,400	71.9%	45.5%	2.6%	3.2%	1.3%
Gettysburg	10,309	77.3%	22.0%	6.9%	7.4%	3.1%
Harrisburg	9,286	71.0%	37.0%	6.1%	8.8%	5.1%
Lykens	3,715	76.9%	49.4%	4.2%	4.7%	3.1%
Newport	3,728	63.7%	46.3%	6.5%	7.0%	3.1%
Troop T						
Bowmansville	4,850	45.6%	79.1%	0.3%	0.3%	0.0%
Everett	5,388	82.5%	81.3%	0.4%	0.5%	0.2%
Gibsonia	5,878	83.7%	67.0%	0.2%	0.3%	0.1%
Highspire	79	41.8%	74.7%	2.5%	2.5%	2.5%
Jefferson Hills	4,736	74.3%	77.4%	0.5%	0.5%	0.3%
King of Prussia	5,722	45.8%	80.2%	0.2%	0.3%	0.1%
New Stanton	4,414	83.1%	69.3%	0.3%	0.3%	0.0%
Newville	5,797	41.5%	75.3%	0.2%	0.2%	0.1%
Pocono	5,395	53.1%	79.4%	0.2%	0.3%	0.1%
Somerset (T)	4,314	54.6%	80.6%	0.9%	1.1%	0.6%

Table A.11. Area III Drivers' Post-Stop Outcomes by Station, Jan - Dec 2024

	Total # of Stops	Warning	Citation	Arrest	Any Search	Discretionary Search
Troop F						
Coudersport	4,696	68.7%	50.2%	2.0%	2.6%	1.4%
Emporium	1,043	70.9%	53.6%	1.3%	1.6%	1.3%
Lamar	3,901	49.7%	52.2%	2.2%	3.4%	1.7%
Mansfield	3,348	66.8%	59.0%	2.7%	2.8%	1.4%
Milton	6,786	54.4%	55.1%	1.8%	2.4%	1.3%
Montoursville	6,099	49.7%	55.4%	4.1%	4.6%	1.9%
Selinsgrove	3,964	46.9%	63.5%	2.1%	2.3%	0.9%
Stonington	2,614	61.9%	59.6%	1.7%	1.7%	0.2%
Troop N						
Bloomsburg	2,779	39.5%	71.8%	2.7%	3.2%	1.1%
Fern Ridge	3,275	30.4%	80.5%	1.4%	1.8%	1.4%
Hazleton	6,950	37.6%	66.5%	8.4%	8.8%	2.4%
Lehighton	3,277	41.9%	63.4%	10.0%	10.6%	3.4%
Stroudsburg	8,848	46.1%	60.3%	6.9%	7.7%	2.6%
Troop P						
Laporte	1,647	50.8%	62.5%	2.0%	3.2%	2.4%
Shickshinny	1,401	46.4%	73.4%	0.6%	0.6%	0.1%
Towanda	3,184	51.7%	61.5%	2.9%	3.4%	2.0%
Tunkhannock	2,069	51.7%	63.7%	1.6%	1.9%	1.0%
Wilkes-Barre	4,154	31.4%	76.4%	2.5%	2.8%	0.9%
Troop R						
Blooming Grove	3,188	50.9%	57.4%	7.6%	8.6%	4.6%
Dunmore	3,756	33.8%	81.0%	1.0%	1.0%	0.2%
Gibson	1,774	52.8%	64.6%	3.4%	6.4%	4.8%
Honesdale	2,053	38.7%	76.0%	0.8%	0.9%	0.2%

Table A.11. Area IV Drivers' Post-Stop Outcomes by Station, Jan - Dec 2024

	Total # of Stops	Warning	Citation	Arrest	Any Search	Discretionary Search
Troop J						
Avondale	8,289	71.9%	36.2%	4.9%	5.3%	1.2%
Embreeville	7,489	60.3%	51.6%	3.8%	4.2%	1.6%
Lancaster	10,528	60.3%	47.7%	3.9%	4.7%	2.1%
York	11,559	65.8%	33.8%	5.5%	6.3%	3.6%
Troop K						
Media	12,255	56.1%	45.3%	5.7%	6.6%	2.1%
Philadelphia	8,430	56.5%	49.3%	3.6%	2.8%	3.5%
Skippack	3,528	48.4%	60.6%	4.7%	2.7%	3.3%
Troop L						
Frackville	3,872	50.9%	63.2%	2.4%	2.8%	0.9%
Hamburg	2,423	44.9%	68.6%	2.4%	2.7%	1.9%
Jonestown	4,806	50.5%	53.4%	4.2%	6.0%	3.6%
Reading	5,599	37.2%	71.7%	4.3%	4.7%	2.1%
Schuylkill Haven	4,307	43.9%	58.5%	5.1%	5.6%	2.5%
Troop M						
Belfast	2,646	45.2%	67.2%	3.2%	4.6%	2.5%
Bethlehem	6,917	59.9%	44.8%	6.9%	7.7%	2.4%
Dublin	3,043	60.3%	50.0%	5.0%	5.1%	1.1%
Fogelsville	6,488	62.3%	37.5%	4.1%	5.1%	2.3%
Trevose	3,250	69.7%	56.9%	4.7%	5.6%	2.6%
Specialized Units						
SHIELD	3,930	98.2%	0.4%	1.7%	12.0%	11.4%
Canine	913	93.3%	4.7%	5.0%	15.0%	13.3%

