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Racial and Ethnic Disparity in Traffic Stops in North Carolina, 2000-2011: Examining the Evidence

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This report reviews existing studies of traffic stop data in the State, discusses best practices in traffic stop studies, and analyzes traffic stop data collected in North Carolina since 2000. It is an important contribution in the field of statistical analysis to identify potential police racial and ethnic bias in law enforcement in North Carolina and elsewhere. The North Carolina Association of Chiefs of Police and the North Carolina Sheriff's Association are commited to the accurate detection and elimination of bias, and commissioned this study to aid law enforcement, state and local policy makers, and citizens in this effort.

Racial bias in law enforcement, as in other human activities, cannot be completely eliminated. However, professional police management and practices are aimed at this goal. This report contains many guideposts for law enforcement in gathering and evaluating data. As this report also demonstrates, the perception of pervasive law enforcement racial bias in North Carolina is unjustified based on available data, is detrimental to public safety, and has been partially engendered by flawed analysis.

Concluding that racial bias is proven by mere racial disparities in rates of police actions (stops, searches, arrests) is generally recognized to be an unreliable indicator of bias. " [O]nly a handful of scholars continue to maintain that racial/ethnic disparities in traffic stop studies are evidence of racial discrimination" (p. 4 of report, citing a separate study). "[O]bserved racial disparities are not considered to provide evidence of racial bias by police. Nor is the absence of racial disparities considered to provide evidence there is no racial bias by police" (p. 16).

A recent study released by the N. C. Advocates for Justice organization, while widely disseminated and relied upon as proof of widespread law enforcement bias in North Carolina, is shown to be seriously flawed and at odds with accepted protocols in traffic stop analysis. These flaws include:

- Using census distributions as a benchmark to determine bias.
- Aggregating data over disparate law enforcement jurisdictions and agencies.
- Failure to address recognized variables such as high crime areas; focused deployments such as drug interdiction; "differential offending" (racially disparate rates of crime); discretionary vs. non-discretionary searches.
- Erroneous statistics on checkpoint stops; conflating county with State Highway Patrol District data; combining search data on drivers with passengers; attributing impossibly high numbers of stops (not reflected in court records) to low population counties such as Camden and Yancey.

Whether based on flawed information or not, the perception of bias in itself is a challenge for law enforcement to overcome. Otherwise, public safety policies and practices can be compromised by injecting considerations based on false premises or assumptions. This can lead to "underpolicing," "policing by race," as well as erosion of public support and cooperation. Racial minorities, who are far more likely to be the victims of crime, suffer the most from these effects.

The study also discusses serious questions concerning the quality of data collected in the current traffic stop report system and suggests steps to enhance the quality and usefulness of data collected.

We offer this study as a valuable resource for law enforcement, policy makers, and citizens in a collaborative effort to address actual or perceived racial or ethnic bias in law enforcement.

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Introduction

In 2014 – after more than a decade of collecting traffic stop data to detect 'racial profiling' in North Carolina –law enforcement executives, policymakers, and citizens remain concerned about racial or ethnic bias in police actions and public perceptions of this phenomenon. The purpose of this report is to examine how traffic stop data recorded by law enforcement officers can be analyzed and understood to identify problems and develop effective responses.

This report provides a summary of more than two decades of research on this important issue, describing challenges in analyzing data, best practices for identifying disparities in traffic stops and interpreting the findings. This report also provides descriptive information about trends in traffic stops in North Carolina since 2000, establishing the critical need to review and improve the quality of data collected as well as to develop a standardized and reliable method of analysis. Valid data and reliable tools for analyzing traffic stop data have the potential to expand the use of this information for police decision-making, inform policymaking, and enhance relationships between citizens and law enforcement agencies.

Background of Traffic Stop Studies and Racial Disparities

Over the last two decades, a great deal of research has been carried out in the United States to detect evidence of racial or ethnic bias in policing. Most of this research has focused on examining variations in the frequency or outcome of traffic stops between racial or ethnic groups. Numerous research studies have been conducted in the last two decades after evidence of bias was documented in searches and stops of minorities on highways – particularly the I-95 corridor from Florida to New York. As early as 1993, the practice of profiling drug couriers –

techniques promulgated among local and state law enforcement agencies by the Drug Enforcement Administration (DEA) – came under fire in New Jersey and captured national attention. The stop and search practices of state police and troopers in New Jersey, Maryland and Connecticut were tested in court.

Much of the early research on 'racial profiling' in traffic stops was commissioned by defendants in those states to empirically support their claims that police practices were racially biased. One of the earliest studies was undertaken in New Jersey, where researchers conducted roadway observations to systematically document the race of law-violating drivers on the Jersey turnpike. The researchers then calculated the rate of violators by racial group and compared this ratio with the racial proportion of drivers stopped by troopers. The findings showed there were racial disparities, and the research buoyed the claims of defendants that troopers were biased. According to the state, there were other relevant factors in addition to race that affected the likelihood of stops and searches. The court, however, rejected that claim, calling it an "after the fact" denial. The court pointed out that it was the responsibility of the state to identify and document factors that could either explain or justify the use of race in the stop and search decisions of troopers (Buerger & Farrell, 2002).

After the court decision in New Jersey, numerous state police agencies began recording data about traffic stops – either voluntarily, pursuant to consent decrees or legislative action. By 1999, nine of the nation's 49 state law enforcement agencies were recording race or ethnicity for all traffic stops. This number increased to 16 in 2001 and 22 in 2004 (Hickman, 2005).[1]

Many local law enforcement agencies also began to record stop data during this time frame; by 2000, more than 4,000 law enforcement agencies in the nation were recording

[1] States that did not require state law enforcement agencies to collect race or ethnicity for any traffic stops included Alaska, Arkansas, Colorado, Georgia, Idaho, Iowa, Kansas, Kentucky, Louisiana, Minnesota, New Hampshire, Nevada, New Mexico, New York, North Dakota, Oklahoma, South Dakota, Vermont, Wisconsin and Wyoming.

characteristics of traffic stops (Warren & Tomaskovic-Devey, 2009). As with state police agencies, some local law enforcement agencies recorded stop data voluntarily while others – such as the Los Angeles and Cincinnati police departments – were mandated to do so by consent decree. Legislatures in some states passed statutory requirements mandating data collection. These states included North Carolina, Texas, Missouri, Nebraska and Nevada.[2]

Rationale for Collecting Data

The specific variables recorded in traffic stops vary between states and localities; however, some elements are routinely documented. These include the initial purpose of the traffic stop – such as speeding or signal violation, the race or ethnicity of the driver – usually based on an officer's assessment, the outcome of the stop such as arrest, citation, or warning, whether a search was conducted and if contraband was seized.

While it may seem readily apparent, the initial purpose of collecting traffic stop data was not clearly articulated. Requiring law enforcement personnel to collect data was widely considered to either demonstrate that police actions were biased or to alter presumed bias in police behaviors by monitoring the stops.

Buerger and Farrell (2002) observed that legislation mandating data collection was adopted "in hopes of determining or disproving that racial profiling actually occurs" (p. 274). But these scholars pointed out that the type and level of evidence that would "be sufficient to establish racial profiling" was unknown and they cautioned that the "monolithic data collection approach" being employed might fail to answer important questions. Engel, Calnon, & Bernard (2002) also cautioned that traffic stop data should be collected and analyzed only to answer

[2] In 2001, the Race and Justice Institute at Northeastern University began tracking data collection requirements for law enforcement agencies across the nation with funding from the U.S. Department of Justice, Bureau of Justice Assistance. The site appears to have been inactive since 2008.

carefully articulated questions while Farrell and McDevitt (2010) stated that "data collection by itself is insufficient to address the problem" (p. 85), however, some early studies of bias in policing showed that the practice of collecting data did affect police behavior. Using data from North Carolina, Warren & Tomaskovic-Devey (2009) found that the frequency of consent searches of minority drivers decreased while the hit rate for contraband increased.

Preliminary analyses of traffic stop data demonstrated that the concern of scholars was legitimate. Specifically, findings of racial or ethnic disparities in stops and searches were determined inadequate evidence of police bias. Engel (2008) observed that "[only] a handful of scholars continue to maintain that racial/ethnic disparities found in traffic stop studies are evidence of racial discrimination," Engel concluded that "the majority of the social scientific community recognizes the inherent limitations of these types of analytical techniques" (p. 8) and further cautioned:

> "Unfortunately, official data and statistical techniques have limitations that must be explained to, and understood by, various stakeholders seeking to eliminate police racial bias" (p. 27).

Farrell and McDevitt (2010) concurred:

> "The mixed and often inconclusive findings of many racial profiling studies have frustrated both law enforcement officials as well as members of advocacy communit[ies] who had hoped that the collection of data would either prove or disprove the claims of racial profiling by police" (p. 83).

Fridell (2004) elaborated on this dilemma, explaining that there is no "perfect method" to measure and establish racial bias. Instead, Fridell pointed out that the key purpose of collecting and analyzing stop data is to provide an empirical foundation to share concerns and facilitate police-citizen dialogue – a sentiment echoed by Farrell, McDevitt, & Buerger (2002):

> "The most effective and productive use of racial profiling data is not its ability to determine if racial profiling exists but rather its ability to provide concrete

> information to ground police-community discussions about patterns of stops, searches, and arrests throughout local communities" (p. 365).

For many law enforcement agencies, collecting data also served an indirect goal. For some, the collection of data aided police in building stronger, trusting relationships with minority communities; the collection of traffic stop data sent a strong message about the agency's position on racial bias, and it also enabled administrators to identify any problems with officer misconduct, providing an opportunity to monitor problematic behavior of individuals and to implement training that might be needed.

Approaches to Calculating Disparities

As introduced in the preceding section, concerns about racial and ethnic bias in traffic stops often focus on identifying differences or disparities in the proportion of minorities represented in traffic stops, stop outcomes, searches, and search outcomes. These disparities have been calculated in different ways. Four outcome measures are most commonly used to document disparities. [3] These include disparities in traffic stops, disparities in searches, disparities in stop outcomes and disparities in search outcomes. The following section of this report describes each of these explanations of disparity and supporting evidence.

Evidence of Disparities in Stops

In recent decades, much has been learned about racial and other variations in traffic stops conducted by police. National surveys consistently show that traffic stops are the most common form of citizen contact with police and there is some evidence of racial disparities in stops.

- In 2011, 10.2% of all drivers in the U.S. reported being stopped by police at least one time within 12 months.[4] About 10% of white drivers reported a traffic stop, compared to 13% of Black/African-American drivers and 10% of Hispanic drivers.

- In 2008, 8.4% of white drivers, 8.8% of black drivers and 9.1% of Hispanic drivers reported a traffic stop as their most recent contact with police. According to Eith & Durose (2011), the differences were not statistically significant.

[3] Although these four outcome measures predominate, some studies have used other measures – including the duration of the stop, perceptions of legitimacy of the stop and conduct of the police, and incidents of use of force. While use of force is routinely documented, other measures are not. For example, Northeastern University recommends that police document the duration of the traffic stop but this appears to occur infrequently.

[4] In 2011, 2008, 2005, and 2002, the Bureau of Justice Statistics collected information on citizen contacts with police as a supplement to the National Crime Victimization Survey, a nationally representative sample.

Initial research into racial disparities in traffic stops from the 1990s examined disparities in the *number* of stops for each racial and/or ethnic group. Calculations of disparity for traffic stops were initially made by documenting the percent of traffic stops for each racial and/or ethnic group relative to a benchmark measure. The term "benchmark" refers to the denominator used to calculate disparity. For example, if 30% of drivers stopped are Hispanic, researchers must compare this proportion to some baseline or benchmark measure – such as the proportion of Hispanics on the roadway, licensed Hispanic drivers in the jurisdiction, the Hispanic population, or some other baseline measure.

Census Benchmarks

Early studies of racial bias focused on traffic stops on major highways and traffic corridors. It was quickly recognized that the racial and ethnic composition of drivers on roadways did not match the racial and ethnic composition of the state or county in which the stop occurred. While it is tempting to use residential census population to calculate racial or ethnic disparities in the number of stops, further analysis confirmed that the racial and ethnic composition of communities does not accurately reflect the racial and ethnic composition of drivers on roadways (Tilyer, Engel, & Wooldredge, 2008; Fallik & Novak, 2012). Many drivers stopped on roadways are not residents of the jurisdiction, but are from outside the jurisdiction.

Nationally, Gau (2012) found that about half of drivers (52%) stopped by police resided in the city in which they were stopped. As early as 2000, Smith, et al. (2004) documented that a substantial portion of vehicle stops on highways were of drivers who were not residents of the jurisdiction. Subsequent studies have shown that the proportion of local v. non-local drivers stopped by police varies widely from one jurisdiction to another.

- In Pennsylvania, 25% of drivers stopped by the state police were not residents of the state and 64% were not residents of the county in which they were stopped (Tillyer & Engel, 2013).

- In Louisville, 1/3 of drivers stopped were not residents of the city (Higgins, Vito, & Walsh, 2008) while in Cleveland, less than one-third of stopped drivers were residents of the police zone in which they were stopped (Engel, Tillyer, Klahm, & Frank, 2012).

