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# Traffic Stop Practices of the Louisville Police Department: January 15 - December 31, 2001

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Submitted to
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## Executive Summary

This report summarizes the findings of a study conducted using data collected by the Louisville Division of Police between January 15, 2001 and December 31, 2001. These data resulted from 48,586 interactions between law enforcement officers and citizens during traffic-related contacts.

Information was collected about the driver, the officer, and the stop event. Driver demographics included race, sex, age, residency, license number, and vehicle registration. The only information collected about the officer was officer badge number. Finally, data collected about the stop event include the date, time of day, reason for stop, activities during the stop, number of passengers, and stop outcome.

Data analysis was conducted with the aid of SPSS-11.0 (Statistical Package for the Social Sciences). Analyses were conducted on two levels. First, descriptive analysis, using percentages, summarized stop patterns, stop characteristics, and driver demographics. This information is useful only to describe the existing state of affairs ("what is"), but not to explain them ("why") or to formulate predictions about future events ("what if"). To address the complex relationships that exist among different variables, a program called "chi-square automatic interaction detector" or CHAID was used to evaluate the variables in terms of their relationships with one another (multivariate analysis).

Temporally, it was not feasible to determine which month was the most active given several problems with the data on this variable. The most active time of day for stops was between 5-6pm, with 7.4% of all stops, followed by the time period from 4-5pm with 6.7% of all stops. Overall, the 2nd shift (3-11pm) was the most active, with 46% of all stops, followed by the 3rd shift (30%), and the 1st shift (24%).

Stopped drivers were mostly white (64%), male (70%), between 24 and 40 years old (46%), and Louisville residents (63%). Drivers were mainly stopped for penal code violations (67%), were checked for outstanding warrants (78%), were not searched (84%), and were issued citations (67%). Drivers who were searched (17%) were searched incident to arrest (52%), and by consent (40%). About 1 in 5 searches (19%) were because of the odor of drugs or alcohol. Contraband was discovered in 31% of searches. In cases where there was a search and contraband was discovered, 74% resulted in an arrest.

The descriptive analysis indicated some slight percentage differences among the races in certain events (e.g., stopped for equipment/registration violations). These percentage differences, however, cannot be used to infer correlation or causation ("racial profiling"). To make these types of inferences, multivariate analyses using CHAID were conducted. CHAID segments the sample of traffic stops and reveals the interrelationship between the potential predictors and the events involved in the stop. The CHAID procedure generates a "decision tree" that identifies significant predictors of each decision in question. In effect, the procedure "cross-references" each event with each potential predictor.

Results from CHAID analyses resulted in five events (violation of the penal code, being asked to exit, being searched, being subject to a warrant check, and being arrested) with significant predictors. Being stopped for a penal code violation was significantly related to the race of the driver; other persons of color (72%) and whites (69%) were most likely to be stopped for this reason. Age, however, had a strong interactive effect with race. Being asked to exit, being searched, being subject to a warrant check, and being arrested all were predicted by being stopped for a misdemeanor. Driver sex also surfaced as a predictor in some situations.

These data provide no empirical evidence that the LPD is systematically engaging in discriminatory stop practices. In general, stops conducted by the department, as a whole, during the study period, do not involve the race of the driver as a significant factor related to events and outcomes. The only exception to this involves stops for penal code violations, where other persons of color and whites were most likely stopped for this reason. These types of stops involve fairly low levels of officer discretion given that penal code violations are more serious than other reasons for which a driver might be stopped. This does not mean, however, that no individual citizen ever experienced discrimination. It is always possible that individual officers may engage in racially biased practices, both in determining which drivers they will or will not stop and in determining what steps to take after the initial contact. To detect discriminatory practices at this level, however, requires constant vigilance by the community, by all the officers within the department, and by the departmental administration. Statistical analysis, while valuable, cannot substitute for community involvement and effective management.

The full report provides a discussion of the "baseline dilemma" and makes recommendations for continued study to obtain a full year of data.

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## Introduction

Accusations of discriminatory traffic stop practices ("racial profiling") have emerged as a critical issue facing law enforcement. According to a 1999 Gallup poll and research conducted by the American Institute of Public Opinion (2000), many believe that racial profiling is widespread and disapprove of the practice of stopping motorists simply because the driver fits a particular profile (Newport, 1999). In response to this growing concern regarding traffic stops and a more general distrust of law enforcement personnel, many police departments across the U.S. have begun to more closely examine their traffic stop policies and procedures. Further, some police departments have begun collecting traffic stop data. The collection of traffic stop data initially may appear to be a rather straightforward process. In reality, however, the collection and analysis of traffic stop data is far from simplistic. A number of concerns must be addressed by any agency contemplating such an endeavor. These concerns range from defining the issues, developing data collection instruments and procedures, training personnel to collect data, and determining the most appropriate means to analyze the data.

### Defining Racial Profiling

The precise definition of racial profiling is a matter of debate. While no universal definition exists, racial profiling is generally regarded as any act by law enforcement, whether it involves motorists or pedestrians, based solely on the race of the alleged violator (Ramirez, McDevitt & Farrell, 2000). In expanding on this broad definition, the U.S. Department of Justice considers racial profiling to be "any police action that relies upon the race, ethnicity or national origin of an individual rather than behavior of that individual that leads the police to a particular individual who has been engaged in or having been engaged in criminal activity" (Ramirez, McDevitt & Farrell, 2000). Accordingly, police may use race and ethnicity to determine if an

individual matches a suspect description but police may not use stereotypes when deciding who to stop, to search, or make subject to other stop – related actions.

Further, as Withrow (2002) notes, profiling by police can be further defined based on specific factors used in profiling. MacDonald (2000) suggests that profiling can be considered *hard* or *soft*. *Hard profiling* occurs when race is the one and only factor used in police decisions to stop a particular motorist. *Soft profiling* occurs when race is one of several factors the police use in determining whom they stop.

Collecting Data

Many departments have, independently or in collaboration with others, undertaken the task of analyzing traffic stop data. These agencies vary in terms of their structure and function, as well as in the type of data they collect. In addition, some data collection efforts involve sophisticated data analyses where others simply compare basic percentages. These differences, on the surface, are not all that dramatic. When making conclusions about the practices of a department, however, these methodological considerations take on more importance. In fact, methodological considerations are considered paramount by prevailing judicial opinions (see following discussion on legal issues). It should be noted; however, just as there are no widely accepted standards for defining racial profiling, the methods of collecting and analyzing traffic stop data are not universal.

Police departments across the country collect a variety of data elements in their analysis of racial profiling. Some agencies collect a minimal amount of data such as the race, age, and gender of the driver, along with the reason for, and outcome of the traffic stop. Other agencies collect data pertaining to all passengers of the vehicle, key events that may occur during a traffic stop (e.g. warrant check, search), and police officer demographics. There appears to be no

consensus regarding the most appropriate data collection elements across departments. The National Institute of Justice (NIJ), however, recommends certain data be collected on a "routine" basis (Ramirez, McDevitt & Farrell, 2000). These data elements include: date, time, and location of stop, license number and description of vehicle, length of stop, and name and identification number of the officer initiating the stop. The NIJ also recommends that certain "study specific" variables be considered. These include the race, date of birth and sex of the driver, the reason for stop; the outcome of the stop, and whether or not a search was conducted.

This report summarizes the analysis of traffic stop data collected by the LPD for the period January 15, 2001 to December 31, 2001. The report begins with a brief discussion of the background of the study. Next, the report provides a detailed discussion of the data analysis process and findings. Finally, the report concludes with recommendations for the future data collection and analysis efforts.

Background

In December 2000, the Louisville Division of Police (LPD) adopted a policy strictly prohibiting the practice of profiling. In conjunction with this policy, LPD decided to collect traffic stop data to monitor compliance with the policy. During the period January15 - March 15, 2001, LPD opted to conduct a three-month pilot study of traffic stops. The purpose of the pilot study was to identify issues that may adversely impact the documentation of traffic stops as well as factors related to the input and analysis of data that might be of concern. Upon completion of the two-month review, the LPD decided to continue the study for the remainder of the year.

In August 2000, the Louisville Division of Police began to formally examine the issue of racial profiling. In an effort to gather information about this issue, representatives from LPD attended two training seminars. The first was the 11th Annual Regional Law Enforcement

Executives' Training Conference held in St. Louis, MO in August 2000. The second was the National Symposium on Racial Profiling and Traffic Stops sponsored by the Northwestern University Center for Public Safety in September 2000. At these training conferences, LPD representative consulted with numerous law enforcement agencies, researchers, and representatives from the Rainbow/Push Coalition, the American Civil Liberties Union, and the U.S. Department of Justice.