Table A.12. 2024 Stop Outcomes by Race and Gender for Department and Areas

	Driver Race/ Ethnicity	Total # of Stops	% Warning	% Citation	% Arrest	% Any Search	% Disc Search
PSP Dept	White	309,015	57.7%***	57.5%***	3.4%***	3.9%***	1.8%***
	Black	64,886	58.9%	52.7%	5.3%	7.0%	4.0%
	Hispanic	38,961	55.3%	54.8%	4.7%	6.3%	2.9%
	Male	290,701	57.5%	56.5%***	4.2%***	5.1%***	2.5%***
	Female	142,190	57.6%	57.4%	2.8%	3.3%	1.5%
Area I	White	83,874	55.1%***	58.8%	3.9%***	4.7%***	2.5%***
	Black	10,265	52.7%	58.5%	6.2%	8.2%	5.3%
	Hispanic	2,349	53.7%	60.5%	3.4%	5.4%	3.5%
	Male	65,668	53.9%	59.6%	4.5%***	5.5%***	3.0%***
	Female	35,059	54.2%	59.5%	3.1%	3.8%	2.1%
Area II	White	106,148	63.9%***	59.4%***	2.6%***	2.9%***	1.2%***
	Black	18,950	65.5%	57.1%	4.1%	5.5%	3.4%
	Hispanic	8,956	64.4%	55.8%	3.0%	4.1%	2.3%
	Male	93,910	63.7%**	59.5%*	3.1%***	3.7%***	1.8%***
	Female	46,608	64.5%	58.9%	2.1%	2.3%	1.0%
Area III	White	59,991	49.4%***	62.0%***	3.5%***	3.9%***	1.5%***
	Black	8,870	47.9%	61.1%	4.7%	6.3%	3.3%
	Hispanic	8,579	38.9%	68.3%	5.7%	6.7%	2.3%
	Male	54,119	47.5%**	62.7%*	4.2%***	4.8%***	2.1%***
	Female	26,538	48.5%	63.6%	3.0%	3.3%	1.2%
Area IV	White	56,365	57.3%***	49.4%***	3.9%***	4.5%***	1.9%***
	Black	25,708	59.0%	46.2%	6.0%	7.5%	3.6%
	Hispanic	17,716	55.7%	51.1%	5.5%	6.5%	2.4%
	Male	72,277	57.6%	48.7%*	5.2%***	6.2%***	2.8%***
	Female	33,016	57.8%	49.4%	3.3%	3.9%	1.5%

NOTE: Asterisks identify statistically significant chi-square associations. * $p < 0.05$ ** $p<0.01$ *** $p<0.001$

Table A.13. 2024 Stop Outcomes by Race and Gender for Troops in Areas I and II

	Driver Race/ Ethnicity	Total # of Stops	% Warning	% Citation	% Arrest	% Any Search	% Disc Search
AREA I							
Troop B	White	20,715	44.8%***	63.8%***	3.9%**	5.2%***	3.0%***
	Black	3,987	49.5%	58.4%	5.1%	7.2%	4.7%
	Hispanic	519	57.4%	49.9%	3.3%	6.0%	3.5%
	Male	17,294	44.7%*	63.1%***	4.4%***	6.0%***	3.6%***
	Female	9,618	43.3%	65.5%	2.9%	3.9%	2.2%
Troop C	White	24,429	60.5%***	59.2%***	3.8%*	4.2%	2.1%***
	Black	1,207	49.9%	73.7%	4.0%	5.1%	4.0%
	Hispanic	698	44.3%	80.2%	1.7%	3.4%	2.4%
	Male	18,791	58.0%***	62.0%**	4.0%***	4.5%***	2.3%*
	Female	8,762	61.0%	60.0%	2.9%	3.3%	1.9%
Troop D	White	16,872	54.7%	57.7%**	5.5%***	6.1%	3.2%***
	Black	2,626	54.1%	54.9%	9.6%	12.0%	8.1%
	Hispanic	378	58.2%	52.4%	4.2%	6.3%	5.0%
	Male	13,105	54.1%	57.8%	6.6%***	7.5%***	4.1%***
	Female	7,373	55.1%	56.6%	4.5%	5.4%	3.1%
Troop E	White	21,858	59.1%	54.5%	2.9%***	3.6%***	1.8%***
	Black	2,445	57.8%	55.0%	5.5%	7.4%	3.7%
	Hispanic	754	57.6%	53.4%	4.6%	6.4%	3.7%
	Male	16,478	58.8%	54.5%	3.7%***	4.5%***	2.2%***
	Female	9,306	58.5%	55.0%	2.2%	3.0%	1.5%
AREA II							
Troop A	White	15,784	54.7%	62.8%*	3.6%***	4.0%	1.4%***
	Black	1,304	55.2%	58.7%	5.8%	7.1%	3.5%
	Hispanic	269	55.8%	61.0%	2.2%	5.9%	5.2%
	Male	11,161	53.9%*	63.0%	4.2%***	4.8%***	1.9%***
	Female	6,466	55.8%	61.8%	2.8%	3.2%	1.1%
Troop G	White	22,676	56.9%***	64.9%***	3.0%***	3.1%***	1.4%***
	Black	1,865	61.5%	58.4%	5.4%	6.8%	4.8%
	Hispanic	809	57.0%	64.6%	4.1%	5.1%	3.3%
	Male	17,026	57.1%	63.8%***	3.6%***	4.0%***	2.0%***
	Female	9,396	57.2%	66.0%	2.1%	2.3%	1.1%
Troop H	White	34,956	72.2%	39.9%***	4.1%***	4.6%***	2.0%***
	Black	8,053	73.4%	35.6%	7.0%	9.5%	5.9%
	Hispanic	4,954	73.0%	38.6%	4.5%	6.0%	3.1%
	Male	33,552	71.9%**	39.2%	5.2%***	6.4%***	3.3%***
	Female	16,297	73.3%	39.1%	3.4%	3.9%	1.7%
Troop T	White	32,732	64.2%***	74.8%***	0.3%*	0.3%***	0.1%***
	Black	7,728	60.0%	78.9%	0.5%	0.6%	0.3%
	Hispanic	2,924	52.7%	81.8%	0.4%	0.6%	0.4%
	Male	32,171	62.1%*	77.2%***	0.4%***	0.4%**	0.2%*
	Female	14,449	63.2%	75.2%	0.2%	0.3%	0.1%