- In St. Louis, half of 48,210 stopped drivers were not city residents (Rojek, Rosenfeld, & Decker, 2012).

- In five jurisdictions in Texas, 54% of drivers stopped were not residents of the jurisdiction (Liederbach, Trulson, Fritsch, Caeti, & Taylor, 2007).

- In a small suburban community in Missouri, 98% of drivers stopped did not live there (Withrow, 2010).

These studies and others provided evidence that "residential census populations [were] the *least* reliable of the benchmarks available" for detecting racial profiling by law enforcement (Tilyer, Engel, & Wooldredge, 2008).[5] Consequently, the U.S. Department of Justice has stated that "social scientists now disregard comparisons to the census for assessing racial bias" in traffic stops.[6] Gold (2003) stated that "no reputable researcher uses general population as a yardstick" as research on biased policing has consistently found such measures "valueless" (p. 396). And Fridell (2004) concluded that census benchmarking "is of no scientific value for purposes of trying to measure racial bias in policing and, in fact, has very often resulted in misleading and unsupported findings" (p. viii).

[5] One exception to this view about the erroneous use of census data is articulated by Gaines (2005), who suggests that census data are an appropriate benchmark if police deployment, enforcement and crime patterns are also included in the equation.

[6] http://www.nij.gov/nij/topics/law-enforcement/legitimacy/traffic-stops.htm

Roadway Observations

Because of the inherent weaknesses of census data as a benchmark to calculate racial and ethnic disparities in traffic stops, research in the 1990s began efforts to determine the racial or ethnic composition of drivers on roadways through systematic observation of drivers. The goal was to establish an accurate count of the race and ethnicity of drivers on the roadway who were *available* to be stopped by law enforcement. While this was a complex and time-consuming task on major highways, it was even more difficult at the local level. Many researchers have articulated the difficulty they encountered in determining the race or ethnicity of motorists through observations. In Miami, Alpert, Smith, & Dunham (2004) sought to include ethnicity in their study of traffic stops; however, well-trained observers were unable to reliability detect ethnicity and the research was limited only to black and non-black motorists. Alpert, Smith, & Dunham (2004) claimed that systematic observation and identification of Hispanics was untenable as a research strategy because the data were not reliable.

Internal Benchmarking

Unable to develop reliable methods of detecting police bias in stops, many researchers have developed an "internal benchmark" to monitor and detect bias. This approach makes comparisons between stops and searches of officers who work in similar areas and at similar times. This method has some difficulties because smaller agencies do not have the volume of stops and searches to make valid comparisons. Another type of benchmarking involves focusing analysis on detecting bias in searches. Using the racial/ethnic composition of drivers stopped provides a denominator from which a ratio of searches can be calculated.

Calculating Disparity in Search Rates

Calculating racial or ethnic disparities in searches appears more straightforward that calculating disparities in traffic stops – the number of searches of a racial or ethnic group is divided by the number of stops of the racial or ethnic group, and comparisons are made in the relative proportions between different groups. The assumption is that in the absence of bias, each racial and ethnic group would display a similar proportion of searches.

Overall, many studies show that racial disparities are more pronounced among drivers who were searched than among drivers who were stopped.

- Nationally about 5% of traffic stops in 2008 resulted in a search. Black drivers, however, were three times more likely to be searched than whites; 12.3% of black drivers were searched compared to 5.8% of Hispanic drivers, and 3.9% of white drivers (Eith & Durose, 2011).

- Fewer traffic stops in 2011 in the U.S. resulted in a search, but the racial disparities were greater; 3.5% of traffic stops resulted in the search of a driver, including 2.3% of white drivers compared to 6.3% of black drivers and 6.6% of Hispanic drivers (Langton & Durose, 2013).[7]

Studies show that being subject to a search has a major impact on views of the legitimacy of police actions. About 10% of drivers are stopped each year for a traffic stop. In 2011, 88% of drivers in traffic stops believed "police behaved properly and treated them with respect," this rating declined significantly for drivers who were searched. Among searched drivers, only 61% felt police behaved properly (Langton & Durose, 2013, p. 1).

There is some evidence that search rates vary widely between jurisdictions.

- On interstate highways in Kentucky, 2.2% of drivers were searched (Williams & Stahl, 2008)

[7] Tomaskovic-Devy, Wright, Czaja, & Miller (2006) found that drivers underreport their involvement in traffic stops. Only 72% of white drivers and 62% of black drivers who had actually been stopped for speeding in North Carolina reported having been stopped. In 2000, 18.1% of white drivers and 26.4% of black drivers in North Carolina reporting having been stopped that year,

- In an unnamed southwestern city, 6.7% of stops resulted in a search (Tillyer, 2012); Schafer, Carter, Katz-Bannister, & Wells (2006) found in an unnamed city that 7% of stops resulted in a search. In another unnamed southern city, 7.96% of stops resulted in a search (Tillyer & Klahm, 2011)

- In Missouri, 7.9% of traffic stops by police in 92 municipalities lead to a search (Rojek, Rosenfeld, & Decker, 2004) while in St. Louis, 10% of stops lead to a search (Rosenfeld, Rojek, & Decker, 2012)

- In Houston, 16.4% of stops resulted in a search (Roh & Robinson, 2009)

- In Riverside, CA, 17% of all stops resulted in a search (Gaines, 2006)

- In Louisville, 18.3% of stops resulted in a search (Higgins, Vito, & Walsh, 2008), and

- In Portland, 18.7% of stops resulted in a search (Renauer, 2012).

Part of the difference in search rates relates to organizational assignments. Dedicated traffic units in law enforcement agencies make many stops but rarely conduct searches. Of the stops made by the Traffic Unit in Riverside, CA, only 1.1% resulted in a search while 20% of the stops made by other units of the police department resulted in a search (Gaines, 2006).

An increasing amount of research has recognized that not all searches are created equal and focused on the *type* of search carried out by law enforcement. Common types of searches include consent searches, searches conducted after an arrest, or because of probable cause established by an officer. These differing types of searches have different implications for bias and must be analyzed separately.

Consent searches are the most common type of search. National survey data show that the majority of searches are carried out with the consent of the driver (Eith & Durose, 2011) – 58% of searches of drivers (and 60% of searches of vehicles) were conducted with the consent of the driver in the 2008 wave of the Police-Public Contact Survey (PPCS), a supplement to the National Crime Victimization Survey (NCVS). Since at least 2000, consent searches have been the focus of much of the research on disparities. It is believed that consent searches are the most

likely to reveal racial or ethnic bias because these searches involve more officer discretion.[8] In fact, research has increasingly distinguished between searches that are classified in one of two ways –

high-discretion searches and low discretion searches (Pickerill, Mosher, & Pratt, 2009).

Based on national survey data from 1999, Engel & Calnon (2004) observed a possible interaction between search and arrest. The authors found that blacks were more likely to be searched but they were also more likely to be arrested. Researchers did not have information about the type of search, and could not determine the temporal sequence of events; however, of the 6.6% of drivers who were searched, 52% were arrested. Rosenfeld, Rojek, & Decker (2012) elaborated on this point, recommending that searches conducted *prior* to an arrest are those that should be considered discretionary and have the potential to reflect bias while searches conducted *after or pursuant* to an arrest reflect a different set of circumstances. Consent searches precede an arrest, while searches relating to warrants or on-view arrests occur subsequent to arrest. Engel (2008), however, pointed out that officers actually have little discretion in another type of search – probable cause.

Law enforcement agencies vary in the extent to which searches are mandated. Engel (2008) described how 15% of searches by the Pennsylvania State Police were mandatory while 60% of those conducted by Arizona troopers were mandatory. These differences reflected variations in each agency's policies, interpretations of state laws and variations in police practices. It has, however, become standard practice for research to exclude analysis of searches conducted pursuant to warrants or arrests since these involve little officer discretion (Rosenfeld, Rojek, & Decker, 2012; Fallik & Novak, 2012).

[8] They also require agreement from the driver.

In contrast, consent searches do not require probable cause or other conditions; consent searches require merely that an officer asks an individual for permission to search their person, vehicle or belongings. Organizational policies on consent searches vary from one jurisdiction to another. In North Carolina, Smith et al. (2003) found that troopers were required to articulate reasonable suspicion before asking for consent and some troopers stated they routinely asked for consent even when there was probable cause.[9]

Other researchers believe that an officer's request for consent to search may not be viewed as a request that can be denied. Instead, a request for consent may be viewed as a directive from the officer and this contributes to perceptions of being mistreated by officers (Gau, 2012). There is some scant information about the extent to which consent requests are declined.

- In Florida, Close & Mason (2007) found that 93% of drivers asked for consent by troopers agreed, however, there was an overall very low search rate. Less than 1% of all stops in this study lead to a search – a trend associated with state law enforcement agencies.
- In Richmond, Smith & Petrocelli (2001) found that white drivers were more likely to consent to a search than were blacks. (And, as a result, more likely to be arrested.)
- Conversely, in Miami-Dade Alpert, Smith, & Dunham (2004) found that black, white and Hispanics consented to searches at the same rate.
- In Pennsylvania, two-thirds of consent requests from state police resulted in a search – however, agreement varied by race – 63% of white drivers consented, compared to 74% of black and 84% of Hispanic drivers (Engel, 2008).[10]
- Gau (2012) found that 17% of drivers who were searched were asked for consent.
- In Pennsylvania, Engel (2008) found that 2/3rds of consent requests made by the Pennsylvania State Police resulted in a search while an ACLU study found that 91% of drivers consented when asked for permission to search.

[9] Officers said this was done to alleviate concerns about fabricating evidence and, to be seen as "more respectful" thus avoiding antagonizing people. The researchers concluded that some searches recorded as consent searches likely met the standards for probable cause.

[10] Engel states that 49% of consent requests that were declined resulted in a search for another reason; this explanation seems highly inconsistent with the use of consent searches by law enforcement officers elsewhere.

Because of variations in search types, researchers recommend making a clear distinction between *types* of searches and stop outcomes. Rojek, Rosenfeld, & Decker (2012) exclude stops from analysis in which there was an outstanding warrant on the driver as search and arrest are mandatory on such stops in Missouri.

As early as 2000, Smith, et al. (2003) followed a similar practice: "We ignore searches incidental to an arrest because we assume that if there is sufficient cause to arrest someone, the search of the person is perfunctory from the point of view of whether or not there is disparity" (p. 158). Warren & Tomaskovic-Devey (2009) only examined consent and probable cause searches – excluding other types of searches. Limiting search types has a major impact on findings of disparity. In Vermont, searches that were non-discretionary were almost equally divided between white and non-white drivers (McDevitt & Posick, 2011).[11]

Calculating Disparity with Search Outcomes

The outcome of a search – that is, its success in terms of a seizure of contraband – is widely known as "hit rate." This is the proportion of all searches that result in a "hit" or finding of contraband. Lower hit rates for minorities are interpreted as showing racial bias, particularly when these low hit rates are associated with higher search rates. Known as the "outcome test," the presumption of this line of thinking is that lower "hit rates" are evidence of police bias in conducting searches. Numerous researchers have examined hit rates and compared search success rates between different racial and ethnic groups.

- In Rhode Island, Farrell & McDevitt (2006) found that minorities were four times more likely to be consent searched but less likely have contraband.

[11] While state laws in North Carolina require police to justify and document separate searches of individuals, their vehicles, property and passengers, research on disparities has focused on searches of drivers and vehicles.

- In Riverside, CA, 18.4% of whites were searched, as were 20.1% of blacks, and 22.0% of Hispanics. The overall hit rate was 10.47%, but it was higher for whites at 12.6% and lower for blacks at 9.2% and Hispanics at 9.6% for Hispanics.

- In North Carolina, Warren & Tomaskovic-Devey (2009) found that when the number of searches of black drivers by a state interdiction unit declined – as consent searches were used less frequently due to political pressure – hit rates increased. In other words, the proportion of searches resulting in contraband increased. As consent searches declined, the hit rates for black drivers searched and white drivers became similar. About 1/3 of searches resulted in contraband – 36% and 31%, respectively, for black and white drivers compared to 24% and 36%, respectively, when there were more consent searches.

- Similarly, in Charlotte, Smith, Davison, Zingraff, Rice, & Bissler (2004) observed that when the volume of consent searches increased, hit rates declined. The volume of searches increased substantially during nighttime hours but search success rate dropped; conversely, as fewer searches were conducted during daylight hours these searches were much more productive.

One issue in calculating hit rates relates to the type of search. An evaluation of "hit rates" as an indicator of success – or conversely as evidence of police bias – can best be examined with probable cause and consent searches. While it might be expected that hit rates are higher for probable cause searches than consent searches, some research suggests this is not the case. Tillyer & Klahm (2011) found that hit rates for discretionary searches were higher than hit rates for mandatory searches; and hit rates for discretionary searches of blacks were twice as high as those for whites. Hit rates may not be relevant in searches incident to arrest. A key purpose of searches incident to arrest is often to inventory the vehicle and personal effects associated with processing the arrest.