Upon returning from these conferences, selected LPD officers were tasked with creating a community-based committee that would address issues relating to racial profiling. Specifically, the Profiling Committee was charged with making recommendations to the LPD in regard to the development of a departmental anti-profiling policy. In addition, the committee was asked to provide recommendations regarding the specific content and procedures for the collection of traffic stop data. The department formed a committee consisting of LPD staff, representatives from the local ACLU and NAACP chapters, and two representatives from Citizens Against Police Abuse (CAPA), and researchers from the University of Louisville. The committee discussed information gained from a variety of sources including training conferences, research reports, other law enforcement agencies, and community members. The committee also considered the feasibility of various data collection instruments and issues related to a variety of research methodologies. The committee closely examined two pre-existing data collection instruments utilized by the Sacramento, CA Police Department and the St. Louis, MO Police Department. Also, the committee relied heavily on a racial profiling data collection resource guide prepared by the National Institute of Justice (NIJ) in developing the LPD data collection form.

In early December 2000, the recommendations of the committee were forwarded to Chief Greg Smith. On December 5, 2000 LPD instituted a policy prohibiting profiling and finalized the content of the data collection instrument. A copy of the policy is contained in Appendix A. The policy includes a definition of profiling, procedures for collecting data during traffic stops, supervisor responsibilities, training, reporting, and disciplinary procedures. According to the LPD policy, profiling is defined as:

> "The targeting of people based solely on their race, ethnicity, gender, sexual-orientation, religion, socioeconomic status, or disability; or a process that motivates the initiation of a traffic stop, detention, and/or other law enforcement activity based solely on an individual's actual or perceived race, ethnicity, gender, sexual orientation, religion, socio-economic status, or disability, or other characteristics attributed to an individual as a member of such group; or making discretionary decisions during the course of an enforcement activity based upon race, ethnicity, gender, sexual orientation, religion, socio-economic status, or other characteristics attributed to an individual as a member of such group." (Chapter 3, Section III, Article 98, LPD Policy & Procedure Manual)

LPD provided selected Commanding Officers with training that addressed historical aspects of racial profiling, the new LPD policy prohibiting profiling, the procedures for completing the vehicular stop data collection forms, and the role of supervisory personnel in the data collection effort. Commanding Officers were selected for training based on their likelihood of involvement in the managing and supervising of vehicular data collection processes. Line officers received instructions and training about the new policy and the data collection procedures from personnel within their district, bureau or division. Also, LPD instituted a 40-hour mandatory in-service training program for all sworn officers. This training addresses issues relating to profiling such as cultural diversity training, policies and procedures of LPD in regard to the prohibition against profiling, instructions for completing the vehicular stop data collection form, traffic stops procedures, use of in-car video cameras, and techniques of the Verbal Advantage Program.

## Methods

Data Collection and Variables

Based on recommendations of the committee, LPD coordinated further development of the data collection form with the Scantron Corporation. The form contains numerous data elements and is two-sided. A copy of the form is contained in Appendix B. The form includes data relating to:

- Time of stop
- Date of stop
- Reason for stop
- Race of driver
- Sex of driver
- Driver year of birth
- Drivers license number & state
- Was driver a city resident?
- Was driver asked to exit car?
- Number of passengers in car
- Was a search of the driver, passenger or vehicle conducted?
- Probable cause/authority for search
- Was contraband discovered?
- Type of contraband discovered
- Approximate duration of search
- Was a warrant check performed?
- Was there a hit for the warrant check?
- Time of delay while performing warrant or license check
- Result of the traffic stop/search
- Citation number
- Violation/stop location
- Was violation/stop location within city limits?
- District where violation/stop occurred
- Beat where violation/stop occurred
- Vehicle license plate number & state
- Duration of the stop
- Was vehicle equipped with video camera?
- Officer code
- Supervisor code

LPD began collecting traffic stop data on January 15, 2001. The forms are completed by individual officers who make the traffic stop and are reviewed by their supervisors. Once the

district supervisors complete their review, the forms are forwarded to the Staff Services department located at LPD headquarters. Staff Services personnel again review each form for completeness and accuracy. Forms that contain errors or incomplete information are returned to the district for corrections.

Once the forms are delivered to the university, the forms are separated from any additional documentation. Usually, additional documentation consists of a copy of the citation that was issued to the driver but also includes field interview cards and safety inspection forms. The data from the Scantron forms are scanned directly into a Scanbook database. The database file is then converted to the Statistical Package for Social Science (SPSS) 11.0. SPSS is the statistical program that is used to conduct the data analysis. It takes, on average, two seconds to feed one form through the machine. The machine does have an auto-feed option; however, forms often jam or are rejected by the machine. Because of these problems forms were sorted into groups of 50, and then manually fed into the machine. Recounting each scanned form and visually checking the new database entries verified entry of each form. When forms are rejected or become jammed, the form is removed from the current batch. The forms are then checked to determine the reason for scan failure. Over 1000 forms were rejected or jammed. Forms that are complete and/or correct are re-scanned. Forms that contain incomplete or incorrect data, as well as forms that are rejected, are returned to the LPD for further processing. The most typical problems encountered in the scanning of the forms involve torn, stapled, or stained (e.g. coffee stains) forms and forms with missing data for one or more of the first five data elements. The missing data typically involves failure of the officer to record both written and bubbled entries for items such as time of stop, date of stop or violation code.

Collection and Measurement Concerns

The analysis consisted of multiple steps. Given the number of cases and the number of variables, this approach was necessary for accuracy and efficiency. First, data were analyzed descriptively to give an overall picture of tendencies. This entailed calculating percentages of drivers within each decision point (reason for stop, asking the driver to exit, conducting a search, conducting a warrant check, and outcomes). One caveat is that the stop outcomes/results were dictated by events during the duration of the stop. For example, an officer stops a driver for an equipment/registration violation, but during the course of the stop sees contraband in the backseat of the car. Good police practice would dictate that the officer then conduct a search and run a warrant check. If there is an outstanding warrant on the driver, the officer must then arrest the driver. Thus, there are several decision points throughout the traffic stop process that involve no officer discretion. The officer must follow policies and procedures. In purely descriptive analyses of the data, these intricacies can become obscured.

The descriptive analyses were conducted to paint a broad picture of traffic stop activity. Subsequently, more sophisticated analyses were conducted that considered the totality of the circumstances surrounding the stop. Chi-squared automatic interaction detector (CHAID) analysis examined each decision point and determined the ability of various driver demographics (race, sex, and age) to predict those decisions. For example, CHAID analysis would sort all 10,000 cases in terms of whether or not an officer conducted a search. Then, the program checks those decisions (search/no search) with consideration of the driver demographics. Each case in which there was a decision to search is examined in terms of the driver's race, sex, and age. The same is done for cases in which the decision was not to search. This insures that the impact of each demographic variable is considered based on whether or not a search was conducted. In

this way, the CHAID analysis can determine the variable most predictive of a particular decision. Whenever race, sex, or age of the driver is a significant predictor of a particular decision, those factors will appear on a "decision tree," along with measures of their strength and predictive value. If these demographics were not significant predictors, no "branches" would appear on the decision tree. In this case, it is highly likely that factors other than driver race, sex, or age were more strongly related to an officer's decision (such as the presence of contraband, reason for stop, odor of alcohol or drugs, etc.). A summary of the findings from the descriptive analyses is presented below, followed by a summary of the findings from the CHAID analysis.

## Analyses & Results

Overview of Traffic Stops

Traffic stops generally follow fairly predictable patterns. For example, stops are most likely at certain times of day, certain days of the week, certain days of the year, and in certain months. Weather patterns may play a role in traffic stops, as well. Situations in which patrols are increased, such as during Derby festival events, may result in more stops.

In Louisville, traffic stops during this study period were characterized by the following:

- Most drivers (14%) were stopped between the hours of 4:00 PM and 6:00 PM. Fewest drivers (< 1%) were stopped between the hours of 5:00 AM and 6:00 AM.
- The second shift was the busiest, making 46% of all stops.
- Less than two-thirds of the drivers stopped were city residents (63%), over one-third (37%) were not.
- Most drivers stopped were male (70%).
- Drivers between the ages of 24-40 were most often stopped. As driver age increased, their likelihood of being stopped decreased. Interestingly, the youngest drivers were the least likely to be stopped.
- Most drivers stopped were White (64%); 33% were Black, and 3% were Hispanic or other.