NOTE: Asterisks identify statistically significant chi-square associations. * p <0.05 ** p<0.01 *** p<0.001

Table A.13. 2024 Stop Outcomes by Race and Gender for Troops in Areas III and IV

	Driver Race/ Ethnicity	Total # of Stops	% Warning	% Citation	% Arrest	% Any Search	% Disc Search
AREA III							
Troop F	White	27,213	56.7%	56.2%***	2.3%***	2.5%***	1.0%***
	Black	2,656	57.9%	48.6%	4.4%	6.6%	4.3%
	Hispanic	1,374	59.0%	52.0%	2.8%	5.0%	3.8%
	Male	21,263	56.6%	55.3%**	2.8%***	3.4%***	1.6%***
	Female	11,142	56.6%	57.1%	1.8%	2.0%	0.8%
Troop N	White	14,432	41.9%***	64.8%***	6.9%**	7.4%	2.4%**
	Black	4,021	44.6%	64.1%	5.7%	6.8%	2.9%
	Hispanic	5,278	33.6%	70.9%	7.6%	8.1%	1.9%
	Male	17,283	40.1%	66.1%	6.9%**	7.5%***	2.5%*
	Female	7,779	41.0%	67.2%	5.9%	6.4%	2.0%
Troop P	White	10,245	46.3%***	66.9%***	2.1%	2.5%*	1.3%
	Black	1,053	34.8%	75.0%	2.9%	4.0%	1.9%
	Hispanic	809	33.6%	75.8%	2.1%	2.3%	0.9%
	Male	8,354	43.7%	68.9%	2.5%**	3.0%***	1.6%***
	Female	4,074	45.5%	67.3%	1.6%	2.8%	0.8%
Troop R	White	8,101	42.4%***	70.6%*	3.3%	3.7%***	1.9%***
	Black	1,140	48.5%	66.6%	3.4%	5.7%	3.9%
	Hispanic	1,118	43.2%	70.7%	3.4%	5.2%	3.3%
	Male	7,219	42.9%	69.6%*	3.9%***	4.9%***	2.7%***
	Female	3,543	43.1%	71.7%	2.2%	2.6%	1.4%
AREA IV							
Troop J	White	22,582	64.9%***	42.0%***	3.6%***	4.1%***	1.7%***
	Black	8,104	65.5%	38.0%	6.7%	7.8%	4.1%
	Hispanic	5,820	62.5%	44.4%	6.0%	6.6%	2.0%
	Male	25,567	64.2%*	41.9%	5.2%***	5.9%***	2.6%***
	Female	12,262	65.3%	41.3%	3.3%	3.8%	1.6%
Troop K	White	9,481	53.5%***	49.2%**	4.3%***	5.2%***	2.3%***
	Black	10,722	56.8%	47.9%	5.5%	7.5%	3.5%
	Hispanic	2,319	53.3%	51.5%	5.1%	7.5%	3.0%
	Male	17,047	55.5%	47.9%***	5.4%***	7.2%***	3.3%***
	Female	7,172	54.3%	51.3%	3.3%	4.1%	1.4%
Troop L	White	13,531	44.9%	62.5%*	3.7%*	4.3%***	2.1%***
	Black	2,440	46.6%	61.6%	4.5%	5.8%	3.4%
	Hispanic	4,253	44.2%	64.7%	4.4%	5.4%	2.3%
	Male	14,069	45.4%	62.3%**	4.4%***	5.3%***	2.8%***
	Female	6,906	44.2%	64.4%	2.7%	3.0%	1.3%
Troop M	White	10,771	60.3%	48.7%	4.6%***	5.1%***	1.8%***
	Black	4,442	59.1%	48.4%	6.5%	7.9%	3.4%
	Hispanic	5,324	58.5%	47.3%	5.9%	7.0%	2.7%
	Male	15,594	59.9%*	48.4%*	5.5%***	6.5%***	2.6%***
	Female	6,676	61.7%	46.6%	4.1%	4.7%	1.5%

NOTE: Asterisks identify statistically significant chi-square associations. * p <0.05 ** p<0.01 *** p<0.001