Calculating Disparity in Stop Sanctions

Every traffic stop has an outcome or disposition and it is the outcome of the stop that has been the frequent focus of research and analysis. Most research has focused on outcomes with formal actions – arrest or citation of the driver, or informal action – a written or oral warning or the stop may conclude with no action at all. While a formal stop outcome – one concluding with

a citation or arrest – is reported frequently as showing racial bias, research suggests that stops concluding with no action may also show evidence of police bias. For example, in Riverside, CA, Gaines (2006) found that more than half of all traffic stops by patrol officers did not result in a citation or arrest – drivers were released with no action, and Gaines interpreted this as validation that the stop was pretexual.[12] Gaines explained that the department encouraged such stops by patrol officers to reduce crime. It was not the purpose of these stops, according to Gaines, to enforce traffic laws but to control crime. Among the pretext stops in Riverside, 10.4% stops of African Americans resulted in an arrest, compared to 15.2% of Hispanic stops, and 8.5% of white stops. Other researchers such as Fridell (2005) agree that "no action" stops cause skepticism about the legitimacy of police actions.

Explanations of Disparities in Stops and Searches

More than two decades of research on traffic stops in the United States suggests that minorities are more likely to be stopped and significantly more likely to be searched, but these observed racial disparities are not considered to provide evidence of racial bias by police. Nor is the absence of racial disparities considered to provide evidence there is no racial bias by police. Instead, researchers have found that disparities may reflect a more complex interaction between police and citizens. Four major explanations have developed that explain racial and ethnic disparities. These include police bias, deployment practices, differential offending, and other explanatory factors. In this section, we discuss the evidence supporting each of these explanations.

[12] Half of white drivers were released (50.1%) as were 53.2% of black drivers and 45.7% of Hispanic drivers. Overall, white drivers comprised 37% of stops, black drivers were 14.9% and Hispanics were 43.3%.

Police Bias

While racial disparities in traffic stops and outcomes do *not* provide evidence of police bias such disparities *may* reflect police bias. Some in-depth research within specific jurisdictions has shed light on racial differences in traffic stops based on the demographic characteristics of officers such as their age, experience, gender, and race. In these studies, officer factors have been found to influence stops and outcomes.

- In Miami-Dade, female officers were more likely to stop black drivers (Alpert, Dunham, & Smith, 2007).
- In Savannah, older officers were more likely to make traffic stops and white officers were more likely to issue citations (Alpert, Dunham, Stroshine, Bennett, & MacDonald, 2004)
- Younger officers stopped a higher proportion of minority drivers in one jurisdiction, but the officers were typically assigned to high-crime areas which were predominately minority (Alpert, Dunham, Stroshine, Bennett, & MacDonald, 2004). This was also true in a study by Meehan & Ponder (2002). In Cleveland, less experienced officers were more likely to conduct searches (Tillyer, Klahm, & Engel, 2012).
- White officers were more likely to conduct searches in Florida (Close & Mason, 2007) and in Cleveland (Tillyer, Klahm, & Engel, 2012), but officer race did not affect search decisions in Washington state or Richmond, VA, (Pickerill, Mosher, & Pratt, 2009; Smith & Petrocelli, 2001).

An increasing amount of evidence suggests there is an interaction between the race of an officer making a stop and the race of the driver. In other words, stop outcomes vary when the race of officer and driver differ. In Boston, Antonovics & Knight (2009) found that a search was more likely when the race of an officer differed from that of the driver. Research in Cincinnati showed officer-driver communication was "more positive" when they were of the same race (Dixon, Schell, Giles, & Drogos, 2008). More recently, a national survey showed that drivers who were stopped by officers of a different race were less likely to feel the stop was legitimate (Langton & Durose, 2013).

Deployment Practices

The location in which traffic stops occur has an impact both on the prevalence of stops and the frequency of searches. Geographic location has been found to explain much of the observed racial and ethnic disparities in stops because more officers are assigned to high crime areas and these areas are often dominated by minority groups. Known as the "deployment hypothesis," this explanation suggests there are important variations in police stops, searches and seizures within sub-areas of jurisdictions and these patterns are reflected in racial and ethnic disparities of stops, searches and seizures. There is substantial evidence to support this hypothesis.

Throughout the United States, it is common practice for police to deploy officers based on workload and to use proactive approaches – primarily vehicle stops – to address crime and other public safety problems. Most law enforcement agencies use an algorithm to deploy patrol officers based on reported crime and citizen demands, as reflected in 911 calls to police – an effort to objectively distribute police resources within a jurisdiction.

While disparate stop rates of minorities may be associated with racial or ethnic bias of police, other explanations have emerged and the most prominent of these relate to comparing the racial or ethnic proportion of stops to the amount of crime, calls for service, number of officers deployed, race of crime suspects, and indicators of economic disadvantage within the jurisdiction.

- In Cincinnati, researchers found that blacks were 36% more likely to be stopped by police than whites, but disproportionate rates of stops by individual officers were largely explained by their assignment to areas of relative deprivation – areas characterized by high unemployment, residential instability, high rates of high school drop-outs, and lower income level (Bostaph, 2007).
- In Riverside, CA, Gaines (2006) found that the amount of crime, citizen calls to police and the race of crime suspects were closely correlated with the racial distribution of traffic stops within police districts.

- In Richmond, VA, Petrocelli, Piquero, & Smith (2003) found that the amount of crime in neighborhoods correlated with the number of traffic stops. In other words, as the number of crimes reported by citizens increased in neighborhoods, the number of traffic stops by police increased.
- In Houston, Roh & Robinson (2009) found a correlation between the deployment of officers to beats and the number of traffic stops.
- In Portland, Renauer (2012) found that citizen-initiated calls for service within neighborhoods explained racial variations in traffic stops.
- In Charlotte, researchers found that calls for service explained part of the differences in stop rates among blacks in police districts (Smith, Davison, Zingraff, Rice, & Bissler, 2004).
- An exception to the deployment hypothesis occurred in in Kansas City, where Novak and Chamlin (2012) examined crime and calls for service by police beats, but did not find a significant relationship with deployment and stops.

Just as deployment influences the volume and disparities in traffic stops, an increasing number of research studies have identified deployment as a factor contributing to searches.

- In Houston, Roh & Robinson (2009) found that variations in search rates reflected police deployment.
- In Kansas City, Novak & Chamlin (2012) found a relationship between search rates and police workload.
- In Portland, Renauer (2012) found that calls for service within neighborhoods influenced search rates.

Thus, research has found that evidence that disparities in traffic stops and searches are influenced by deployment and some research suggests that deployment also influences the outcome of stops.

- In a study in Seattle, Engel, Smith, & Cullen (2012) concluded that disparities in the racial and ethnic composition of drug arrests reflected variations in police deployment relating to crime patterns.

Closely related to the deployment hypothesis is the concept of the "out of place hypothesis" – police officers recognize and initiate traffic stops with drivers who appear out of place. For example, Bates (2010) found that drivers in Detroit who were "out of place" – that is, whites in black neighborhoods, or blacks in white neighborhoods – were more likely to be

stopped, ticketed, searched and arrested. Overall, research has fairly consistently found support for this explanation of disparities in stops (Novak & Chamlin, 2012; Meehan & Ponder, 2002; Renauer, 2012; Roh & Robinson, 2009; Gaines, 2006).

Differential Offending

Some research has found that driving and other behaviors vary between racial groups putting some persons at greater risk for police action – either of being stopped or the disposition of a stop. There is evidence for this view widely known as the "differential offending" hypothesis. Studies have found that:

- Black drivers were over-represented among drivers speeding "excessively" – that is exceeding the posted speeds by 15 mph or more (Smith, et al., 2004; Tillyer and Engel, 2013; Lange, Blackman, & Voas, 2005; Lundman & Kowalski, 2009).

- The number and severity of offenses affects the outcome of stops (Smith et al., 2003; Fallik & Novak, 2012; Pickerill, Mosher, & Pratt, 2009) with alcohol and drug involvement increasing the likelihood of a search and arrest (Bates, 2010; Alpert, Dunham, Stroshine, Bennett, & MacDonald, 2004; Miller, 2009; Schafer & Mastrofski, 2005).

- Romano, Voas, & Lacey (2010) found that Hispanics were consistently over-represented in impaired driving events. Mansfield and Imai (2006) found that Hispanic drivers in eastern North Carolina faced significantly higher mortality rates in vehicular crashes.

- While blacks, males and younger drivers were more likely to be subject to a discretionary search in a study by Tillyer (2012), drivers with a criminal history faced the greatest likelihood of being searched. Those drivers were nearly five times more likely to be searched than those without a criminal history, and this factor mediated the likelihood of blacks being searched.

Other Explanatory Factors

Despite evidence of racial disparities in traffic stops, research has increasingly identified a number of other factors – in addition to race – that weigh in and explain disparities. Research

weighing the relative contribution of factors in addition to race provides a more comprehensive view of the complex interactions between citizens, officers and the setting in which stops occur. These factors vary from one study to another but reflect five major categories:

- **Driver characteristics.** In addition to race and ethnicity, these variables include age, gender, driving or other behavior, demeanor, prior criminal record, and residency status (local resident v. non-local).
- **Vehicle features.** These include vehicle age, vehicle condition, and number of passengers.
- **Location and situational context.** These variables document the environmental conditions of the stop including the time of day, geographic location, crime rate, call volume, road safety problems such as crashes, economic conditions, roadway type, and ethnic and racial composition of areas within a jurisdiction such as a district or sector.
- **Officer characteristics.** These variables include officer's age, race or ethnicity, gender, years of experience, and assignment, such as to a traffic unit or interdiction team.
- **Characteristics of the law enforcement agency.** Factors examined include the type of agency and its operational practices including deployment practices, use of traffic or other specialized units, emphasis on traffic safety and officer discretion in conducting searches.

The combination of driver race with gender and age, affects both the likelihood and outcome of traffic stops (Fallik & Novak, 2012; Engel & Calnon, 2004; Rosenfeld, Rojek, & Decker, 2012; Eith & Durose, 2011). Age of drivers is a key factor in disparity because younger drivers are consistently more likely engage in "risky driving behavior," affecting both their likelihood of being stopped but also searched by police (Lange, Blackman, & Voas, 2005; Lundman & Kowalski, 2009; Smith, et al., 2004; Engel & Calnon, 2004; Close & Mason, 2007). Driver demeanor also influences the outcome of a traffic stop with nervousness or inconsistencies in explanation, as well as non-compliance or resistance increasing the likelihood of a search (Smith, et al., 2004; Engel, Tillyer, Klahm, & Frank, 2012; Engel & Johnson, 2006; Engel, 2008).

The presence of passengers in vehicles has been found to affect both the likelihood of a stop and its outcome. In Cleveland, 45% of stopped vehicles had passengers and this was a significant predictor of a search (Tillyer, Klahm, & Engel, 2012). Vehicle characteristics appear to interact with race. Older vehicles and those in poor condition increase the likelihood of a stop, citation and search (Miller, 2009; Bates, 2010). In Cincinnati, analysis of police videotapes of black drivers stopped by police showed they typically had both more passengers and were driving older vehicles (Dixon, Schell, Giles, & Drogos, 2008).

Vehicle age, for example, is associated with drivers of lower income levels and may be more prevalent among minority drivers. This may give rise to traffic stops for equipment or regulatory violations. A study by Miller (2009) in North Carolina found that age of a vehicle was an important predictor of a traffic stop. In Detroit, drivers with older vehicle were more often ticketed (Bates, 2010) while in Cincinnati, analysis of videotapes of black drivers stopped by police showed they typically were driving older vehicles (Dixon, Schell, Giles, & Drogos, 2008).

Time of day is a factor in stops and searches. Drivers stopped at night-time face a greater likelihood of citation, search and arrest (Eith & Durose, 2011; Smith, et al., 2004; Pickerill, Mosher, & Pratt, 2009; Worden, McLean, & Wheeler, 2012; Fallik & Novak, 2012; Renauer, 2012; Dixon, Schell, Giles, & Drogos, 2008). Many studies have found that there was no evidence of racial bias in traffic stops when time of day was incorporated into analyses. No disparities in the race of stopped drivers were found in an analysis of stops by the Pennsylvania State Police and Massachusetts State Police when time of day was considered (Lundman & Kowalski, 2009). Other research examined these differences in stops by municipal police.

- Researchers in Oakland, CA, found no difference between the proportions of minorities stopped in the daytime v. those stopped at night, and concluded that there was no evidence of bias in stops (Grogger & Ridgeway, 2006).
- In Cincinnati, Ridgeway (2009) found blacks were less likely to be stopped during the daytime – a finding opposite from what would occur if officer perceptions of race influenced their stop decisions.
- In Syracuse, NY, researchers examined four years of data and found that stops of black drivers were no more common during the daylight than at night during darkness, and concluded there was no racial or ethnic bias in stops (Worden, McLean, & Wheeler, 2012).
- In Minneapolis, Ritter & Bael (2009) found that Hispanics and blacks were more likely to be stopped during daylight hours and this proportion dropped after darkness.

These studies and others increasingly suggest that traffic stops are not influenced solely by race but reflect a complex interaction of a wider range of variables. In large part, these studies suggest that much of the racial disparity observed in traffic stops and outcomes reflects overly simplistic models of police behavior. Thus, while race is widely found to be a factor in traffic stops, it is not the only factor and may not be the most important factor. In this way, empirical research increasingly suggests that observed disparities in stops and stop outcomes is not evidence of police bias.