- White males were less likely than other males, and white females were more likely than other females to be stopped.

Officer decisions in Louisville were characterized by the following:

- The most frequent reasons for stops were: 1) violations of the penal code (67%); 2) equipment/registration violations (20%); and 3) misdemeanor violations of the penal code (7%).

- Higher percentages of non-white drivers were asked to exit, were searched, had warrant checks, and were arrested. Higher percentages of non-white drivers, however, also had hits on warrant checks, had contraband, and received warnings. A greater percentage of white drivers than non-white drivers received citations.

- A search was conducted in about 17% of all stops. Over half of all searches were incident to arrest (52%); 40% were consent searches; 19% involved the odor of drugs/alcohol. (Adds to more than 100% because officers could indicate multiple reasons).

- Contraband was discovered in 31% of all searches.

- Warrant checks were performed almost routinely, in 78% of all the stops.

- The most common stop outcome was a vehicle violation (43%).

- Most stopped drivers (67%) were issued citations, 14% were warned, and 11% were arrested.

In general, decisions to stop a driver were characterized by situations in which very little officer discretion was used. That is, most stops were initiated because of penal code violations and equipment/registration violations. Subsequent officer decisions seem to be related to situations that arose during the stop, such as the odor of drugs/alcohol, warrant hits, the discovery of contraband, and policies/procedures related to the apprehension and arrest of individuals. Most drivers were guilty of vehicle violations for which they received citations.

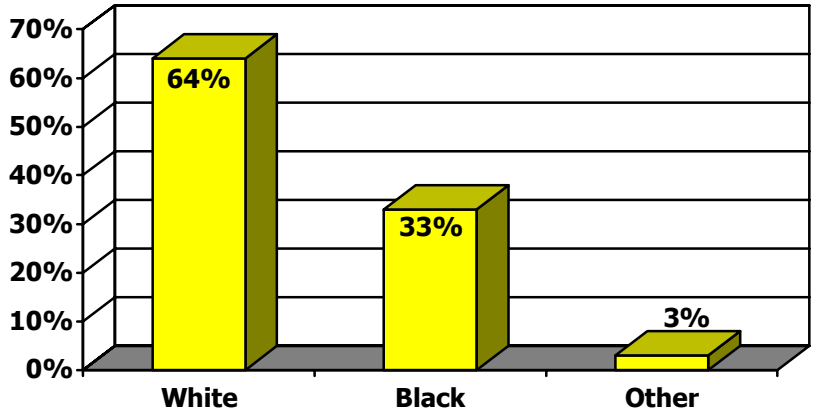
Descriptive Analyses and Results

Driver Demographics

The variables related to the driver involved in the stop were the following: race, sex, age, and residency. Drivers stopped were mostly White (64%), male (70%), between 24-40 years old, and Louisville residents (63%).

Race. As indicated below, 64% of the drivers stopped were White, 33% were Black, and 3% were Other (including Hispanic). (See Table 1).

Table 1: Percentage of Stops by Race of Driver




Sex: Sex by Race. Most (65%) stopped drivers were male (See Table 2). A higher percentage of Non-White males than White males were stopped, whereas a higher percentage of White females than Non-White females were stopped (See Table 3).

Table 2: Percentage of Stops by Sex of Driver

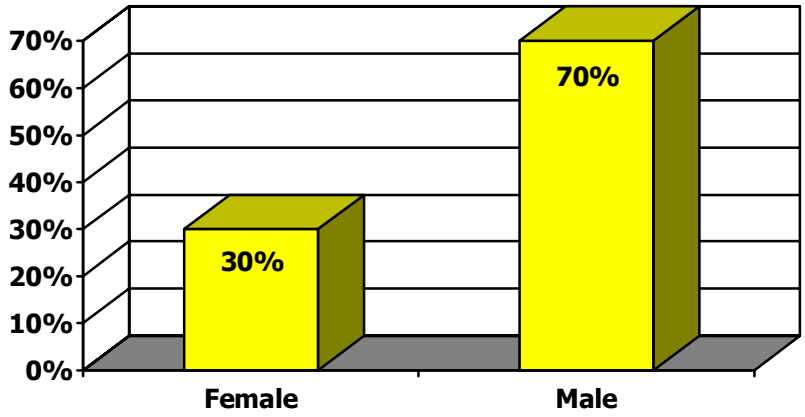
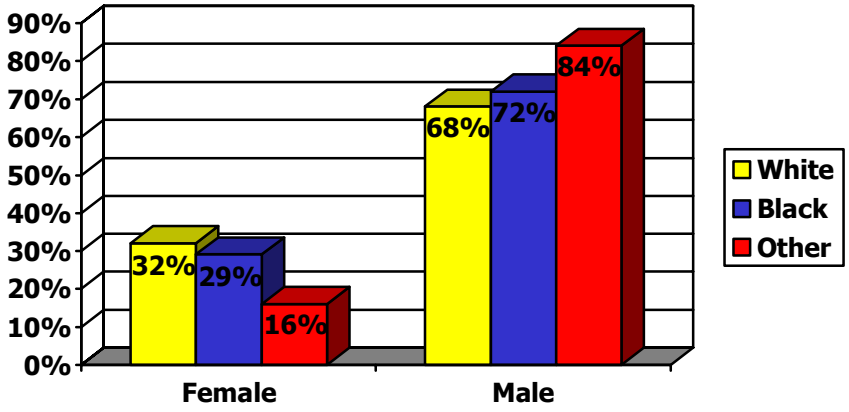



Table 3: Percentage of Stops by Sex and Race of Driver




Age: Age by Race. The median age of drivers stopped was 30, with most stopped drivers being 21. Drivers under 18 were stopped least frequently (See Table 4). Higher percentages of Black drivers than White or Other drivers between the ages of 18 and 23 were stopped, but in the 24-40 age group, other persons of color were most likely to be stopped. In general, younger (under 24) and older (over 40) White drivers than all other drivers were most likely to be stopped (See Table 5).

Table 4: Age Categories of Drivers Stopped

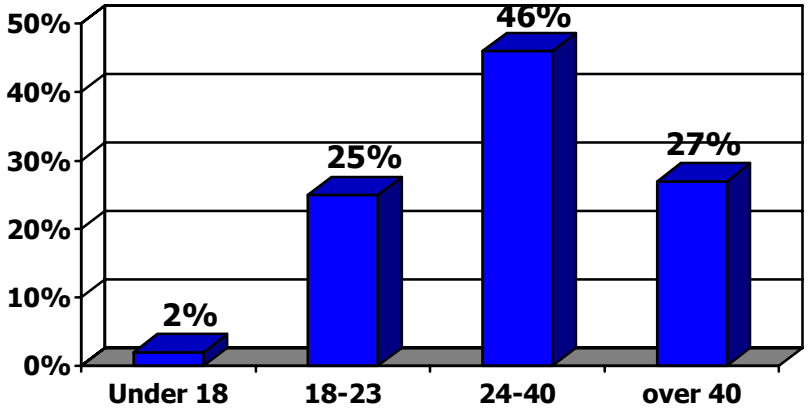
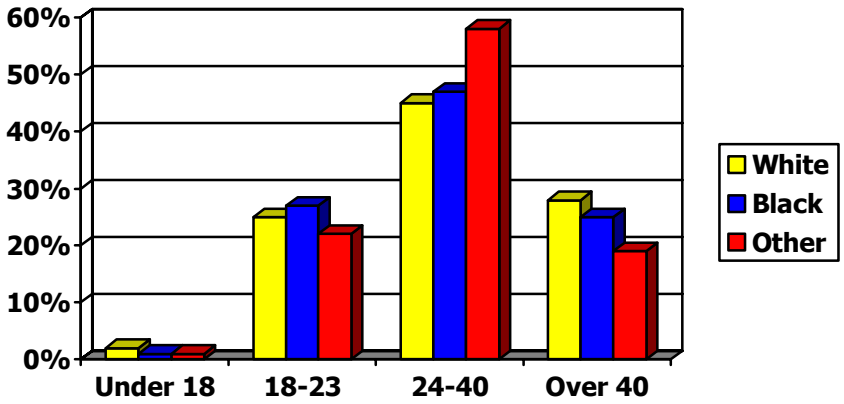
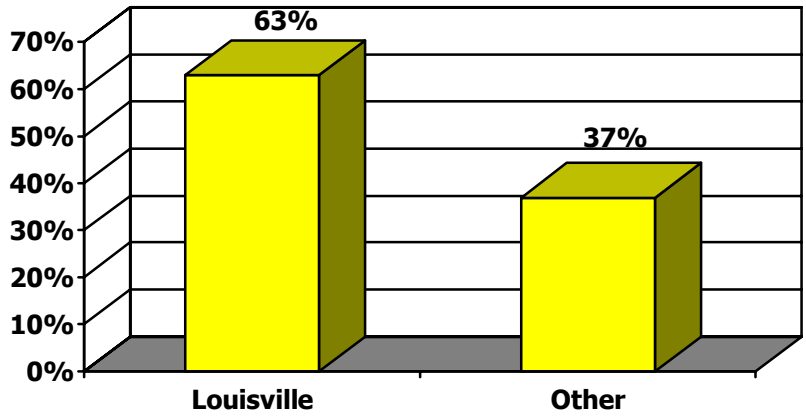