Table A.14. 2024 Stop Outcomes by Race at the Station Level

	Drivers	Total # of Stops	% Warning	% Citation	% Arrest	% Any Search	% Disc Search
AREA I, Troop B							
Belle Vernon	White	3,280	45.5%***	63.9%***	3.6%	4.2%*	2.5%**
	Black	894	56.5%	49.7%	4.3%	5.7%	4.5%
	Hispanic	122	67.2%	34.4%	0.0%	0.8%	0.8%
Pittsburgh	White	4,012	26.5%*	81.5%*	1.4%***	1.6%***	0.5%***
	Black	1,304	30.3%	79.4%	3.0%	3.8%	1.8%
	Hispanic	124	32.3%	73.4%	4.0%	4.8%	0.8%
Uniontown	White	7,070	53.2%***	54.9%***	6.0%	8.6%**	5.5%*
	Black	916	62.6%	44.0%	6.8%	11.4%	7.6%
	Hispanic	82	73.2%	37.8%	6.1%	13.4%	9.8%
Washington	White	4,368	53.5%***	56.2%***	4.6%***	5.4%***	2.7%***
	Black	773	60.7%	48.3%	8.2%	10.1%	6.6%
	Hispanic	172	64.0%	46.5%	4.1%	7.6%	4.7%
Waynesburg	White	1,985	31.5%	76.9%	0.8%	1.1%*	0.9%
	Black	100	31.0%	74.0%	3.0%	4.0%	3.0%
	Hispanic	19	31.6%	78.9%	0.0%	0.0%	0.0%
AREA I, Troop C							
Clarion	White	3,498	43.4%***	69.4%***	2.3%	2.4%	0.5%
	Black	280	37.5%	80.7%	2.1%	2.1%	1.1%
	Hispanic	162	30.2%	87.0%	1.9%	1.9%	0.0%
Clearfield	White	4,281	48.3%***	64.3%***	3.3%**	3.5%**	1.2%
	Black	253	30.4%	81.8%	0.8%	0.8%	0.8%
	Hispanic	168	20.2%	91.1%	0.0%	0.0%	0.0%
Dubois	White	2,923	66.0%***	63.8%***	3.0%**	3.0%	0.8%***
	Black	258	57.8%	82.6%	0.4%	1.2%	0.8%
	Hispanic	188	55.9%	81.9%	0.5%	3.7%	3.7%
Lewis Run	White	4,199	69.9%*	43.0%*	8.3%*	9.9%**	7.1%***
	Black	171	60.2%	50.9%	14.0%	17.5%	15.2%
	Hispanic	65	66.2%	52.3%	6.2%	13.8%	10.8%
Marienville	White	3,652	66.3%	55.3%	2.7%***	2.9%***	1.3%***
	Black	73	63.0%	50.7%	12.3%	13.7%	9.6%
	Hispanic	44	68.2%	63.6%	2.3%	2.3%	0.0%
Punxsutawney	White	2,986	62.6%	60.0%	4.1%	4.5%***	2.5%***
	Black	52	71.2%	50.0%	9.6%	15.4%	11.5%
	Hispanic	23	69.6%	52.2%	4.3%	8.7%	4.3%
Ridgway	White	2,888	70.3%	62.5%***	1.8%	1.9%	0.6%**
	Black	120	70.8%	78.3%	0.8%	1.7%	1.7%
	Hispanic	48	66.7%	79.2%	4.2%	4.2%	4.2%

	Drivers	Total # of Stops	% Warning	% Citation	% Arrest	% Any Search	% Disc Search
AREA I, Troop D							
Beaver	White	2,869	46.3%**	73.1%	2.8%***	3.2%***	1.4%***
	Black	676	39.9%	73.2%	6.2%	7.5%	4.4%
	Hispanic	72	41.7%	80.6%	4.2%	5.6%	2.8%
Butler	White	4,578	51.4%*	62.3%**	5.2%	5.9%	2.4%
	Black	259	59.8%	51.0%	6.2%	8.9%	6.6%
	Hispanic	67	53.7%	58.2%	3.0%	7.5%	7.5%
Kittanning	White	4,779	62.0%	42.5%*	7.7%***	8.7%***	4.6%***
	Black	1,130	59.3%	44.8%	13.6%	17.2%	11.7%
	Hispanic	122	67.2%	33.6%	3.3%	4.1%	2.5%
Mercer	White	2,883	49.6%	65.7%*	2.4%	2.8%**	1.7%**
	Black	301	48.8%	65.8%	3.7%	4.7%	2.3%
	Hispanic	70	54.3%	48.6%	5.7%	8.6%	7.1%
New Castle	White	1,760	65.3%	48.7%	9.1%	9.7%	6.3%
	Black	260	68.5%	42.3%	11.5%	12.3%	10.0%
	Hispanic	47	72.3%	55.3%	6.4%	8.5%	8.5%
AREA I, Troop E							
Corry	White	2,244	66.3%	57.3%	1.5%***	1.7%***	0.9%
	Black	41	63.4%	63.4%	9.8%	9.8%	2.4%
	Hispanic	13	61.5%	53.8%	0.0%	0.0%	0.0%
Erie	White	5,750	57.7%	48.4%**	3.0%***	3.6%***	1.4%***
	Black	1,218	54.2%	53.4%	6.1%	7.7%	3.0%
	Hispanic	384	55.5%	48.7%	6.0%	8.1%	3.9%
Franklin	White	2,040	62.9%	49.4%	7.2%	8.3%	4.1%*
	Black	113	69.9%	46.0%	10.6%	12.4%	7.1%
	Hispanic	39	66.7%	38.5%	10.3%	15.4%	12.8%
Girard	White	6,162	52.6%**	60.8%	2.0%	2.4%**	1.2%**
	Black	747	58.4%	60.1%	2.9%	4.0%	2.3%
	Hispanic	224	56.2%	62.1%	3.6%	4.5%	3.1%
Meadville	White	2,999	71.0%	46.3%	4.0%**	5.6%***	3.5%***
	Black	261	67.4%	49.4%	8.0%	14.6%	11.1%
	Hispanic	75	70.7%	54.7%	0.0%	1.3%	1.3%
Warren	White	2,542	55.0%	63.1%	1.8%	1.9%	1.0%
	Black	51	51.0%	62.7%	2.0%	2.0%	0.0%
	Hispanic	16	50.0%	68.8%	0.0%	0.0%	0.0%