Consequences of Perceptions of Bias

While scholars debate the influence of race in traffic stops, many police agencies have moved beyond that issue to face a disturbing reality – the perception that racial bias by police is widespread and prevalent. Police leaders have recognized that perceptions of police bias may be more important than empirical evidence. Perceptions of police as racially biased are pervasive. In 2004, more than half of Americans reported that racial profiling was widespread when motorists were stopped on roads (Carlson, 2004). These views were more common among minorities; 67% of blacks and 63% of Hispanics reported racial profiling by police as a widespread phenomenon. In contrast, 50% of white respondents shared that view. A more recent

survey by Gallup showed that 24% of young black men reported being treated unfairly by police within the last 30 days during a contact such as a traffic stop (Newport, 2013). In contrast, black females and black males who were 35 or older were less likely to report such treatment.

Police have been concerned about perceptions of fairness. Most law enforcement agencies place on premium on public confidence and seek to enhance their legitimacy with their minority communities. Thus, perceptions of racial bias and unfair treatment by police– even absent evidence – have important consequences for police leaders. Negative views of police undermine perceptions of police legitimacy. This causes minorities to be less compliant with police (Gau, 2012; Gau & Brunson, 2012) – a phenomenon observed in Cleveland (Engel, Tillyer, Klahm, & Frank, 2012) and elsewhere. Perceptions of unfair police practices also contribute to minorities being less likely to call police and report crimes (Gibson, Walker, Jennings, & Miller, 2009; Truman, 2011; Rennison, 2010) and less likely to cooperate with police (Farrell, McDevitt, & Buerger, 2002). This reluctance negatively affects crime investigations (Taylor, Holleran, & Tapalli, 2009).

Negative views of police by minorities are troublesome because it is minorities who often seek "increased police presence and protection from crime," according to Farrell & McDevitt (2010, p. 77) – behavior consistent with higher rates of victimization among minorities (Harrell, 2007; Truman, 2011; Rennison, 2010). The desire of minorities for additional police protection from crime is difficult when there are concerns about police mistreatment of minority citizens.

Concerns about "over-policing" and "under-policing" create a dilemma for both citizens and police. In many high crime areas, citizens want more police officers and quicker response times (Brunson & Gau, 2011) but the consequences of policing hot spots are perceptions of aggressive policing or over-policing (Lynch, Omori, Rousselll, & Valasik, 2013); research has

consistently shown the frequency of traffic stops is higher in urban areas (Cochran & Warren, 2011). Despite the fact that proactive policing has a negative effect on perceptions of police legitimacy, scholars and police have largely concluded that deploying fewer police to high crime areas would be unconscionable, as it would result in "de-policing" or under-policing areas in greatest need of services (Engel, Smith, & Cullen, 2012; Venkatesh, 2012). This phenomenon occurred in New Jersey; when police reduced the number of traffic stops because of concerns about racial profiling, Heaton (2010) found strong evidence that arrests for motor vehicle theft declined and the number of offenses increased.

Organizational Responses to Bias and Public Perceptions

To address concerns about racial disparities and perceptions of bias, numerous law enforcement organizations have implemented organizational reforms. Systems for collecting data about traffic stops were put into place in many states and local jurisdictions around 2000. Other approaches have been implemented to monitor, identify, prevent and respond to any evidence of racial bias by personnel. In addition to recording traffic and pedestrian stops, some of the organizational approaches used by law enforcement agencies include:

- Expanding camera systems
- Diversifying and screening personnel and increasing training
- Partnering with community groups
- Increasing professionalism
- Identifying problem employees
- Increasing efficiency
- Focusing on problems

Expanding camera systems. A major shift has occurred in the prevalence of in-car cameras – considered by many to be an effective deterrent to officer misbehavior. As early as

2001, a congressional committee advocated the use of in-car video cameras to monitor and reduce racial and ethnic bias in traffic stops. Congressman Dan Burton remarked:

> "The use of audio-visual technology should be a strong deterrent to racial profiling. If a police officer's actions are being recorded, he or she will be much less likely to stop someone unless there's an objective reason for doing it. If a police officer does target motorists for no other reason than their race, there will be videotaped evidence to discipline him. On the other hand, if a police officer is falsely accused of violating someone's rights, there will be evidence to exonerate him" (U.S. House of Representatives, Committee on Government Reform, 2001, pp. 4-5).

Testimony at the congressional hearing included varied interest groups, including a representative from the ACLU, who supported making in-car video more common, to law enforcement, including a New Jersey state trooper who was accused of racial profiling but exonerated by the video in his patrol vehicle. In response to widespread allegations of profiling and misconduct, the New Jersey Highway Patrol installed cameras in all their patrol vehicles in 1998 but still came under a consent decree with the U.S. Department of Justice which required, among other things, that troopers document numerous characteristics of traffic stops, including race, ethnicity, gender and police actions. Troopers were required to limit consent search requests to stops with reasonable suspicion and secure written consent from the driver.

At the time of the congressional hearing, camera technology was predominately analog – making the retention and storage of tapes a major issue for law enforcement agencies, however, digital cameras were becoming more common (U.S. House of Representatives, Committee on Government Reform, 2001) . However, there was rapid adoption of in-car camera technology by police agencies. In 1997, 46% of large law enforcement agencies – those with 100 or more sworn employees – used in-car cameras. By 2000, one-third of all local police departments had in-car video cameras; the overall prevalence of cameras increased to 55% in 2003 and 61% in 2007 (Reaves, 2010).

Diversifying sworn personnel and increasing training. Most law enforcement agencies have made efforts to diversify their sworn personnel to be more reflective of the population they serve. By 2007, about 10% of all police officers in the United States were Hispanic and a total of 25% of officers were minorities, compared to 17% in 1987. According to Reaves (2010), about one-third of large police agencies screen new officers for their understanding of culturally-diverse populations and nearly two-thirds of large police departments have incentive pay for bilingual officers. An element of this diversification has been expansion of in-service training programs for officers relating to minorities; in North Carolina, Juvenile Minority Sensitivity Training is a required annual in-service training topic.

Partnering with community groups. Partnering with community groups has remained a central focus of professional law enforcement agencies. By 2007, about half of all police departments in the nation employed dedicated community policing officers – a decline from earlier years – however, policing practices designed to increase partnerships with community groups have become commonplace. More than 80% of police departments serving populations of 50,000 or more report partnering with citizens' groups to get community input and many agencies conduct citizen police academies or sponsor citizen surveys to gather community input on crime and safety.[13]

Increasing professionalism. Many law enforcement agencies seek accreditation through the Commission on Accreditation for Law Enforcement Agencies (CALEA) – a national organization with requirements for both monitoring and analyzing racial and ethnic composition among officers. In North Carolina, more than 31 municipal police agencies, six sheriff's offices,

[13] Overall, 15% of police departments conduct citizen police academics and sponsor surveys. These functions are more common in large police agencies; more than 90% of large police departments conduct citizen academies and 65% of agencies serving populations of 250,000 to 1 million conduct citizen surveys.

five campus police departments, and several state agencies, including Alcohol Law Enforcement, DMV License and Theft Division, and the N.C. State Highway Patrol are accredited, and must meet the continuing accreditation standards. As part of accreditation, agencies must meet standards on biased policing – including establishing clear policies, providing explicit training to personnel and monitoring police productivity measures such as stops and citations for any evidence of bias.

Identifying problem employees. Many law enforcement agencies have refined and formalized their complaint systems in recent years, making it easier for citizens to file complaints on officers for mistreatment, and making the outcomes of subsequent internal affairs investigations more transparent. Such complaint systems include Early Warning Systems and Early Intervention Systems (EIS). Such systems not only monitor complaints and other factors, but monitor officers for disparities in stops or actions that may be indicative of a problem officer. Technology such as in-car cameras supports such monitoring and other types of technology are increasingly being used to monitor officer behavior. These include other types of video and audio-recording devices, such as body cameras, and automatic vehicle locator (AVL) systems. Some agencies – particularly large police departments – developed formal complaint policies and practices relating to use of force and other issues. While 8% of all police agencies had a citizen review board in 2007, more than three-fourths (77%) of large police agencies – those serving a population of 1,000,000 or more – had one. In fact, for 31% of the nation's largest police agencies, the citizen review board was an independent agency with full investigative authority and subpoena powers. Overall, nearly one-third of all police agencies used an external review process for complaints on officers.

Increasing efficiency. Other advancements in technology have expanded resources accessible to patrol officers. In North Carolina, an on-line warrant system (N.C. AWARE) makes it easier for officers to check the status of individuals rather than relying on subjective cues of suspiciousness. Police also increasingly use in-car computers to access vehicle records, driving records, and outstanding warrants. In 2007, about half of all police agencies in the nation reported using field computers for these purposes in 2007 and one-third could access criminal records from the field (Reaves, 2010).

Focusing on problems. In the last decade, technology has made enormous contributions to policing in terms of guiding equitable deployment of patrol officers and other departmental resources. Contemporary views of policing almost ubiquitously recommend place-based policing; police are encouraged to focus on problem "places" – small areas within a jurisdiction that generate a disproportionate volume of calls, crime or crashes. Such areas and tactics are variously known as place-based policing, intelligence-led policing, evidence-based policing or hot spots policing. The increased availability of Geographic Information Systems (GIS) in policing – including access to real-time crime maps in patrol cars – has further facilitated the deployment of officers to problem locations. By 2007, virtually all police departments serving populations of 250,000 or more used crime mapping; overall, 75% of police departments reported mapping crime compared to 57% in 2003 (Reaves, 2010).

Federal and state funding also support such efforts. Two prominent examples are Smart Policing Initiative (SPI) and Data-Driven Analysis and Community Traffic Safety (DDACTS). SPI is funded by the U.S. Department of Justice, Bureau of Justice Assistance while DDACTS is supported by the National Highway Traffic Safety Administration (NHTSA). At the state level, specialized traffic units in North Carolina are funded by the Governor's Highway Safety, and

other specialized units – including interdiction and street-level impact teams – supplement patrol activities in high crime areas. Without exception, such funding supports the deployment of police to areas with high crime, crashes, and calls for service, and guides police officers to engage in proactive strategies including traffic stops in such areas. As a result, place-based policing has become one of the most common policing strategies and "hot spots policing" has been evaluated as one of the most effective policing practices.[14]

[14] https://www.crimesolutions.gov/Programs.aspx#practices

An Examination of Traffic Stops in North Carolina

Despite a range of efforts to detect and prevent bias in policing, many jurisdictions across the nation continue to collect and examine data from traffic stops to monitor racial disparities. Traffic Stop Reports (TSR) data has been collected in North Carolina since 2000. In this section of this report, we analyze more than 13,000,000 traffic stops recorded from January 2000 through June 2011.[15] State law initially required only state law enforcement agencies in North Carolina to collect data. In the first two years of data collection – 2000 and 2001 – traffic stops were documented by law enforcement agencies such as campus police of the UNC system, the N.C. State Highway Patrol, Alcohol Law Enforcement (ALE), Broughton Hospital and the NC Arboretum. A total of 30 state law enforcement agencies reported data on 635,193 stops in 2000 with the N.C. State Highway Patrol documenting 89% of all stops that year.

Most local law enforcement agencies – municipal police and county sheriff's departments – began reporting traffic stops in 2002. State law required that all sheriffs' offices report their stops and any municipal agency with a service population of 10,000 or more, or with five or more full-time officers per 1,000 population report traffic stops.

The total number of traffic stops in 2002, with both local and state law enforcement agencies reporting, was 1,314,200. This was more than double the number of stops reported in 2000. Even with the addition of local law enforcement agencies reporting stops in 2002, the Highway Patrol continued to report the lion's share of the stops with 478,966 or 36.4% of all stops. Several large police departments are prominent in the distribution of stops. The Charlotte-Mecklenburg Police Department reported almost 100,000 stops or 7.2% of the total in 2002, and the Raleigh Police Department reported 51,675 – or 3.9% of the total stops in the state.

[15] These dates were selected to replicate data used in another study described later in this report. The replication permits a comparison of findings between the two studies.

In contrast, many local agencies reported very few traffic stops in 2002. The sheriffs' departments in Allegheny, Sampson, Anson, Mitchell, Bertie, Scotland, Ashe and Hyde all reported fewer than 100 stops in 2002.

Over time, the annual number of stops has been somewhat volatile but has overall increased since 2000 (see Table 1 and Figure 1). The trend in the agencies reporting the most stops and the least has been steady during this time frame. Over 11 ½ years, the Highway Patrol recorded 47% of more than 13,000,000 traffic stops in the state, Charlotte-Mecklenburg Police reported 7.7% and Raleigh Police Department reported 4.1%. In contrast, about 73 law enforcement agencies have reported an average of 100 stops or fewer per year. (See Table 21 for a list of all agencies reporting data since 2000 and the total number of stops reported by each.)

Nearly 300 law enforcement agencies currently report Traffic Stop Reports (TSR) data. As shown in Figure 2, almost 60% of the agencies reporting TSR data are municipal police departments, but the stops made by these agencies comprise only 43% of all stops. Sheriff's departments make about 7% of traffic stops but represent one-third of all agencies reporting.