Table 5: Percentage of Drivers Stopped by Race and Age




Residency. Of all drivers stopped, less than two-thirds (63%) were city residents (See Table 6). This is probably very characteristic of a major urban area with a significant proportion of commuters and numerous institutions of higher learning. Given this, city census figures should NOT be used as a baseline for comparison to the overall stop data.

Table 6: Percentage of Drivers Stopped by Residency




Stop Event

Temporal Distribution. It was not feasible to determine stops by month given that a large portion of the date information was either missing, inaccurate, or incomplete. The least active time for stops was between 5am and 8am (about 4% of all stops), with the time between 4pm and 6pm the most active time (about 14% of all stops) (See Table 7). As a result, the second shift was responsible for the most stops (46%), followed by the third shift (30%), and the first (24%). (See Table 8).

Table 7: Percent of Stops by Hour of Day

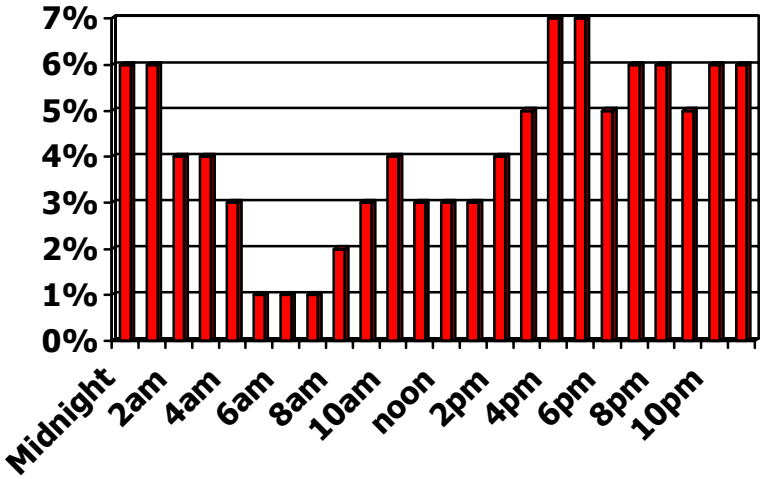
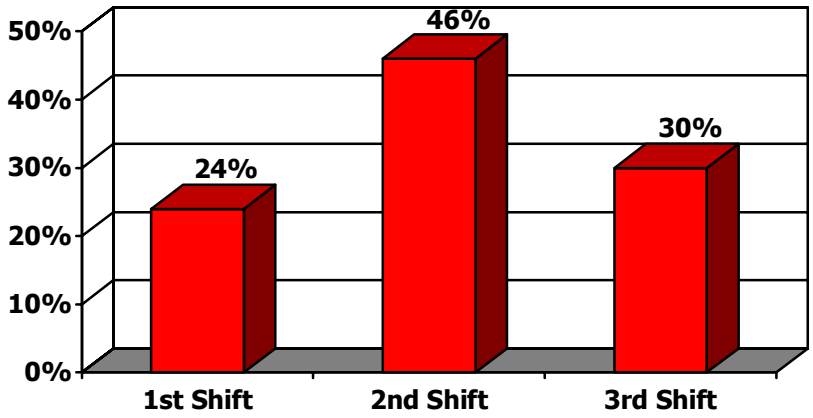


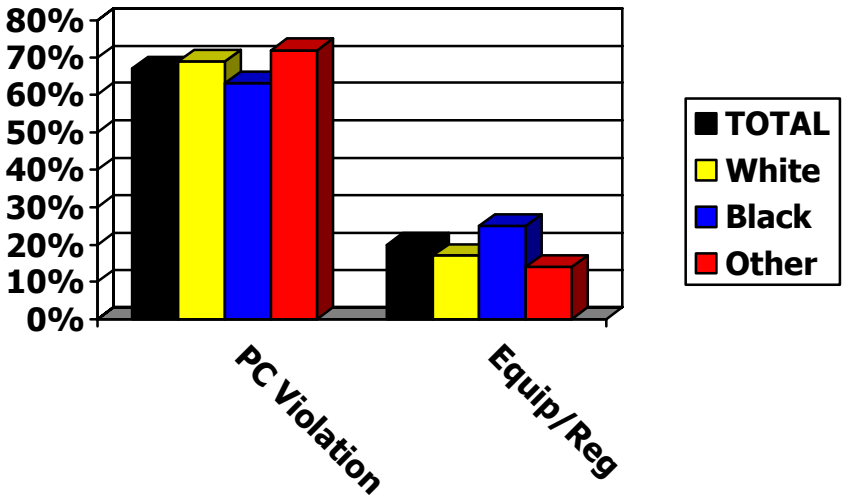
Table 8: Percent of Stops by Shift




In general, drivers were stopped for violations of the penal code (67%) or equipment/registration violations (20%), were not asked to exit their vehicles (81%), were not searched (83%), and were issued citations (67%). In 19% of the stops, drivers were asked to exit their vehicles, and 17% of stops involved a search. Searches mostly were conducted incident to arrest (52%), followed by consent (40%). Contraband was discovered in about 5% of all stops (but in 31% of all searches), with the most likely type of contraband being drugs (4%).

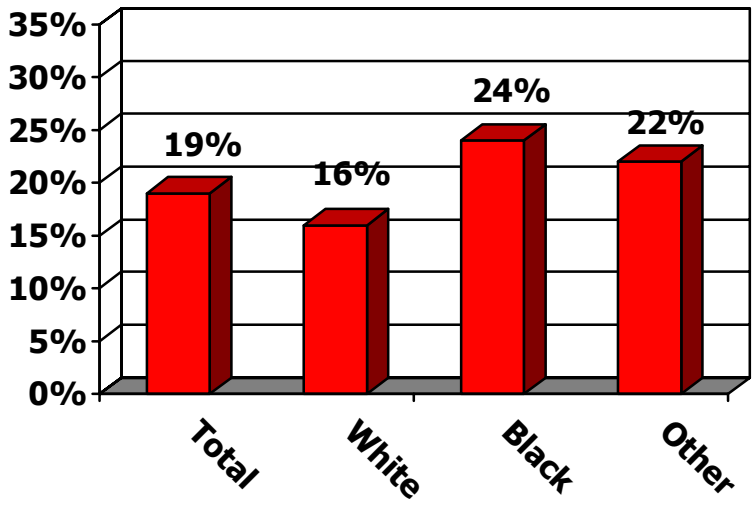
Reason for Stop by Race. The two most-cited reasons for stops were: 1) penal code violations (67%) and 2) equipment/registration violations (20%). Stops of Other drivers (72%) were more likely than stops of White (69%) or Black drivers (63%) to involve a violation of the penal code. Twenty percent (20%) of all stops were for equipment/registration violations; stops of Black drivers (25%) were more likely than stops of White (17%) or Other drivers (13%) to involve this reason. (See Table 9).