	Drivers	Total # of Stops	% Warning	% Citation	% Arrest	% Any Search	% Disc Search
AREA II, Troop A							
Ebensburg	White	2,025	31.8%	74.2%	5.7%**	6.1%***	1.7%***
	Black	203	24.1%	79.3%	10.3%	12.3%	5.4%
	Hispanic	48	27.1%	85.4%	0.0%	0.0%	0.0%
Greensburg	White	5,400	56.7%***	63.3%***	3.4%**	4.1%***	1.8%***
	Black	481	64.0%	57.0%	6.2%	8.3%	3.3%
	Hispanic	96	77.1%	46.9%	3.1%	13.5%	12.5%
Indiana	White	4,097	55.6%	60.3%**	1.9%*	2.0%**	1.2%
	Black	428	59.3%	51.9%	3.7%	4.4%	2.6%
	Hispanic	62	54.8%	56.5%	1.6%	1.6%	1.6%
Kiski Valley	White	1,696	50.8%	68.8%	1.9%	1.9%	0.5%***
	Black	121	52.1%	59.5%	3.3%	4.1%	3.3%
	Hispanic	33	39.4%	72.7%	0.0%	0.0%	0.0%
Somerset (A)	White	2,566	69.4%	52.9%	6.0%	6.6%	1.5%
	Black	71	64.8%	52.1%	5.6%	5.6%	4.2%
	Hispanic	30	53.3%	63.3%	6.7%	6.7%	3.3%
AREA II, Troop G							
Bedford	White	4,348	63.5%	60.1%	3.3%	3.5%**	1.9%**
	Black	313	60.7%	64.5%	5.4%	7.0%	4.8%
	Hispanic	110	54.5%	69.1%	4.5%	5.5%	3.6%
Hollidaysburg	White	2,787	54.4%**	68.4%*	2.4%	2.9%	1.5%**
	Black	226	66.4%	60.2%	2.7%	4.4%	4.4%
	Hispanic	47	48.9%	76.6%	2.1%	4.3%	4.3%
Huntingdon	White	3,616	52.5%	63.5%**	1.6%	1.6%	0.4%
	Black	114	51.8%	48.2%	1.8%	2.6%	0.9%
	Hispanic	33	33.3%	57.6%	6.1%	6.1%	0.0%
Lewistown	White	4,335	64.0%	67.6%	1.7%**	1.8%***	1.1%***
	Black	312	67.3%	67.6%	4.5%	6.4%	5.4%
	Hispanic	215	63.3%	70.7%	3.3%	4.2%	3.3%
McConnellsburg	White	1,973	74.3%	52.4%***	2.8%***	3.1%***	2.0%***
	Black	374	77.8%	37.4%	8.0%	10.2%	8.3%
	Hispanic	157	75.8%	43.3%	2.5%	4.5%	3.2%
Rockview	White	5,617	44.5%	69.9%	4.9%	4.9%	1.5%**
	Black	526	47.0%	65.6%	6.1%	6.3%	2.9%
	Hispanic	247	45.3%	69.6%	5.7%	6.1%	3.6%