In general, the number of traffic stops by agency is fairly consistent with the size of the agency's service population and number of sworn officers but other factors also affect the volume of traffic stops by an agency. These include the deployment of a Traffic Enforcement Unit, grants from the Governor's Highway Safety Program (GHSP) or other highway safety funding. Such campaigns promote an increased volume of traffic stops focused on particular road safety issues, such as "Click It or Ticket" and "Booze It and Lose It." For example, GHSP's "Booze it and Lose It" campaign in December 2013-January 2014 resulted in 3,164 arrests for DWI.[16]

[16] http://www.ncdot.gov/m/news/releases.html?news=ghsp

Table 1: North Carolina, Traffic Stops by Year, 2000-2011

Year	Traffic Stops
2000	635,193
2001	588,960
2002	1,314,200
2003	1,089,837
2004	1,010,310
2005	961,000
2006	949,628
2007	1,434,957
2008	1,370,692
2009	1,436,483
2010	1,683,520
2011(through 6/15)	758,855
Total	13,223,635

Figure 1: Annual Traffic Stops in North Carolina, 2000-2010

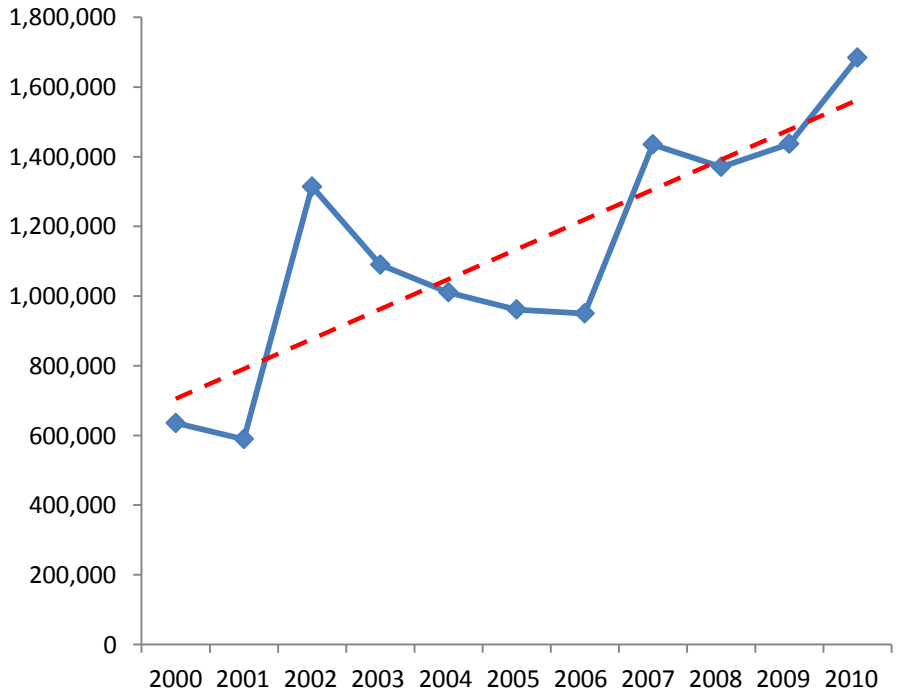
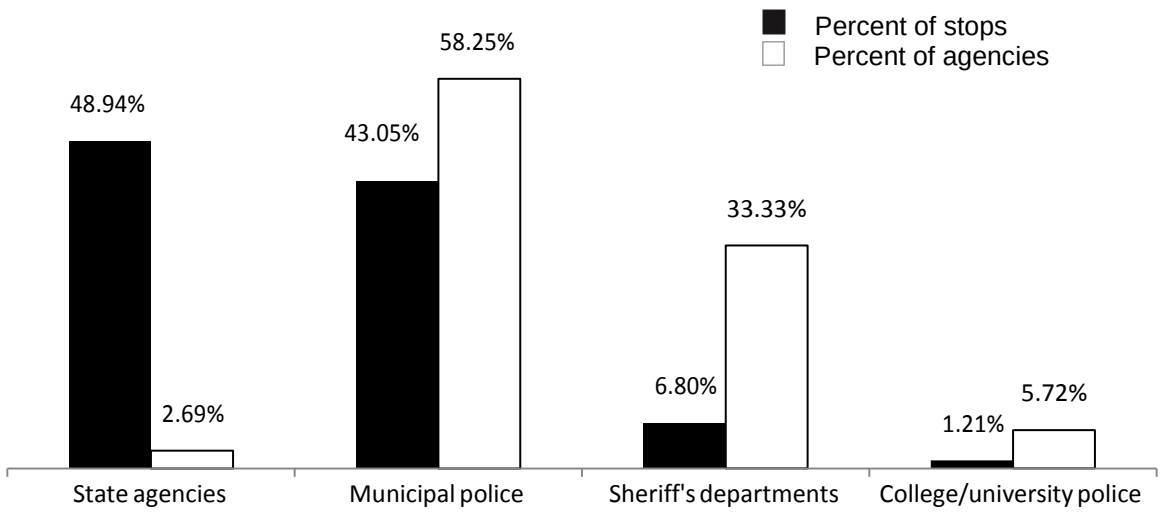


Figure 2: Percent of Traffic Stops by Type of Agency, 2000-2011
(N=13,233,635)



Data Documented in Traffic Stops

The data elements which law enforcement officers in North Carolina must record in traffic stops are specified in General Statutes. The statute requires that data be recorded only for proactive stops; the information is not required for motor vehicle crashes. The required elements recorded in North Carolina's TSR include two major categories – information about the stop and, if applicable, any searches arising from the stop. The data elements of a stop without a search include the following:

1. **Stop identifying information**. Agencies must report the name of the law enforcement agency making the stop, the city and/or county in which the stop occurred, the date and time, and a unique identification number for the officer.
2. **Descriptive information about the driver**. For all vehicle stops, officers must record the driver's race, ethnicity, age and gender.
3. **Stop characteristics**. Officers must document the initial purpose of the stop – documenting one of 10 reasons.[17] The officer must also identify one of five actions

[17] The ten types of stops include speed limit violation, stop light/sign violation, Driving While Impaired, safe movement violation, vehicle equipment violation, vehicle regulatory violation, seat belt violation, other motor vehicle violation, investigation and checkpoints. Checkpoints were added to the types of stops documented in 2010 but the law does not require data to be recorded for all vehicles stopped at checkpoints; documentation is required only for checkpoint stops resulting in an enforcement action,

taken at the conclusion of the stop – arrest, verbal or written warning, citation issued or no action taken. If an arrest was made, the officer must identify whether the driver or passenger was arrested. Additional information documented includes whether physical resistance was encountered, whether the officer used force, and if the driver, passenger, or officer was injured.

If an officer conducts a search pursuant to a stop, additional information must be recorded. These additional elements include:

1. **Type of search.** Officers must indicate one type of search – consent, search warrant, probable cause, incident to arrest, or protective frisk.
2. **Basis of the search**. Officers must record the basis of the search but are not limited to one basis. Instead, the officer may indicate up to six search bases including erratic or suspicious behavior, observation of suspected contraband, suspicious movement, informant's tip, other officer's information, or witness observation.
3. **Subject of the search.** Officers identify if a search was conducted of the vehicle, driver, passenger, and/or personal effects of the driver or passenger.
4. **Demographic characteristics of passengers.** Officers must record the age, race, ethnicity and gender of up to four passengers, however, this information is required only if one or more passengers was searched during the stop
5. **Contraband**. Officers must record if contraband was found and the type and amount of contraband for drugs, alcohol, currency, weapons or other.
6. **Property seized.** Officers record whether currency, personal property or other property was seized as a result of the stop.

The TSR data are available on-line through the N.C. Department of Justice.[18] The website includes an analysis tool to enable citizens – and law enforcement agencies – to query many of the reporting elements for each reporting agency in a summary format. Eight different types of reports are available. (A sample of one type of report is displayed in Table 2.) In addition to the table report tool, raw data are available upon request.

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seizure of contraband or search. Similarly, there are limitations on documentation of investigative stops. Officers are instructed not to document traffic stops related to criminal investigations such as arising from a warrant, notice of a stolen vehicle, look-outs (BOLO) or similar criminal investigations.

[18] http://trafficstops.ncdoj.gov/Default.aspx?pageid=2

Law enforcement agencies report TSR data to the N.C. Department of Justice, Division of Criminal Statistics, though a secure login website, and are required to do so within defined time periods.[19] According to the General Statutes, agencies that do not submit the required data are ineligible to receive grants from or through the state of North Carolina. Each law enforcement agency submits its own data to the website. The Division of Criminal Statistics provides a repository for agencies to submit their data; the division's task is only to "collect, correlate, and maintain" stop information.

Table 2: Sample Traffic Stop Report

Asheville Police Department

Initial Purpose of Traffic Stop by Enforcement Action Taken

Saturday, February 15, 2014

Report From 1/1/2012 through 12/31/2012

Purpose	Verbal Warning	Written Warning	Citation Issued	On View Arrest	No Action Taken	Total
Checkpoint	0	0	21	3	0	24
Driving While Impaired	2	0	1	45	6	54
Investigation	264	3	273	98	310	948
Other Motor Vehicle Violation	207	9	226	33	113	588
Safe Movement Violation	945	76	440	63	33	1557
Seat Belt Violation	72	7	149	6	3	237
Speed Limit Violation	404	84	1912	17	1	2418
Stop Light/Sign Violation	395	32	396	12	3	838
Vehicle Equipment Violation	958	37	173	38	36	1242
Vehicle Regulatory Violation	986	38	1246	76	186	2532
Total	**4233**	**286**	**4837**	**391**	**691**	**10438**

[19] § 114-10.01 requires agencies to submit traffic stop information within 60 days, however, the SBI advises agencies to enter data on the reporting website within 10 days of the stop or by the 10th of each month for batch entry, noting that data are accessible to the public within 30 days after the end of the month.

Demographic Composition of Stops

Drivers in TSR data are classified based on ethnicity – Hispanic or non-Hispanic – and race. During the 11 ½ year period, Hispanic drivers comprised 7.9% of the 13,233,635 stops in North Carolina and the remaining 92.1% were of non-Hispanic drivers.

TSR data classifies race into five categories – black, white, Native American, Asian and other. Initial analysis showed that 63.8% of drivers were white, 29.4% were black, 1.1% were Asian, 0.7% were Native American and 5.1% were considered "Other" (see Table 3). According to the SBI (2009), a person's race should be characterized as "Other" when it is unknown. A large number of drivers – 669,259 – were classified this way. A cross-tabulation of race and ethnicity showed that the race of nearly half of the Hispanic drivers was documented as "Other" and some were possibly classified incorrectly. Hispanics may be of any race. However, according to the guidance provided by the SBI (2009) to North Carolina officers, the "standard classification" of Hispanics is either white or black.

Because the racial classifications of drivers documented in TSR were inconsistent, drivers were regrouped into three distinct categories – non-Hispanic white, non-Hispanic black, and Hispanic of any race. This reclassification eliminated 393,935 non-Hispanic drivers classified as Asian, Native American and Other – 3.0% of all drivers in the initial dataset. The decision seemed appropriate given the lack of consistency in racial and ethnic classification of drivers in traffic stops. This approach was also consistent with racial and ethnic categories used in other studies of police bias. The Bureau of Justice Statistics (BJS), for example, has classified drivers as non-Hispanic White, non-Hispanic Black/African American, and Hispanic in four waves of the Police-Public Contact Survey. Using the three racial/ethnic groups permits comparisons with findings from that survey and other data sources. Subsequent analysis in this

report is thus limited to these three demographic groups – non-Hispanic white, non-Hispanic black, and Hispanic of any race.

The reclassification resulted in a final dataset of 12,839,682 stops – including all drivers identified as Hispanic regardless of race (1,040,846), all non-Hispanic drivers identified as white (7,925,105), and all non-Hispanic drivers identified as black (3,873,731). The percentage of stops was comprised of 61.7% non-Hispanic whites, 30.2% non-Hispanic blacks, and 9.1% Hispanics of any race (see Table 4). These numbers contrast with the representation of these groups in the population of North Carolina based on the 2010 census – 67% non-Hispanic white, 24% non-Hispanic black and 9% Hispanic, respectively.

A simple comparison of the racial/ethnic composition of North Carolina's population and drivers stopped in traffic stops shows an apparent disparity. This disparity appears most distinctly in stops of black drivers. As seen in Figure 3, blacks comprised 23.9% of the state's population in 2010 but reflected 30.2% of all traffic stops from 2000-2011. White drivers appear to be under-represented in traffic stops. These apparent disparities were further examined by comparing the proportions of vehicle crashes by race/ethnicity with traffic stops.

The disparities in traffic stops show less disparity when compared with traffic crashes, fatal crashes, and alcohol crashes in the state. For example, traffic stops of black drivers are more consistent with black involvement in crashes. Crash involvement does not explain all of the disparity but sheds light on how demographic variables interact with police actions.

For example, further demographic information was available about stopped drivers based on gender. In contrast to national studies, male drivers in North Carolina were much more likely to be the subject of a traffic stop than were females (see Table 5). From 2000-2011, about two-

thirds of stopped drivers in North Carolina were male; at the national level, males comprised a similar distribution with 58.8% of traffic stops.