Table 9: Percentage of Stops by Reason and Race of Driver



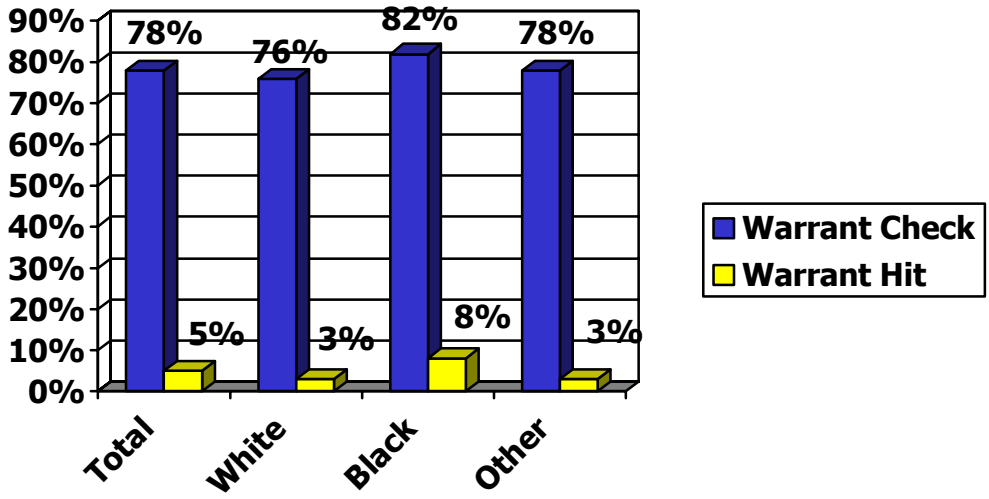

Being Asked to Exit by Race. In 19% of the stops, the drivers were asked to exit their vehicles. Black drivers (24%) were more likely than Others (22%) or White drivers (16%) to be asked to exit. (See Table 10).

Table 10: Percent of Drivers Asked to Exit by Race



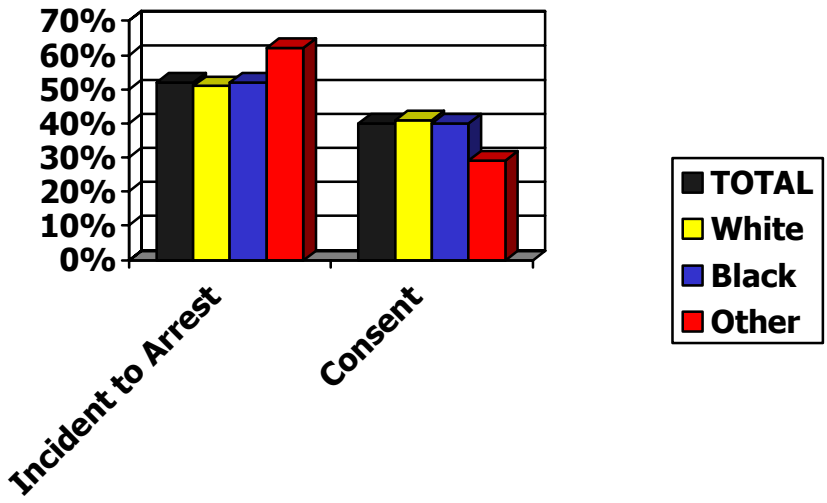
Warrant Checks and Hits by Race. Conducting a warrant check on stopped drivers was almost routine. Over three-quarters (78%) of stops involved a warrant check. Black drivers (82%) were more likely than Other drivers (78%) and White drivers (76%) to be checked for outstanding warrants. However, Black drivers also were more likely to have hits on warrant checks; 8% of Black drivers, compared to 3% of White drivers and 3% of Other drivers had hits on warrant checks (See Table 11).

Table 11: Percent of Warrant Checks and Warrant Hits by Race



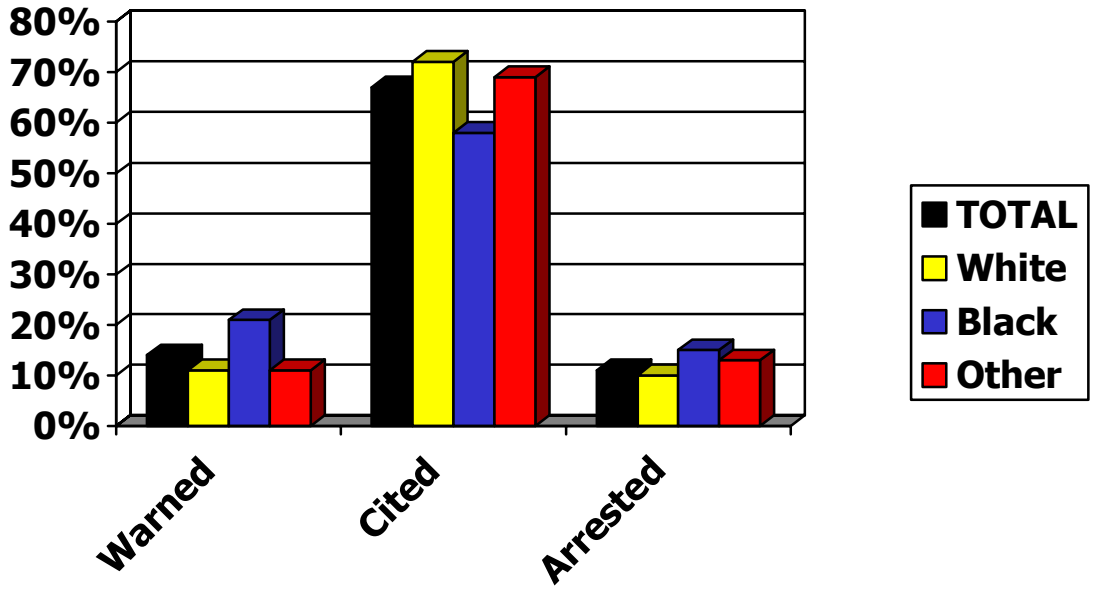

Searches by Race. About 17% of all stops involved a search. Most searches (52%) were conducted incident to arrest. Of drivers searched, Other persons of color (62%) were more likely than Black drivers (52%) and White drivers (51%) to be searched for this reason. Consent to search was given in 40% of cases, more so by White (41%) and Black drivers (40%) than by Other drivers (29%) (See Table 12).

Table 12: Percentage of Searches by Type and Race of Driver




Outcome of Stop by Race. Black drivers (21%) were more likely than White drivers (11%) and Other drivers (11%) to be issued a warning as a stop outcome (See Table 13). White drivers (72%) were more likely than Other drivers (69%) or Black drivers (58%) to be issued citations. A higher percentage of Black drivers (15%) than Other drivers (13%) or White drivers (10%) had arrest as the outcome of their stop.

Table 13: Percentage of Drivers Stopped By Outcome and Race



Summary of Descriptive Analyses

At first glance, one might be tempted to conclude that race is a factor in some events. For example, higher percentages of Other drivers of color were stopped for penal code violations while higher percentages of Black drivers were stopped for equipment/registration violations.

Descriptive statistics, however, are very superficial and only give the broadest picture of the data. This type of analysis lacks inferential ability. One cannot use it to predict events or to describe the relationships among characteristics and events. Descriptive statistics only should be used to describe the state of affairs. They will not help to: 1) understand why the percentages are the way they are; 2) determine the relationships among the characteristics and events; 3) predict one outcome or event over some other outcome or event.

Providing a description of the data should only be the first step in a thorough analysis. More comprehensive multivariate analysis is required to understand the relationships between and among variables, and to understand how these variables interact with one another to produce a certain reality, as portrayed by the descriptive statistics. In this case, a procedure called chi-square-automatic interaction detector (CHAID) was used to more fully explore the relationships between and among the various variables.

CHAID Analyses

This portion of the report examines the relationship between three demographic predictors (age, race, sex), and several events related to the initial stop. These events involve the following questions:

1) Reason for the Stop?
2) Was the driver asked to exit the vehicle?
3) Was a search conducted?

4) Was a warrant check performed?

5) Stop outcome (warning, citation, or arrest)?

Some of these decision points also were examined as predictors of subsequent events. For example, whether a warrant check was conducted might be related to whether a driver was warned, cited, or arrested.

CHAID is based on an analytical technique called chi-square. Chi-square analysis demonstrates whether a particular observed proportion within a sample is statistically different from a particular expected proportion within that sample. The expected proportion is based on the premise that there is no relationship (i.e., one has no impact on the other) between the two variables in question within the population from which the sample under study was drawn. It is calculated using information from the entire group.

For example, if we were interested in whether race (White, Other) and being arrested (Yes, No) are related in a population, we would use chi-square analysis. The chi-square procedure would determine that 25% of all the persons (regardless of race) were arrested and 75% were not. Then, the chi-square procedure would determine that, of all the "Other" drivers, 30% were arrested. Chi-square analysis would then conclude whether the 5% difference between all persons arrested and "Other" persons arrested is attributable to chance, or whether it is likely that there is a true difference in the population between White and Other drivers in being arrested. If the chi-square value is "statistically significant," this 5% difference is not attributable to chance and represents a true difference between White and Other drivers in being arrested. By convention, statistical significance is reached when the probability of error in this conclusion is less than .05 (i.e., only 5 times out of 100 would one reach this conclusion in error).