	Drivers	Total # of Stops	% Warning	% Citation	% Arrest	% Any Search	% Disc Search
AREA II, Troop H							
Carlisle	White	8,033	70.6%	43.8%	2.5%***	2.9%***	9.0%***
	Black	1,964	72.1%	44.6%	4.4%	5.6%	3.6%
	Hispanic	1,004	70.3%	47.5%	1.9%	3.3%	2.1%
Chambersburg	White	8,155	71.3%	46.3%**	2.4%*	2.7%***	0.9%***
	Black	1,657	74.0%	41.6%	3.4%	4.5%	2.7%
	Hispanic	1,312	71.5%	46.8%	3.3%	4.6%	1.9%
Gettysburg	White	7,601	77.9%	20.9%***	6.7%***	7.0%***	2.8%***
	Black	1,258	75.1%	21.1%	10.0%	11.1%	5.6%
	Hispanic	1,157	78.1%	25.9%	5.5%	6.0%	2.5%
Harrisburg	White	4,773	69.6%***	42.0%***	4.3%***	5.4%***	2.6%***
	Black	2,631	74.3%	29.0%	9.7%	14.8%	9.7%
	Hispanic	1,197	71.2%	35.0%	6.3%	9.3%	5.6%
Lykens	White	3,283	77.0%*	49.4%	3.9%**	4.4%**	3.0%**
	Black	227	70.5%	54.2%	7.9%	9.3%	6.6%
	Hispanic	138	80.4%	41.3%	5.8%	6.5%	2.2%
Newport	White	3,111	63.8%	46.2%**	6.5%	6.8%	2.7%***
	Black	316	65.5%	46.8%	7.9%	9.8%	6.3%
	Hispanic	146	70.5%	32.2%	8.2%	8.9%	6.2%
Area II, Troop T							
Bowmansville	White	3,033	44.8%***	78.2%*	0.3%	0.3%	0.0%*
	Black	963	52.9%	78.0%	0.5%	0.6%	0.2%
	Hispanic	506	38.9%	83.6%	0.0%	0.0%	0.0%
Everett	White	3,417	83.1%***	80.7%	0.4%	0.5%	0.2%
	Black	1,013	83.2%	79.9%	0.4%	0.5%	0.4%
	Hispanic	358	74.3%	83.2%	0.6%	0.6%	0.6%
Gibsonia	White	4,766	83.9%*	66.3%*	0.2%	0.2%	0.1%
	Black	674	84.7%	67.8%	0.4%	0.4%	0.1%
	Hispanic	171	76.0%	76.6%	0.6%	0.6%	0.0%
Highspire	White	51	49.0%	72.5%	3.9%	3.9%	3.9%
	Black	17	23.5%	82.4%	0.0%	0.0%	0.0%
	Hispanic	4	50.0%	75.0%	0.0%	0.0%	0.0%
Jefferson Hills	White	3,855	73.4%*	75.9%**	0.5%	0.5%	0.3%
	Black	442	78.3%	79.6%	0.7%	0.9%	0.2%
	Hispanic	85	64.7%	89.4%	1.2%	1.2%	1.2%
King of Prussia	White	3,437	46.1%**	78.8%**	0.1%*	0.2%*	0.1%
	Black	1,421	48.5%	83.0%	0.3%	0.3%	0.1%
	Hispanic	441	40.1%	82.5%	0.7%	0.9%	0.2%
New Stanton	White	3,716	83.7%*	68.9%	0.3%	0.3%	0.0%
	Black	452	81.2%	72.1%	0.2%	0.2%	0.0%
	Hispanic	106	74.5%	71.7%	0.0%	0.0%	0.0%
Newville	White	3,930	42.4%	73.4%**	0.2%	0.2%	0.1%
	Black	1,044	40.8%	77.4%	0.3%	0.3%	0.2%
	Hispanic	390	41.5%	79.0%	0.0%	0.3%	0.3%
Pocono	White	3,621	54.9%***	77.0%***	0.2%	0.2%	0.1%
	Black	942	47.8%	83.4%	0.4%	0.5%	0.3%
	Hispanic	611	52.7%	84.0%	0.5%	0.5%	0.3%

	Drivers	Total # of Stops	% Warning	% Citation	% Arrest	% Any Search	% Disc Search
Somerset (T)	White	2,853	55.0%	79.5%	0.7%**	0.7%***	0.2%***
	Black	738	55.3%	81.2%	2.0%	2.4%	1.8%
	Hispanic	246	59.3%	80.5%	0.4%	2.0%	1.6%
AREA III, Troop F							
Coudersport	White	4,466	68.9%	50.2%	1.8%*	2.4%*	1.2%***
	Black	55	63.6%	54.5%	5.5%	5.5%	5.5%
	Hispanic	50	70.0%	42.0%	6.0%	8.0%	6.0%
Emporium	White	986	71.1%	53.8%	1.1%**	1.4%**	1.1%**
	Black	27	70.4%	51.9%	3.7%	3.7%	3.7%
	Hispanic	19	57.9%	57.9%	10.5%	10.5%	10.5%
Lamar	White	2,926	47.7%***	54.2%***	2.4%	2.7%***	0.7%***
	Black	535	65.6%	37.8%	2.1%	5.8%	4.9%
	Hispanic	263	60.5%	44.1%	0.8%	6.8%	6.5%
Mansfield	White	2,702	68.5%***	56.8%*	3.1%	3.1%	1.3%*
	Black	225	56.4%	64.0%	2.2%	3.1%	2.7%
	Hispanic	104	57.7%	65.4%	3.8%	3.8%	3.8%
Milton	White	5,421	53.2%***	56.5%***	1.7%*	1.8%***	0.7%***
	Black	678	61.9%	45.9%	3.2%	6.3%	4.9%
	Hispanic	419	62.5%	46.8%	2.4%	4.8%	3.8%
Montoursville	White	5,089	49.1%**	57.1%***	3.5%***	3.9%***	1.4%***
	Black	694	55.2%	43.5%	9.4%	11.0%	5.5%
	Hispanic	179	55.9%	49.7%	3.4%	5.6%	2.8%
Selinsgrove	White	3,281	48.5%***	61.8%***	2.0%	2.1%	0.8%
	Black	328	36.9%	72.3%	2.7%	3.4%	1.2%
	Hispanic	208	47.1%	65.9%	4.3%	4.3%	1.9%
Stonington	White	2,341	61.4%	60.2%**	1.7%	1.7%	0.1%***
	Black	114	71.9%	45.6%	1.8%	2.6%	1.8%
	Hispanic	132	65.2%	57.6%	1.5%	1.5%	0.8%
AREA III, Troop N							
Bloomsburg	White	2,003	40.7%*	69.6%**	3.0%	3.4%	1.1%
	Black	298	38.9%	72.1%	2.0%	3.4%	1.3%
	Hispanic	238	31.1%	80.7%	2.9%	3.8%	1.7%
Fern Ridge	White	1,987	30.0%*	80.8%	1.3%	1.5%*	1.0%**
	Black	562	33.8%	77.8%	2.0%	3.0%	2.8%
	Hispanic	581	26.9%	82.6%	1.5%	2.4%	1.9%
Hazleton	White	3,175	42.9%***	63.5%***	8.5%**	8.9%*	3.0%***
	Black	820	51.6%	54.1%	6.3%	7.6%	3.5%
	Hispanic	2,572	27.0%	73.1%	10.1%	10.3%	1.4%
Lehighton	White	2,485	42.4%	62.1%*	10.3%	10.8%	3.0%*
	Black	291	44.3%	62.2%	12.4%	13.4%	6.2%
	Hispanic	384	40.1%	69.5%	7.8%	8.3%	3.6%
Stroudsburg	White	4,782	46.4%	58.3%***	8.1%**	8.8%*	3.0%
	Black	2,049	45.6%	63.5%	6.1%	7.2%	2.4%
	Hispanic	1,503	46.2%	61.2%	6.2%	7.2%	2.4%