The disparity of males in traffic stops in North Carolina relates, at least in part, to their greater involvement in serious motor vehicle crashes. As seen in Figure 4, males were significantly more involved in fatal collisions in the state, comprising 65.7% of all fatal crashes. In contrast, females were well-represented in all crashes, comprising 46% of those reported from 2000 to 2011. But females represented only 34% of fatalities in crashes.

Table 3: Initial Race and Ethnicity of Drivers in Traffic Stops

	Hispanic	Not Hispanic	Total
White	513,223	7,925,105	8,438,328
Black	13,648	3,873,731	3,887,379
Other (Unknown)	508,229	161,030	669,259
Asian	3,663	136,336	139,999
Native American	2,083	96,569	98,652
Total	1,040,846	12,192,771	13,233,617[20]

Table 4: Reclassification of Race and Ethnicity into Three Groups

	Non-Hispanic white	Non-Hispanic black	Hispanic any race	Total
N.C. Population, 2010	66.8%	23.9%	9.3%	100%
N.C. traffic stops	7,925,105	3,873,731	1,040,846	12,839,682
% stopped in N.C.	61.7%	30.2%	8.1%	100%
% stops in U.S.	73.6%	13.4%	13.0%	100%
% all N.C. crashes	65.7%	27.0%	7.3%	100%
% N.C. fatal crashes	66.9%	24.1%	9.0%	100%
% N.C. alcohol crashes	63.1%	24.9%	12.0%	100%

[20] Ethnicity was missing for 18 individuals.

Figure 3: Racial/Ethnic Composition of Population and Traffic Stops

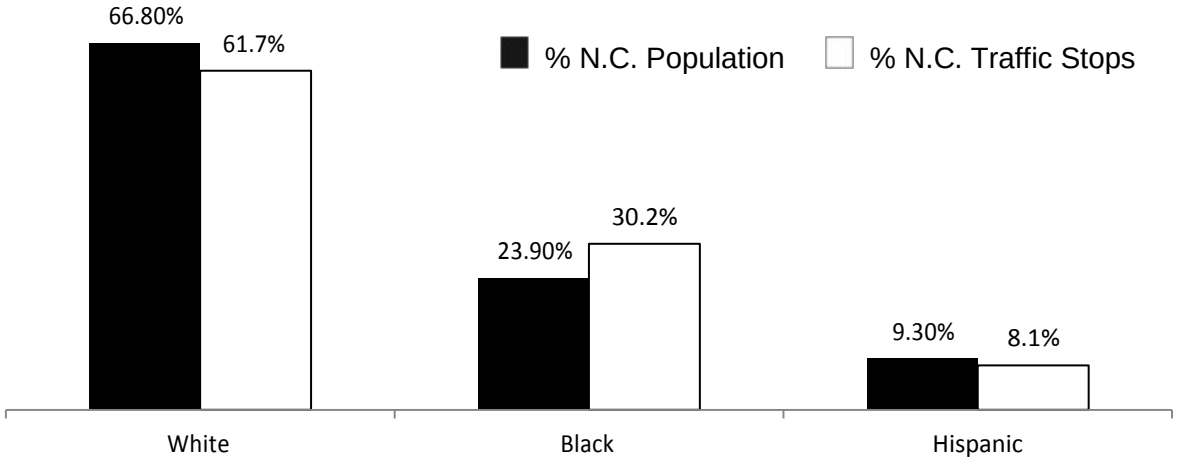
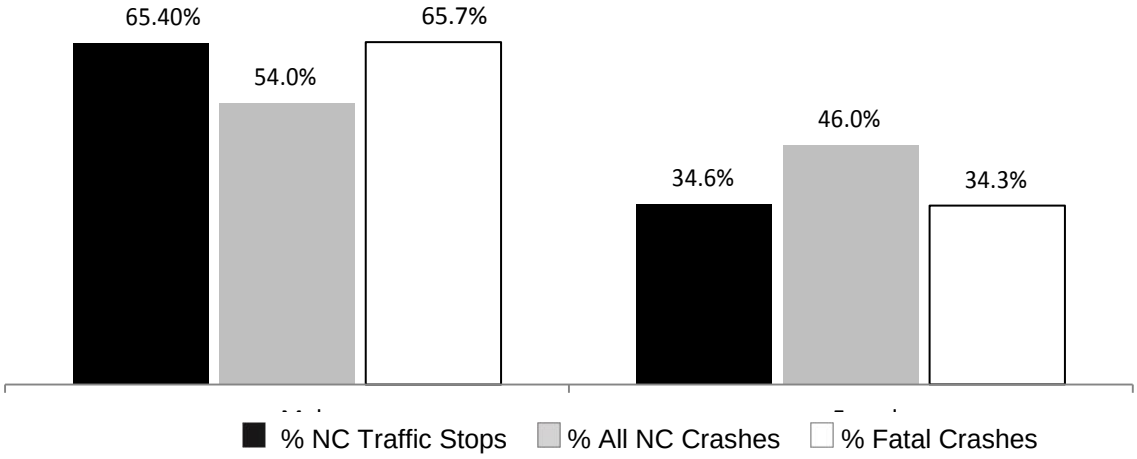


Table 5: Gender of Drivers in Traffic Stops

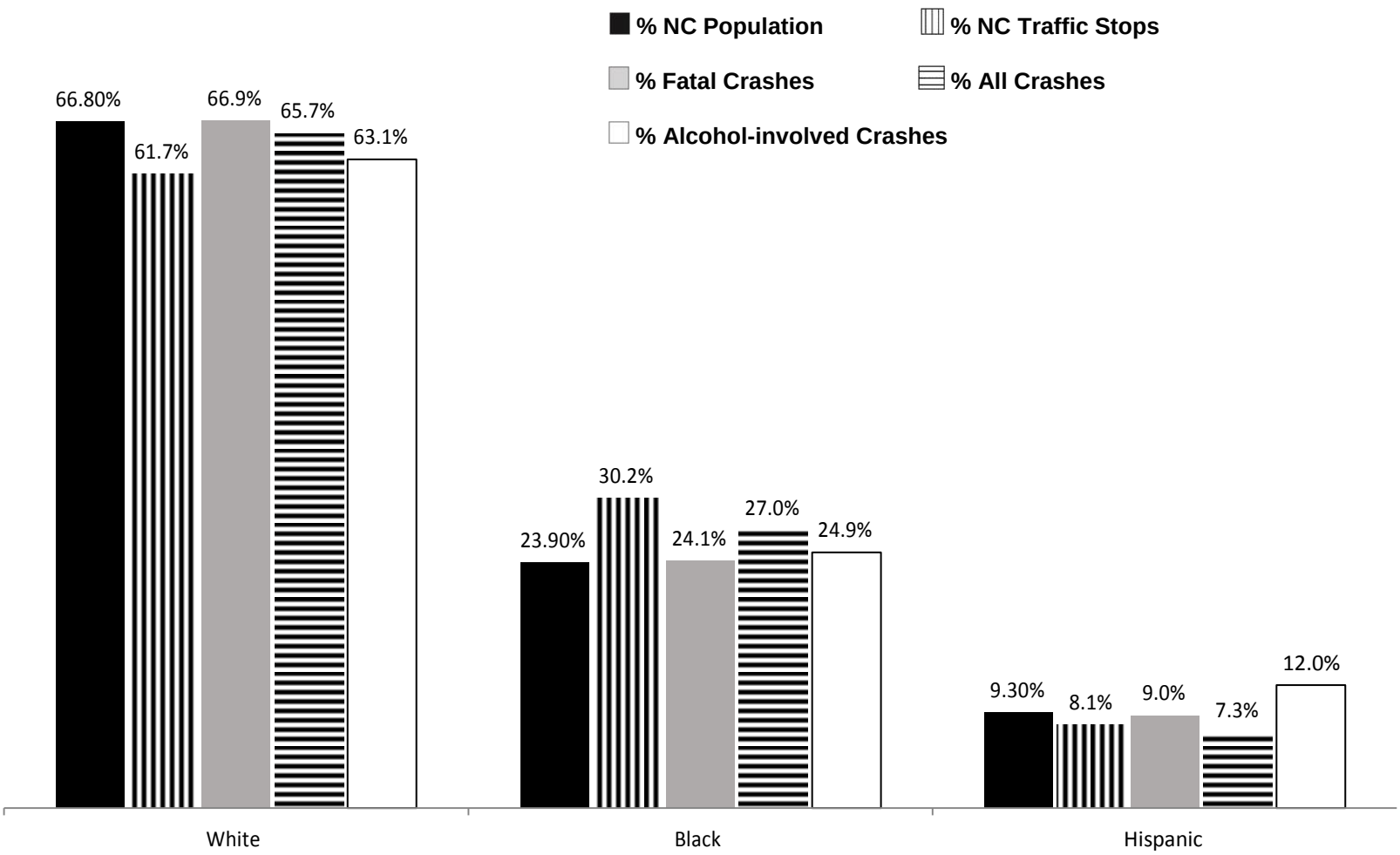
	White	Black	Hispanic	N.C.	U.S.[21]
Male	5,115,203 64.5%	2,420,945 62.5%	848,784 81.5%	8,384,932 65.3%	58.8%
Female	2,809,902 35.5%	3,873,731 37.5%	192,062 18.5%	4,454,750 34.7%	41.2%
	61.7%	30.2%	8.1%	12,839,682	100%

Figure 4: Traffic Stops and Crashes by Gender



[21] Langton and Durose (2013)

Figure 5: Percentage of N.C. Traffic Stops and Crashes by Race/Ethnicity, 2000-2011



Disparities in Types of Traffic Stops

Consistent with national findings, drivers are stopped for speeding in North Carolina more often than for any other purpose. During 11½ years, 44% of all traffic stops in North Carolina were for speeding compared to 46.5% of all traffic stops in the U.S. in 2011 and 48.8% in 2008 (Eith & Durose, 2011; Langton & Durose, 2013).

Regulatory violations were the second most common reason for traffic stops in North Carolina, with 14.4% of all stops, compared to 14.1% of stops at the national level in 2011 (Langton & Durose, 2013). As shown in Table 6, seat belt violations ranked third in prevalence for North Carolina traffic stops, accounting for 10.2% of all stops, and followed, in order of prevalence, by equipment violations, investigations, other, safe movement, signal violations and driving impaired. (Law enforcement agencies were also required to record data on checkpoints beginning in 2010, but this applied only to checkpoint stops that resulted in an arrest, search or seizure of contraband.)

The racial and ethnic composition of traffic stops varied between different types of stops (see Table 7 and Figure 6).[22]

- Non-Hispanic whites were stopped more frequently for speeding and seat belt violations – 67.3% and 68.6, respectively, than for other types of stops. This proportion was fairly consistent with their 66.8% of the state's population in 2010.
- Black drivers were over-represented among stops for regulatory and equipment violations. Black drivers comprised 37% and 38% of these traffic stops, respectively, although they represented 23.9% of the state's population in 2010.
- Hispanic drivers were over-represented among DUI stops and checkpoints, comprising 19.2% and 25.74% of the drivers in these stops compared to 9.3% of the state's population in 2010.

[22] Note that studies consistently report that population is not an appropriate basis to determine disparity. We display these findings only for purposes of a general comparison.

In some ways, the racial disparity within different types of stops in North Carolina is consistent with disparities found in other jurisdictions – and reflects real-world conditions. For example, some researchers have related the variations in stop type by racial groups to economic characteristics. Lower-income persons are more likely to drive older vehicles with regulatory or equipment violations. The racial disparity in regulatory and equipment violations for black drivers evidenced in North Carolina may reflect this phenomenon. Similarly, the apparent over-representation of Hispanics in DUI stops in North Carolina is consistent with the over-representation of Hispanics in alcohol-involved crashes, as displayed in Figure 5.

Table 6: Traffic Stops in North Carolina by Initial Purpose of Stop

Initial Stop Purpose	Traffic Stops 1/2000 – 6/2011
Speed limit	5,755,999 43.5%
Vehicle Regulatory	1,910,051 14.4%
Seat belt	1,347,489 10.2%
Vehicle Equipment	1,147,499 8.7%
Investigation	830,161 6.3%
Other	758,833 5.7%
Safe movement	679,442 5.1%
Signal violation	600,152 4.5%
Driving impaired	149,425 1.1%
Checkpoint	454,584 0.4%
Total stops	13,233,635

Disparities in Searches

Researchers often examine the ratio of searches to stops among racial and ethnic groups to detect racial and ethnic disparities in police practices. Overall, the search rate in North Carolina is lower than the national average. Nationally, 5% of traffic stops in 2008 resulted in a search (Eith & Durose, 2011); this rate dropped to 3.5% in 2011 (Langton & Durose, 2013). In North Carolina, the rate of searches arising from all traffic stops from 2000 to 2011 was 3.4%. Overall, however, the proportion of stops with searches declined in the 11 years. In 2002, 4.89% of stops resulted in searches; by 2011, this proportion had dropped to 2.3% (see Figure 7).

The trend in the proportion of traffic stops with searches is particularly noteworthy for consent searches. In 2002, 2.1% of traffic stops resulted in a consent search; this proportion dropped to 1.1% by 2011 (see Figure 8) and the proportion of searches for probable cause increased slightly.