Race, however, is just one factor that could be related to any event in a stop situation. Other variables may be more important. They may mediate, or even eliminate the influence of race. This is why we use a "measure of association" called the "phi coefficient" with chi-square analysis. The phi coefficient ranges in value from 0 (no relationship) to 1 (perfect or very strong relationship). If chi-square analysis indicates statistical significance (that the 2 variables are related), it is then necessary to determine the strength of that relationship. In the previous example, the 5% difference in the proportion of Black drivers arrested and the proportion of all drivers arrested was statistically significant. The question now relates to how strong the relationship is between race and arrest. The chi-square analysis determines the phi coefficient for this relationship to be .03. This indicates an extremely weak, almost non-existent relationship between race and arrest because .03 is much closer to 0 than to 1. In fact, this means that very little variation in arrest is explained by the race of the driver. Another variable or set of variables is more influential in arrest than the race of the driver. This is where it becomes necessary to conduct multivariate analysis.

CHAID is a multivariate technique that segments the sample of traffic stops and reveals the interrelationship between the potential predictors and the events involved in the stop. The CHAID procedure generates a "decision tree" that identifies significant predictors or each decision in question. In effect, the procedure "cross-references" each event with each potential predictor.

CHAID simultaneously considers the impact of several independent variables (age, race, sex) upon a particular event in question (arrest, in the example above). The CHAID results indicate the strongest predictor of the event, while taking the other variables into account. It may be that no variable or set of variables is a predictor of the event when the other variables are

considered. This means that any original relationship (e.g., between race and arrest) is so weak that when other independent variables are considered (age, sex), nothing predicts the event.

In the arrest example, the program examines all the cases in which individuals were arrested. It then examines all the factors associated with each case and determines the ones that keep occurring in conjunction with an arrest. Then, the program compares that state of affairs with the cases in which drivers were NOT arrested. In this way, it is possible to determine whether factors are really predictive of an event or whether observed differences between those arrested and those not arrested occurred purely by chance.

For example, if descriptive analysis determines that 30% of the drivers arrested were White and 70% were Black, one might be tempted to conclude that there was a racial bias in arrests. However, the CHAID analysis would examine the cases and simultaneously consider all the other potential factors involved in an arrest. The decision tree that it generates might indicate that the most significant factor related to arrest is a stop for "pre-existing knowledge." The analyses demonstrate which of the potential predictors (if any) had the strongest and most important relationship to the events or outcomes. In this case, the potential predictors were used to examine the five events listed above to determine if they were actually related or whether any observed differences occurred purely by chance.

The advantage of multivariate analysis is that it reveals the strongest predictors of the event in question. In other words, if race is a factor, it will emerge independently of the other factors. If race is not a factor, then the one or more of the other predictors will emerge, or none of the selected predictors will emerge as related to the events/outcomes. If no significant predictor emerges, it either means that the analyses did not include the most relevant predictors or that no measured factor is related to the event.

This attribute is particularly relevant for a traffic stop situation in which many things go unmeasured. For example, one cannot measure the quality of the personal interactions between an officer and the individuals stopped. One cannot measure the demeanor of the driver. In this case, one cannot measure any information about the passengers in the vehicle. Finally, extraneous factors such as the weather, the time of year, the social environment, and the location are not measured in this study.

CHAID Results

Results from CHAID analyses resulted in 5 events with significant predictors. Within "Reason for Stop," being stopped for a penal code violation was significantly related to race of the driver. Being asked to exit, being searched, being subject to a warrant check, and being arrested all were predicted by having been stopped for a misdemeanor. Sex and age also surfaced as second or third order predictors in some situations.

Reason for Stop.

Only two "reasons for stop" had enough cases to use with CHAID, Penal Code Violation, and Equipment/Registration Violation:

- Penal Code Violation: This reason for stop was given in 67.3% of all stops (32,509/48,306). This is the "base rate" for penal code violations.
    - ✓ Race was the strongest predictor.
        - Other Persons of Color (1109/1541 = 72%) and
        - Whites (21,115/30,481 = 69.3%) were stopped for this reasons in proportions higher than the base rate of 67.3%.
    - ✓ Among Other Persons of Color, the next predictor was Age:
        - Persons over 40 (221/286 = 77.3%).
    - ✓ Among Whites, the next predictor was Age:
        - Persons under 18 (484/630 = 76.8%).

Therefore, in percentage order, the groups that had significantly higher percentages of penal code violations than the base rate were:

1. Other Persons of Color over 40: 77.3%.
2. Whites under 18: 76.8%.
3. Other Persons of Color: 72%.
4. Whites: 69.3%.

Here, the age interaction was more important than the race factor, given that certain age groups among the races were more likely to be stopped for penal code violations rather than just certain races.

- No demographic factors were related to Equipment/Registration Violation: 19.5% of the stops were for this reason (9,475/48,586).

The following "reasons for stop" were too small (infrequent) to conduct CHAID analysis.

- Felony (Penal Code): Only 0.5% of the stops were for this reason (249/48,586).
- Misdemeanor (Penal Code): 7.1% of the stops were for this reason (3,458/48,586).
- Violation of City Ordinance: 1.7% of the stops were for this reason (832/48,586).
- Pre-existing knowledge/investigation: 2.8% of the stops were for this reason (1,350/48,586).
- Special Detail: 1.0% of the stops were for this reason (482/48,586).
- Crime Initiative: 0.6% of the stops were for this reason (302/48,586).
- Traffic Checkpoint: 0.1% of the stops were for this reason (25/48,586).
- Assistance: 2.1% of the stops were for this reason (1,043/48,586).
- Other Reasons: 1.7% of the stops were for this reason (815/48,586).

Driver Asked to Exit. At this point, three initial reasons for stop (felony, misdemeanor, violation) were added to the demographics (age, race, sex) as potential predictor variables. The base rate for "Driver Asked to Exit" was 18.9% (8,937/47,247).

- ✓ Whether the person had been stopped for a Misdemeanor was the strongest predictor (1,693/3,383 = 50%).

- Among persons stopped for a Misdemeanor, the next strongest predictor was Sex. Males were asked to exit the car at the highest rate (1,450/2,675 = 54.2%).

    - ❖ Among males stopped for a misdemeanor, the next strongest predictor was a stop for a Violation (146/211 = 69.2%).

In percentage order, the groups that were significantly above the base rate for "Driver Asked to Exit" were:

1. Males who were stopped for both a misdemeanor and a violation: 69.2%.
2. Males stopped for a misdemeanor: 54.2%.
3. Persons stopped for a misdemeanor: 50%.

Therefore, the CHAID analysis revealed that the reason for stop (misdemeanor, violation) and sex were strong predictors of driver being asked to exit.

Search Conducted. The base rate for searches conducted was 16.4% (7,846/47,613).

- ✓ The strongest predictor was Misdemeanor stop. A greater proportion of persons initially stopped for a misdemeanor (1,621/3,436 = 47.2%) were searched.

    - Among persons stopped for a misdemeanor, the next predictor was Sex. Males (1,422/2,713 = 52.4%) were searched at a higher rate than females.

        - Among persons stopped for a misdemeanor who were male, the final predictor was Violation stop. A greater proportion of persons initially stopped for a violation (157/221 = 71%) were searched.

In percentage order, the groups that were significantly above the base rate for searches were:

1. Males who were stopped for both a misdemeanor and a violation: 71%.
2. Males stopped for a misdemeanor: 52.4%.
3. Persons stopped for a misdemeanor: 47.2%.

Therefore, the CHAID analysis revealed that the reason for stop (misdemeanor, violation) and sex were strong predictors of whether a search was conducted.

Warrant Check. The base rate for having a warrant check performed was 77.8% (37,394/48,058).

- ✓ The strongest predictor was Misdemeanor stop. A greater proportion of persons initially stopped for a misdemeanor (2,987/3,455 = 86.5%) had warrant checks.
    - Among persons stopped for a misdemeanor, the next predictor was Sex. Males (2,416/2,732 = 88.4%) had warrant checks.
        - Among persons stopped for a misdemeanor who were male, the final predictor was Age. A greater proportion of persons aged 24-40 (1,135/1,270 = 89.4%) had warrant checks.