	Drivers	Total # of Stops	% Warning	% Citation	% Arrest	% Any Search	% Disc Search
AREA III, Troop P							
Laporte	White	1,459	51.8%*	61.9%	1.8%	2.9%*	2.2%**
	Black	80	51.2%	62.5%	5.0%	8.8%	7.5%
	Hispanic	69	34.8%	75.4%	4.3%	4.3%	1.4%
Shickshinny	White	1,165	47.6%	72.2%*	0.4%	0.4%	0.2%
	Black	111	37.8%	81.1%	0.9%	0.9%	0.0%
	Hispanic	107	41.1%	80.4%	1.9%	1.9%	0.0%
Towanda	White	2,935	52.1%	61.7%	2.8%	3.2%**	1.9%*
	Black	125	53.6%	53.6%	6.4%	8.8%	5.6%
	Hispanic	78	38.5%	67.9%	2.6%	2.6%	1.3%
Tunkhannock	White	1,872	52.4%	62.7%*	1.7%	2.0%	1.1%
	Black	81	42.0%	75.3%	0.0%	0.0%	0.0%
	Hispanic	77	44.2%	70.1%	1.3%	1.3%	1.3%
Wilkes-Barre	White	2,814	32.7%*	75.6%	2.5%	2.7%	0.9%
	Black	656	27.7%	79.6%	2.7%	3.5%	1.1%
	Hispanic	478	29.3%	77.0%	1.9%	2.3%	0.8%
AREA III, Troop R							
Blooming Grove	White	2,376	51.3%	57.0%	7.6%	8.3%	4.3%
	Black	299	54.2%	56.5%	8.4%	11.4%	6.4%
	Hispanic	378	46.8%	61.9%	7.1%	7.9%	4.5%
Dunmore	White	2,632	33.7%	79.7%*	0.9%	0.9%	0.2%*
	Black	513	32.9%	83.6%	1.6%	1.6%	0.8%
	Hispanic	502	36.7%	83.7%	0.8%	0.8%	0.0%
Gibson	White	1,230	49.7%***	69.6%***	3.8%	5.2%***	3.3%***
	Black	248	74.2%	41.1%	2.0%	8.9%	8.5%
	Hispanic	160	58.1%	47.5%	3.8%	14.4%	12.5%
Honesdale	White	1,862	38.5%	75.8%	0.8%	0.9%	0.2%
	Black	80	47.5%	73.8%	1.2%	1.3%	1.2%
	Hispanic	78	37.2%	76.9%	1.3%	1.3%	0.0%
AREA IV, Troop J							
Avondale	White	4,916	73.0%***	34.0%***	4.0%***	4.3%***	0.9%***
	Black	1,241	75.4%	34.4%	6.0%	6.9%	2.7%
	Hispanic	1,903	67.2%	42.4%	7.3%	7.5%	0.8%
Embreeville	White	4,058	62.0%***	50.0%***	3.2%***	3.5%***	1.1%***
	Black	1,940	60.4%	52.3%	5.5%	6.0%	2.7%
	Hispanic	994	54.2%	59.0%	4.1%	4.6%	1.8%
Lancaster	White	6,821	59.6%***	50.0%***	3.2%***	4.0%***	2.1%
	Black	1,707	65.1%	38.7%	5.4%	6.6%	2.9%
	Hispanic	1,751	59.3%	46.7%	5.0%	5.8%	1.8%
York	White	6,787	66.1%	34.9%***	4.1%***	4.5%***	2.4%***
	Black	3,216	65.1%	30.5%	8.4%	9.9%	6.1%
	Hispanic	1,172	66.6%	31.8%	6.8%	8.0%	4.2%