Analysis showed that there are racial and ethnic disparities in searches but these vary between different types of traffic stops (see Table 8), by the type of search (see Table 9) and by a combination of search type and purpose of the stop (see Table 10). These descriptive analyses provide a summary of the distribution of stops and searches of drivers by stop type and racial or ethnic group.[23]

[23] The analysis is this report examines only characteristics of drivers who are stopped and searched. While TSR data include some information about passengers who were searched, there is no documentation of the number or presence of passengers who were not searched.

Table 7: Traffic Stop by Initial Purpose and Racial/Ethnic Group

	Non-Hispanic White	Non-Hispanic Black	Hispanic any race	Total Stops
Population, 2000	5,647,155 72.7%	1,737,545 22.4%	378,963 4.9%	6,199,872
Population, 2010	5,728,839 66.8%	2,048,628 23.9%	800,120 9.3%	7,763,663
Speed limit	3,746,563 67.3%	1,478,220 26.5%	343,421 6.2%	5,568,204 43.4%
Signal violation	347,570 60.1%	178,929 30.9%	51,899 9.0%	578,398 4.5%
Driving impaired	84,890 58.5%	32,416 22.3%	27,904 19.2%	145,210 1.1%
Safe movement	388,442 59.2%	194,881 29.7%	73,187 11.1%	656,510 5.1%
Vehicle Equipment	596,324 53.3%	415,209 37.2%	107,538 9.6%	1,119,071 8.7%
Vehicle Regulatory	1,021,621 54.7%	712,383 38.1%	135,366 7.2%	1,869,370 14.5%
Seat belt	898,007 68.6%	338,127 25.8%	72,469 5.5%	1,308,603 10.2%
Investigation	423,722 52.6%	262,952 32.6%	118,950 14.8%	805,624 6.3%
Other Checkpoint[24]	393,511 53.5% 24,455 46.6%	246,100 33.4% 14,514 27.7%	96,603 13.1% 13,509 25.7%	736,214 5.7% 52,478 0.4%
Total stops	**7,925,105** **61.7%**	**3,873,731** **30.2%**	**1,040,846** **8.1%**	**12,839,682**

[24] The reader should recall that officers are required to document drivers at checkpoints only if an action, such as an arrest or citation, occurs. The observed disparities at checkpoints thus cannot be compared with other types of stops.

Figure 6: N.C. Traffic Stops by Type of Stop and Driver's Race or Ethnicity, 2000-2011

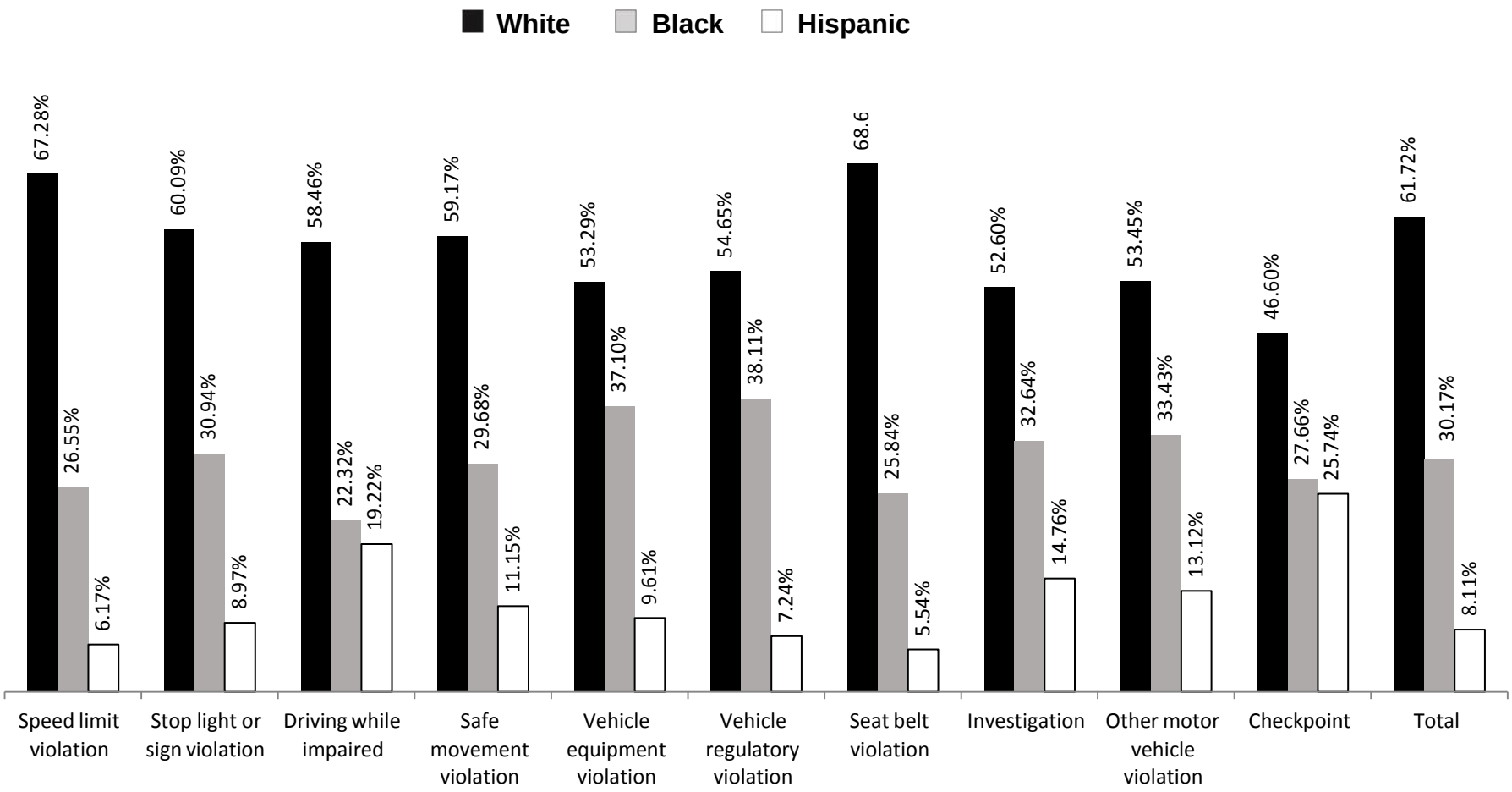


Figure 7: Percent of Stops with Searches, 2000-2011

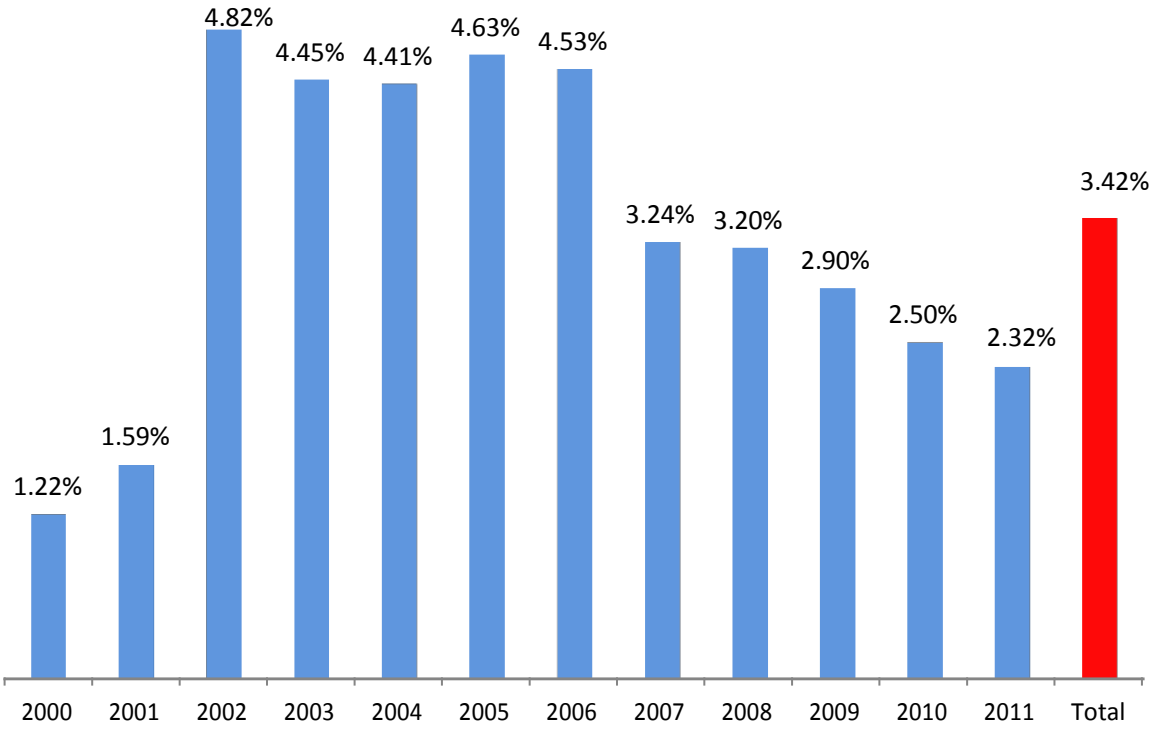


Figure 8: Probable Cause and Consent Searches as Percentage of Stops, 2002-2011

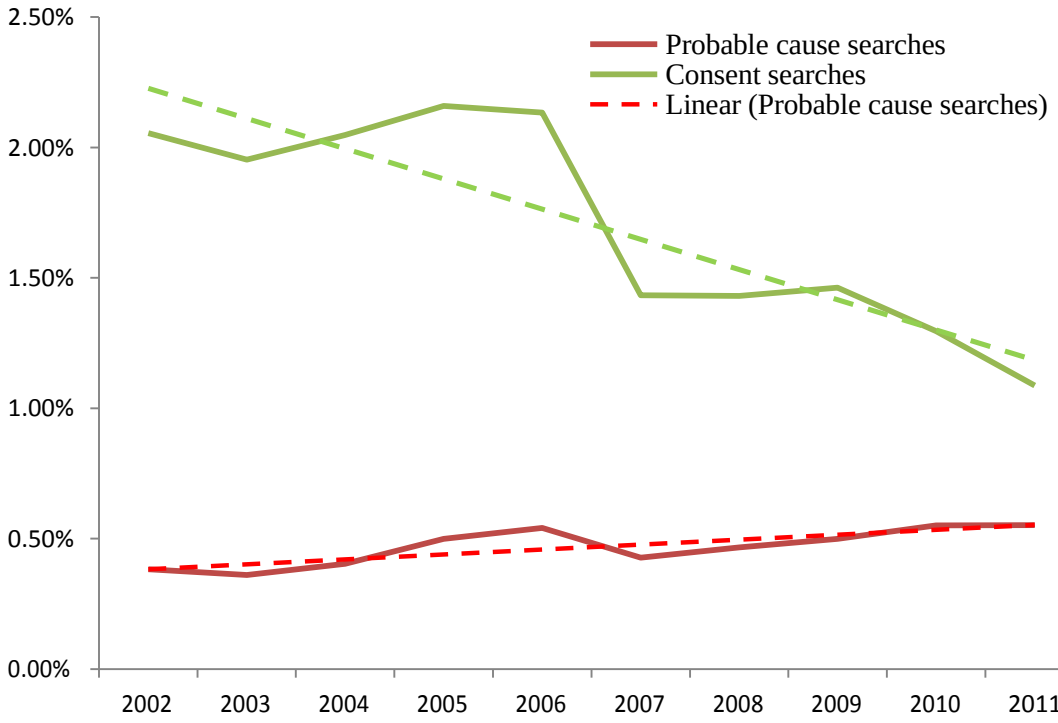


Table 8: Percent of Drivers Searched by Stop Purpose and Racial/Ethnic Group

	Total Searches	White %	Hispanic %	Black %	Total %
Speed limit violation	67,598	0.87%	2.72%	1.75%	1.21%
Stop light or sign violation	18,801	2.28%	4.32%	4.82%	3.25%
Driving while impaired	51,927	36.32%	40.11%	30.55%	35.76%
Safe movement violation	43,769	5.19%	10.97%	7.99%	6.67%
Vehicle equipment violation	63,387	4.27%	6.44%	7.47%	5.66%
Vehicle regulatory violation	73,763	2.48%	4.90%	5.87%	3.95%
Seat belt violation	22,918	1.04%	2.29%	3.52%	1.75%
Investigation	66,295	7.02%	5.47%	11.43%	8.23%
Other violation	34,937	3.34%	5.07%	6.86%	4.75%
Checkpoint	1,574	3.25%	1.31%	4.15%	3.00%
Total	444,969	2.46%	5.53%	4.96%	3.47%