In percentage order, the groups that were significantly above the base rate for having a warrant check were:

1. Persons stopped for a misdemeanor who were male and age 24-40: 89.4%
2. Males stopped for a misdemeanor: 88.4%.
3. Persons stopped for a misdemeanor: 86.5 %.

Therefore, the CHAID analysis revealed that the reason for stop (misdemeanor), sex, and age were strong predictors of whether a warrant check was conducted.

Arrest. The base rate for arrests was 11.3% (5,501/48,586).

- ✓ The strongest predictor was Misdemeanor stop. A greater proportion of persons initially stopped for a misdemeanor (1,308/3,458 = 37.8%) were arrested.
    - Among persons stopped for a misdemeanor, the next predictor was Violation stop. Persons also stopped for a violation (173/286 = 60.5%) were arrested at a higher rate.
        - Among persons stopped for a misdemeanor who were also stopped for a violation, the final predictor was Race. Whites (111/160 = 69.4%) were arrested at a higher rate.

In percentage order, the groups that were significantly above the base rate for arrests were:

1. Persons stopped for both a misdemeanor and a violation who were white: 69.4%
2. Persons stopped for a misdemeanor and a violation: 60.5%.
3. Persons stopped for a misdemeanor: 37.8 %.

Therefore, the CHAID analysis revealed that the reason for stop (misdemeanor and violation) and race were strong predictors of arrest.

There were no significant predictors of being issued a citation or receiving a warning as a stop outcome. This means that no variable or combination of variables made a person more or less likely than any other person to receive a citation or a warning.

Summary of CHAID Analyses

Five events involved significant relationships to tested predictors. Being stopped for a penal code violation, being asked to exit the vehicle, being searched, being subject to a warrant check, and being arrested were the only events that CHAID analysis determined to have significant relationships with predictor variables. In no situation was race the only or most significant predictor of an event. When race did surface, it was strongest in combination with other variables, such as age (in the case of being stopped for a penal code violation), or reason for stop (in the case of arrest). Moreover, Other persons of color and Whites were the only racial groups to appear as significantly related to any of the stop events: 1) being an Other person of color over 40 and being a White person under 18 were strongly related to being stopped for a penal code violation; and 2) being a white person stopped for both a misdemeanor and a penal code violation was strongly related to being arrested. Being stopped for a misdemeanor surfaced as a significant predictor more often than any other factor. Sex of the driver (being male) also was related to being asked to exit, being searched, and being subject to a warrant check.

## The "Baseline" Dilemma

The most problematic part of any study of this nature is determining the baseline to which collected data should be compared (Engel, Calnon, and Bernard, 2002). Many studies only compare the rate of stops among various racial groups and use any disparity to infer the

presence of discriminatory stop practices. Engel, Calnon, and Bernard (2002), however, argue that "the mere presence of disparity in the aggregate rate of stops does not, in itself, demonstrate racial prejudice, any more than racial disparity in prison populations demonstrates racial prejudice by sentencing judges" (p. 250).

We should look at "what is" and compare that state of affairs to "what should be." However, determining "what should be" is troublesome. In theory, the racial distribution of drivers stopped should represent the racial distribution of drivers doing something that makes them eligible to be stopped. For example, if 20% of the drivers doing something that makes them eligible to be stopped by the police are Black and 80% are White, one would expect that 20% of the drivers stopped are Black and 80% are White. This comparison has very little, if anything, to do with any racial distribution in the city or county population. It has everything to do with the racial distribution of drivers on the roadways and the driving behaviors or characteristics that they exhibit.

Making decisions as to whether a department is engaging in discriminatory stop practices depends on the ability to identify the racial distribution of stops that would exist in the absence of discriminatory stop practices. That is, one must know the true racial distribution of drivers eligible to be stopped (i.e., doing anything that could get them warned, cited, or arrested—anything that creates reasonable suspicion or probable cause). Stops in the absence of discriminatory practices, then, would be the "right" proportions. One could then compare the research findings to the "right" proportions to determine whether discrimination exists. Unfortunately, we cannot measure this objective reality. Determining the "right" proportion of stops is impossible because of the infinite variations in driving behaviors and police response within various locations at various times on various days in various months during various years.

Also missing is a measure of the interactions between those stopped and the officers. Demeanor is thought to significantly contribute to stop outcome as well as to other law enforcement outcomes such as warning, citation, and arrest.

This reality, however, is extremely difficult, if not impossible, to measure. We cannot know the racial distribution of drivers doing something that makes them eligible to be stopped. Some research has attempted to measure this, but the methodology employed is often seriously flawed. The most common method involves posting trained observers at strategic locations armed with stopwatches to determine the racial distribution of speeders. Obviously, this method is extremely limited, relying on split second judgment by observers as to the race of drivers. In addition, this method rests on the assumption that speeding is the only thing for which drivers get stopped. In the current study, moving violations were the most commonly cited reason for a stop, but equipment/registration violations and other violations accounted for about 3 in 10 stops. Given that comparison to population data is invalid (see Engel, Calnon, and Bernard, 2002 for an excellent critique of this practice), we suggest that the current data become the baseline from which to evaluate future practices.

The initial analysis of a law enforcement agency's traffic stops does establish a benchmark for that department. Once an initial study is completed, a department has an empirical basis for comparison in the future. If an initial study indicates the possibility of bias (race appears as a significant predictor of some event), future research will provide data for comparison to help determine whether the relationship previously observed between race and some outcome persists or whether it has disappeared. If an initial study shows no evidence of bias (race does not appear as a significant predictor of any outcome), the department in question should attempt to maintain this desirable result.

These data, collected from traffic stops made by the Louisville Division of Police between January 15 and December 31, 2001, provide no evidence that the LPD is systematically engaging in discriminatory stop practices. Stops conducted by the Department, as a whole, during the study period, do not involve the race of the driver, independently, as the most significant factor related to events and outcomes (e.g., arrest, search, etc.). This does not mean, however, that no individual citizen ever was discriminated against. There is always the possibility that individual officers may be engaging in racially biased practices, both in determining which drivers they will or will not stop and in determining what steps to take after the initial contact. This is a serious possibility that is not likely to be revealed with statistical analysis. To detect discriminatory practices at this level requires constant vigilance by the community, by all the officers within the department, and by the departmental administration. Statistical analysis, while valuable, cannot substitute for community involvement and effective management.

## Legal Issues Relating to Bias/Racial Profiling Data Collection and Analysis

### Overview

The findings and conclusions of any study involving bias/racial profiling are often used, or interpreted, in a number of ways, for a variety of purposes, by many factions. These studies often raise issues related to the management and administration of the agency, issues relating to the recruiting, training and attitude of the officers, and issues related to the community, just to name a few. This section focuses strictly on the legal issues involved with this, or any, study of bias/racial profiling.

Civil Liability

Without a doubt, the central legal issue relating to any study of bias/racial profiling by a law enforcement agency is the degree to which the agency, or the individual officers employed by the agency, may be subject to civil liability for their actions. While the terms "bias profiling" and "racial profiling" are of relatively recent origin, and neither are legal terms, the practice of bias/racial profiling, if substantiated, allows victims to pursue civil claims against an offending agency, or officer, under a variety of legal theories. Although each legal theory has its own strengths and weaknesses, for a number of reasons, the theory employed by most plaintiffs, and the one that is arguably the most difficult for plaintiffs to obtain evidence and prove, is that of a Constitutional violation of the 14th Amendment's Equal Protection Clause. Generally speaking, the standard required for a plaintiff to win in an Equal Protection claim is that the plaintiff must prove that other similarly situated individuals, of a different race, were treated differently. Likewise, proving, or disproving, disparity of treatment based on race should also be the focus of any study of bias/racial profiling. Thus, the key importance of any study on bias/racial profiling, from a legal perspective, is that the study's findings and conclusions can become the evidentiary basis for supporting, or defending, such claims. In short, the data, and more importantly the findings and conclusions of the evaluators, of bias/racial profiling studies serve as the statistical evidence used by plaintiffs or defendants to support or defend the legal claims.

Several courts have addressed the issue of civil liability under the 14th Amendment based on a claim of bias/racial profiling and the evidentiary requirements needed to support such a claim. These courts repeatedly emphasize the need for both plaintiffs and defendants to introduce valid and reliable statistical evidence establishing, or disproving, disparate treatment

based on race. Evidence taking the form of statistics based on anecdotal sources, or data evaluated using unacceptable methodology, are universally rejected by the courts.