	Drivers	Total # of Stops	% Warning	% Citation	% Arrest	% Any Search	% Disc Search
AREA IV, Troop K							
Media	White	5,028	54.8%*	46.7%*	4.1%***	4.7%***	1.5%***
	Black	5,524	57.5%	44.1%	6.9%	8.2%	2.7%
	Hispanic	922	54.9%	45.8%	7.7%	9.3%	2.9%
Philadelphia	White	2,318	56.1%	45.2%***	3.9%	5.2%*	3.0%**
	Black	4,325	56.6%	50.8%	3.9%	6.7%	4.4%
	Hispanic	1,043	54.5%	52.0%	2.9%	5.4%	3.0%
Skippack	White	2,115	47.7%	59.7%	5.2%	6.6%	3.4%
	Black	846	51.9%	59.6%	4.4%	6.6%	3.8%
	Hispanic	351	45.3%	65.5%	4.8%	8.8%	3.1%
AREA IV, Troop L							
Frackville	White	2,611	53.1%***	60.2%***	2.3%	2.9%	0.9%
	Black	401	43.6%	71.8%	3.0%	3.5%	1.7%
	Hispanic	782	48.5%	68.4%	2.6%	2.6%	0.4%
Hamburg	White	1,502	43.5%	69.3%*	2.4%	2.7%	2.1%
	Black	245	42.4%	68.6%	3.3%	3.7%	2.0%
	Hispanic	445	38.4%	76.2%	3.1%	3.4%	1.8%
Jonestown	White	3,187	47.4%***	57.0%***	3.8%*	4.8%***	2.7%***
	Black	595	56.5%	46.4%	4.9%	8.4%	6.1%
	Hispanic	857	58.9%	42.5%	5.7%	8.9%	5.5%
Reading	White	2,853	36.6%**	72.6%*	4.0%	4.3%	2.2%
	Black	808	42.5%	67.8%	4.3%	5.1%	2.4%
	Hispanic	1,747	36.4%	72.2%	5.1%	5.7%	1.9%
Schuylkill Haven	White	3,378	44.0%	58.1%	5.0%	5.5%	2.5%
	Black	391	45.5%	57.3%	6.6%	6.9%	3.8%
	Hispanic	422	44.3%	60.0%	3.8%	4.3%	1.4%
AREA IV, Troop M							
Belfast	White	1,537	46.0%	66.6%	2.5%*	3.1%***	1.6%***
	Black	529	44.6%	66.4%	4.7%	7.4%	4.5%
	Hispanic	453	44.4%	68.2%	3.8%	6.2%	4.0%
Bethlehem	White	2,850	59.8%*	44.6%**	6.6%*	7.3%**	1.8%**
	Black	1,380	55.7%	46.1%	9.1%	10.4%	3.6%
	Hispanic	2,060	56.7%	49.1%	7.3%	8.1%	2.7%
Dublin	White	1,925	59.2%	48.1%	5.6%	5.7%	1.0%
	Black	379	62.3%	51.5%	4.7%	4.7%	1.3%
	Hispanic	442	62.0%	47.3%	4.5%	4.0%	1.6%
Fogelsville	White	2,867	63.0%	40.1%**	3.1%***	3.6%***	1.8%**
	Black	1,223	62.7%	35.0%	5.1%	6.5%	3.4%
	Hispanic	1,919	61.0%	37.3%	5.7%	7.2%	2.9%
Trevose	White	1,592	71.8%*	55.5%	4.5%*	5.3%*	2.8%
	Black	931	66.6%	58.0%	6.3%	7.5%	3.3%
	Hispanic	450	66.9%	60.9%	3.6%	4.4%	1.8%
Specialized Units							
SHIELD	White	1,658	98.7%	0.2%	0.9%***	6.4%***	6.0%***
	Black	682	97.5%	0.7%	4.1%	17.0%	15.0%
	Hispanic	1,097	98.1%	0.6%	1.5%	16.9%	16.7%
Canine	White	430	93.0%	7.0%**	5.8%	12.6%	10.5%
	Black	269	93.7%	3.7%	5.2%	16.7%	14.9%
	Hispanic	157	94.3%	0.6%	3.2%	18.5%	17.2%

Table A.15. Binary Logistic Regression Analyses Predicting DISCRETIONARY SEARCHES During Traffic Stops in 2024 (n=432,880)

	Coefficient	St. Error	Odds Ratio
Intercept	-2.65	0.098	--
Legal Measures			
Equipment Only Violation	1.18*	0.045	3.25
License Only Violation	1.44*	0.066	4.23
Moving Only Violation	1.18*	0.042	3.26
Registration Only Violation	0.66*	0.049	1.93
Other Only Violation	1.76*	0.073	5.83
Multiple Reasons	1.53*	0.046	4.62
Special Traffic Enforcement	-0.41*	0.037	1.51
Criminal History Detected	2.98*	0.027	19.78
Driver Characteristics			
Black	0.33*	0.028	1.39
Hispanic	0.00	0.038	--
Other Race	-0.12	0.084	--
Race & Ethnicity Unknown	-0.58*	0.132	1.79
Male	0.25*	0.027	1.28
Driver Under 25 Years Old	0.16*	0.030	1.18
Driver Behavior Civil	-0.92*	0.048	2.50
Limited English Proficiency	0.43*	0.098	1.53
Vehicle Characteristics			
Pennsylvania Plate Registration	-0.29*	0.030	1.34
Passengers Present	0.95*	0.025	2.58
Situational Characteristics			
Daytime	-0.51*	0.024	1.67
Weekday (Mon-Thurs)	0.04	0.025	--
Summer Months (June-August)	0.03	0.026	--
Interstate	-0.52*	0.029	1.68
PSP Member Characteristics			
Male Trooper	-0.19*	0.050	1.21
Non-White Trooper	-0.05	0.044	--
3 Years Less Experience	-0.05	0.027	--
Patrol Assignment	-0.47*	0.044	1.60
Trooper Rank	-1.01*	0.030	2.74
Nagelkerke R-Square	0.265		

*$p < 0.001$ Only odds ratios for statistically significant estimates are presented. Odds Ratios for negative coefficients are calculated as 1/Exp(B), which equates to a value > 1.0, which we include as a negative odds ratio (-). This odds ratio can be interpreted as 'less likely' with the binary outcome.