In *Chavez v. Illinois State Police*, 251 F.3d 612 (7th Cir. 2001), a typical Equal Protection lawsuit, the court went to great lengths to outline the validity and reliability standards required of evidence relating to the collection and/or analysis of data regarding bias/racial profiling. The court noted that statistical evidence may be used to establish that other similarly situated individuals, of a different race, were treated differently; however, to be admissible and of any relevance to the issues before the court, such statistical evidence must be collected and analyzed in a universally scientifically acceptable manner. Further, the court noted that the statistical evidence must be subject to rigorous methodological procedures and evaluated by persons with the academic credentials and practical experience to qualify as experts. The court specifically noted the inherent problems with statistical evidence relating to bias/racial profiling with regard to the following: establishing base lines, determining the quantity and quality of the data being collected, sample groups, and interpretation. Accordingly, if the statistical analysis and findings and conclusions of this, or any, study of bias/racial profiling are to be of any value from a legal perspective, the study should comply with the evidentiary requirements currently being imposed by the courts.

This study seems to satisfy the admissibility requirements for evidence relating to disparate treatment based on race, currently being imposed by courts in bias/racial profiling cases. This study employed sound methodological techniques with regard to the collection and analysis of data and was performed by individuals with nationally recognized expertise in statistical analysis.

Disclosure of Information/Records

Although generally not rising to the level of concern as civil liability, law enforcement agencies engaged in the collection of information and analysis of data, whether related to bias profiling or some other topic, must be familiar with the applicable statutes and/or ordinances governing the release of public records. Typically referred to as "Open Records Acts", virtually all jurisdictions have enacted laws requiring certain records in the possession of police agencies to be released to the public. These "Open Records Acts" vary tremendously from jurisdiction to jurisdiction; however, in all jurisdictions, to some degree, the data collected as part of a bias-profiling project will be subject to disclosure to the public, and to the media. Ideally, agencies will address this legal issue before initiating any data collection to ensure they know, going into the project, what records, if any, will be subject to disclosure, and under what circumstances.

The fundamental questions to be resolved relating to the release of data and information collected as part of a bias profiling project are:

1) Who, exactly, is the custodian of the data and information relating to the project? [This can become very complex in situations where agencies contract all, or part, of the project out to a consultant.]
2) What records are, and are not, subject to disclosure?
3) Can any of the information collected be "masked" or otherwise shielded from disclosure? Must any information be shielded from disclosure?
4) If large data sets are subject to disclosure, what format is required?
5) Where disclosure of large, bulky, data sets is required, what costs, if any, may be recovered by the agency?
6) Is the analysis/interpretation of the data subject to disclosure also?
7) When must data/information be released? [This can pose difficulties in multi-year, on going, projects.]
8) How long must the data/information be retained and who had responsibility for archiving the materials?

Conclusion

It is imperative that agencies practice proactive risk management with regard to the collection and analysis of data relating to bias/racial profiling. In addition to serving as the basis for addressing a host of management, administration and personnel issues, bias/racial profiling studies can also serve as useful tools for developing statistical evidence for defending against lawsuits alleging civil rights violations. However, experts in statistical analysis must conduct any study using scientifically acceptable methodology. The statistical analyses involved in this study appear to satisfy the legal requirements currently being imposed by the courts and the findings and recommendations should serve as valid evidence relating to allegations of bias/racial profiling. Finally, a determination should be ascertained as to what degree the information/records will be subject to disclosure under the applicable Open Records laws.

## Conclusion and Recommendations

The Louisville Division of Police, as a whole, does not appear to be systematically stopping drivers based on their "racial or ethnic status or characteristics" as defined by departmental policy. While the percentages of races were not always equal in some categories, the discrepancies are most likely explained by factors other than the driver's race. For example, the age and sex of the driver were important explanatory factors in many events. This makes sense given that we know driving behavior to be different among various ages and between the sexes; younger drivers drive differently than older drivers and males drive differently than females.

This study used a comprehensive set of data collected about a population of stops over a 12-month period. The data were collected in a consistent manner, with only minor problems pertaining to entry and recording that were addressed as they were discovered. The statistical

analysis used to evaluate the data was rigorous, thorough, and conducted by academicians with expertise in the collection, analysis, and interpretation of such data. Further, this analysis was conducted on a contractual basis with researchers from the University of Louisville, providing a level of objectivity that is necessary to avoid any conflicts of interest or appearances of impropriety. These factors have yielded valid data, making valid conclusions highly likely. The only caveat is that one full year's worth of data should be collected and analyzed to provide a baseline from which to evaluate future stop practices.

Moreover, the legal considerations set forth by the courts have been met, making legal actions against the Louisville Division of Police based on accusations of "racial profiling" very unlikely. However, the Department must still recognize that this does not preclude the actions of any one officer becoming suspect. Our findings do not conclude that such profiling might not be occurring against individual citizens by one or more individual officers. This type of discrimination on an individual level, however, is virtually impossible to detect or to prove given the type and amount of discretion that officers must use in the completion of their duties. These matters are more likely to be discovered through administrative and supervisory vigilance, and through community awareness, rather than through the collection and analysis of traffic stop data.

The Louisville Division of Police can enhance their collection of traffic stop data. The recommendations offered here involve both process and content elements of the project. First, it is suggested that the 2001 traffic stop data be used as a baseline for analyzing future department practices and that the department continues to collect data on an annual basis. Second, census population data should not be used as a baseline given that it has very little, if anything, to do with the stoppable driving population in an area at any given time.

Third, data collected for the year 2001 should be viewed carefully as the department experienced considerable challenges in refining the data entry process. Throughout the course of this project quality assurance checks were employed to ensure that the data collected was valid although it is suggested that the validity of the data may continue to be somewhat suspect. Continued monitoring of date entry and fine-tuning of the department's quality assurance mechanisms, however, must be a priority. A fourth recommendation involves continued training of all officers in regard to departmental policy, data collection procedures, and the results of the analysis. Officers collecting the data must have a thorough understanding of the project in order to ensure more accurate and complete data collection and entry. In a similar vein, supervisors must be proactive in ensuring line officers understand the policies and procedures related to the project. Supervisors also should identify officers who require additional training or closer supervision to ensure adequate understanding of the data entry procedures as well as policy compliance.

These recommendations are offered to improve the data collection process and to enhance the quality of the data. Several of these recommendations were communicated to the Department as the study progressed and have been addressed. Others currently are being implemented. Overall, the departmental administration has been receptive to recommendations for the improvement of their data collection and analysis, and seems genuinely concerned about the accurate measurement of traffic stop practices. Although no evidence of departmental discriminatory stop practices may be welcome news, the department now is faced with the responsibility of continual monitoring to maintain these practices for the continued benefit of both the department and the community.

## Bibliography

Engle, R.S., Calnon, J.M., & Bernard, T.J. (2002). Theory and racial profiling: Shortcomings and future directions in research. Justice Quarterly, 19(2), 249-273.

MacDonald, H. (2000). The burden of bad ideas: How modern intellectuals misshape our society. Chicago: Ivan R. Dee.

Newport, F. (1999). Racial profiling is seen as widespread, particularly among young Black men. Gallup Poll, December 1999, #411, 18-23.

Ramirez, D., McDevitt, J. & Farrell, A. (2000). A resource guide on racial profiling data collection systems: Promising practices and lessons learned.

Simms, J. (2000). The Maryland I-95 corridor study. University of Washington in Missouri. (http://www.artsci.wustl.edu/~focus205/supreme/stats_i95.html).

Smith, M. & Petrocelli, P. (2001). Racial profiling? A multivariate analysis of police traffic stop data. Police Quarterly, 4, 4-27.

Withrow, B.L. (2002). Race based policing: An initial analysis of the Wichita Stop Study. Paper presented at the meeting of the Academy of Criminal Justice Sciences, Anaheim, CA.

Zingraff, M. Warren, P., Tomaskovic-Devey, D. Smith, W., McMurray, H., Mason, M & Fenlon, C. (2001). Evaluating North Carolina State Highway Patrol Data: Citations, warnings and searches in 1998. North Carolina Department of Crime Control and Public Safety. (On-line). Available: www.nccrimecontrol.org/shp/ncshreport.htm

## APPENDIX A

Louisville Division of Police Policy on Racial Profiling

## APPENDIX B

Louisville Division of Police Scantron Form