Table 9: Search Type as Percent of Stops by Racial/Ethnic Group

	Non-Hispanic White	**Non-Hispanic Black**	**Hispanic, any race**	**Total**
Consent searches	88,151	88,223	23,174	199,548
% of stops	1.11%	2.28%	2.23%	1.55%
Search warrant	612	487	178	1,277
% of stops	0.01%	0.01%	0.02%	0.01%
Probable cause searches	21,593	30,731	4,038	56,362
% of stops	0.27%	0.79%	0.39%	0.44%
Incident to arrest	78,026	66,642	27,970	172,638
% of stops	0.98%	1.72%	2.69%	1.34%
Protective frisk searches	6,782	6,131	2,231	15,144
% of stops	0.09%	0.16%	0.21%	0.12%
No search	7,729,941	3,681,517	983,255	12,394,713
% of stops	97.54%	95.04%	94.47%	96.53%
All Traffic Stops	**7,925,105**	**3,873,731**	**1,040,846**	**12,839,682**

Table 10: Percent of Consent Searches by Stop Purpose and Racial/Ethnic Group

	Consent Searches	White %	Hispanic %	Black %	Consent Total %	All Searches Total %
Speed limit violation	27,166	0.35%	1.12%	0.68%	0.49%	1.21%
Stop light or sign violation	8,938	1.16%	1.62%	2.28%	1.55%	3.25%
Driving while impaired	4,222	3.11%	2.25%	2.96%	2.91%	35.76%
Safe movement violation	23,108	2.75%	6.24%	4.04%	3.52%	6.67%
Vehicle equipment violation	37,650	2.75%	3.76%	4.14%	3.36%	5.66%
Vehicle regulatory violation	39,721	1.45%	2.41%	3.05%	2.12%	3.95%
Seat belt violation	11,791	0.58%	1.11%	1.72%	0.90%	1.75%
Investigation	30,947	3.51%	2.36%	5.04%	3.84%	8.23%
Other violation	15,634	1.56%	2.39%	2.92%	2.12%	4.75%
Checkpoint	371	0.83%	0.36%	0.82%	0.71%	3.00%
Total	199,548	1.11%	2.23%	2.28%	1.55%	3.47%

Disparities in Detection of Contraband

Research on racial and ethnic bias has shown that disparities may be identified through variations in search rates compared to rates of seizing contraband between racial and ethnic groups. To make this calculation, a "hit rate" is computed by comparing the number of searches to the number of searches that yield contraband overall and for each racial or ethnic group. Previous research has found hit rates range from 10% to 30% of searches (Engel, 2008) although some jurisdictions have a very high hit rate.[25]

Our analysis of hit rates follows recommended practices:

- Of the total 13,233,635 drivers stopped, there were 452,741 searches.
- One or more types of contraband were found in 87,064 of the 452,741 searches
- There was an overall "hit rate" of 24.2%.[26]

As shown in Table 14, hit rates were also calculated for each racial and ethnic group. Across these three groups, searches yielded an overall hit rate of 19.25%; the hit rates of whites and blacks were almost identical, with 20.5% and 20.2% of searches, respectively, resulting in contraband. In contrast, only 11.7% of consent searches of Hispanics resulted in contraband.

A hit rate was also calculated for consent searches. This is an important distinction as not all searches are carried out to discover contraband. Discovering contraband, however, is really the sole purpose of consent searches. As shown in Table 14, the hit rate from consent searches was 16.5% compared with a hit rate of 21.5% for other search types.

As seen in Figure 9, consent searches of whites were almost as productive as non-consent searches; 19% of consent searches of white drivers yielded contraband. This compared to a

[25] In Vermont, McDevitt & Posick (2011) found that the state police had a hit rate of 73%.

[26] Note that this analysis examines all 13,233,635 drivers in the original dataset. The subsequent analysis of 'hit rates' in Table 14 only examines the 12,839, 682 drivers classified as black, white or Hispanic.

lower hit rate for non-Hispanic blacks and Hispanics – 15.6% of consent searches of blacks and 9.5% of consent searches of Hispanics yielded contraband. These findings suggest that consent searches of minorities were less productive than consent searches of whites – a possible indication of bias in the types of searches conducted, however, the decline of consent searches in recent years may have affected this disparity.

Disparities in Stop Dispositions

Traffic stops result in varied dispositions – warnings, citations, arrests or no action at all. The most common outcome for a traffic stop is a citation or ticket. A citation was the disposition in 69% of traffic stops in North Carolina from 2000-2011, including 90% of seat belt violations and 80% of speed violations (see Table 13). Among traffic stops in North Carolina, 306,971 or 2.3% of traffic stops resulted in the arrest of the driver. This arrest rate was consistent with national data; in 2008, 2.6% of all drivers in traffic stops in the U.S. in 2008 were arrested (Eith & Durose, 2011) however, 1% of drivers were arrested in traffic stops in 2011 (Langton & Durose, 2013).

Of traffic stops in the North Carolina from 2000 to 2011, about 13% resulted in a verbal warning and another 14% in a written warning. This too was consistent with national data – 27% of all drivers in traffic stops in the U.S. in 2008 received either a verbal or written (Eith & Durose, 2011).

A small proportion of stops resulted in no action (2.3%). Stops that resulted in no action are an issue of concern in examining police bias. Such stops have been criticized as clear evidence of police bias. To observers, a stop in which no formal action is taken is an indicator of a pre-textual and likely biased stop. Such stops appear to reflect an officer's interest in a vehicle or driver without the intent to act on the violation observed. As displayed in Table 11, traffic

stops concluding without any action were uncommon – occurring in about the same proportion as stops with arrest. Stops with no action were slightly more common among black drivers, with 2.8% concluding this way, compared to 2.1% for white drivers and 2.2% for Hispanic drivers (see Table 11).

Table 11: Action Taken After Traffic Stops

	North Carolina 2000-11	**National data**	
		Eith & DuRose (2011)	Langton & Durose (2013)
Verbal warning	1,716,760 13.0%	9.7%	
Written warning	1,802,033 13.6%	17.0%	
Total warnings	3,518,793 26.6%	26.7%	34%
Citation issued	9,102,820 68.8%	55.4%	53%
On-view arrest	306,971 2.3%	2.6%	1%
No action	305,051 2.3%	15.3%	14%
Total stops	13,223,635		

Table 12: Action Taken Following Traffic Stop by Driver's Race/Ethnicity

	White	**Black**	**Hispanic**	**Total**
Verbal warning	918,923 11.6%	626,853 16.2%	121,698 11.7%	1,667,474 13.0%
Written warning	1,196,496 15.1%	468,146 12.1%	90,307 8.7%	1,754,949 13.7%
Citation	5,502,162 69.4%	2,558,265 66.0%	758,612 72.9%	8,819,039 68.7%
Arrest	141,968 1.8%	111,728 2.9%	47,337 4.5%	301,033 2.3%
No action	165,556 2.1%	108,739 2.8%	22,892 2.2%	297,187 2.3%
Total	7,925,105	3,873,731	1,040,846	12,839,682

Traffic stops resulting in an arrest – although uncommon – provide more insight into the nature of police actions. Many arrests made by police will be preceded or followed by a search. The search may lead to an arrest – such as when a consent search produces contraband; or an arrest for criminal action, such as driving a stolen vehicle, may lead to a search incident to arrest.

There is an information gap between documentation of the nature of a traffic stop and its outcome. The initial purpose of a stop is reported and the outcome of the stop, but the sequence of events remains largely unknown. For example, a driver may be stopped for speeding but cited for a registration violation, arrested for DUI, or something else.

Among all types of stops, the events that resulted in a formal outcome are unknown. Other than DUI, it is unlikely that an arrest arising from a stop is the same as the initial purpose of the stop. In other words, drivers who are stopped for speeding are unlikely to be arrested for speeding but may be impaired, have an outstanding warrant, or something else. Smith's study also showed the importance of charges in understanding the disposition of traffic stops. Many of the stops Smith examined concluded with numerous charges – as many as 18 charges were found for one stop in their study.

The study by Smith et al. (2003) also showed the importance of knowing the severity of the offense for which the driver was stopped – such as both the posted speed of the roadway and the driver's speed. While 15 mph over the posted speed on a major highway may be a common threshold for a citation, 8 or 9 mph over the posted speed on a local thoroughfare may be a citation threshold for local police and courts. Smith found that such norms were well-established in the N.C. State Highway Patrol and there is anecdotal evidence of such norms in local law enforcement.

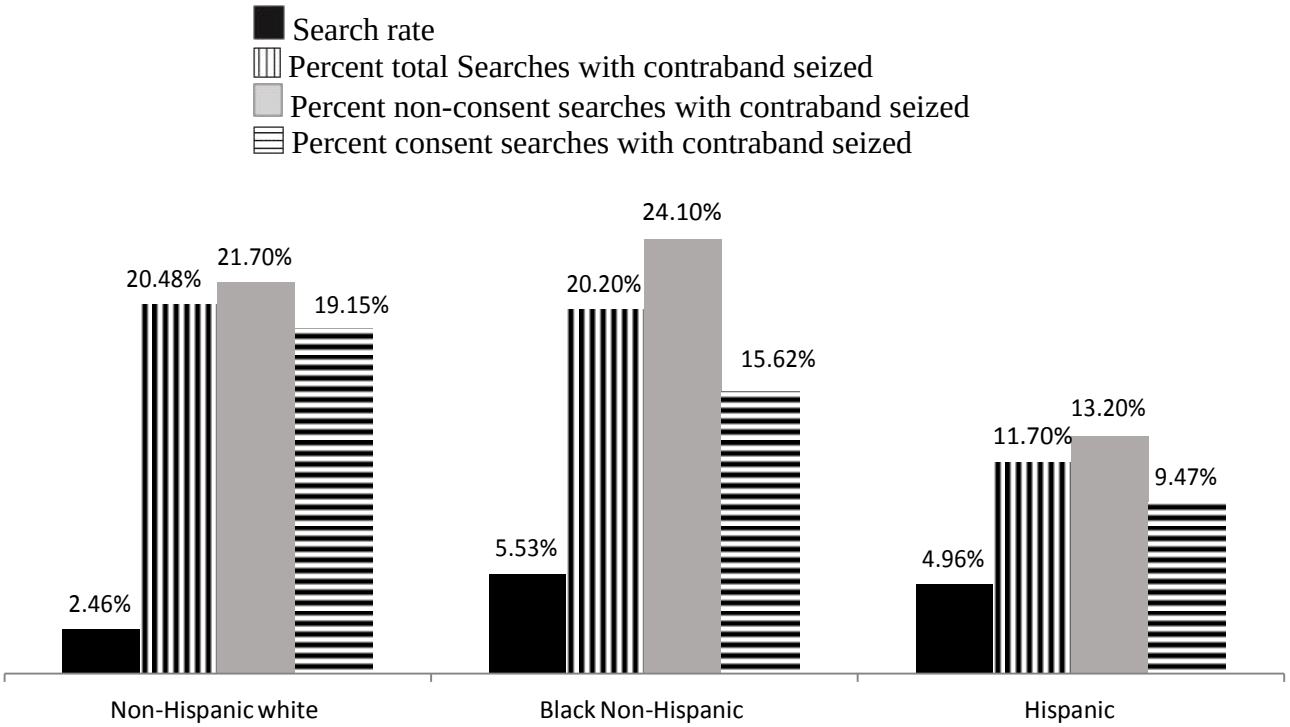
Table 13: Initial Purpose of Stop and Action Taken

	Speed limit violation	Signal violation	Driving impaired	Safe movement violation	Vehicle eqpt violation	Regulatory violation	Seat belt violation	Investigation	Other vehicle violation	Check point	Total
Verbal warning	366,811	129,118	13,109	231,554	371,121	335,662	57,592	93,308	117,687	798	1,716,760
	6.4%	21.5%	8.8%	34.1%	32.3%	17.6%	4.3%	11.2%	15.5%	1.5%	13.0%
Written warning	726,177	95,016	3,226	137,810	334,869	228,129	60,220	70,842	141,346	4,398	1,802,033
	12.6%	15.8%	2.2%	20.3%	29.2%	11.9%	4.5%	8.5%	18.6%	8.1%	13.6%
Citation issued	4,598,367	361,293	40,254	277,772	397,919	1,256,604	1,211,279	457,568	459,049	42,715	9,102,820
	79.9%	60.2%	26.9%	40.9%	34.7%	65.8%	89.9%	55.1%	60.5%	78.3%	68.8%
On-view arrest	49,467	10,781	81,266	23,437	25,437	36,863	11,302	43,890	22,699	1,829	306,971
	0.9%	1.8%	54.4%	3.4%	2.2%	1.9%	0.8%	5.3%	3.0%	3.4%	2.3%
No action taken	15,177	3,944	11,570	8,869	18,153	52,793	7,096	164,553	18,052	4,844	305,051
	0.3%	0.7%	7.7%	1.3%	1.6%	2.8%	0.5%	19.8%	2.4%	8.9%	2.3%
Total	5,755,999	600,152	149,425	679,442	1,147,499	1,910,051	1,347,489	830,161	758,833	54,584	13,233,635

Table 14: Stop, Search and Hit Rates by Racial/Ethnic Group

	Non-Hispanic White	Black Non-Hispanic	Hispanic	Total
Total stops	7,925,105 61.7%	3,873,731 30.2%	1,040,846 8.1%	12,839,682
Total searches	195,164 2.46%	192,214 4.96%	57,591 5.53%	444,969 3.47%
Consent search	88,151 45.17%	88,233 45.9%	23,174 40.24%	199,548 44.8%
Contraband seized	40,064	38,837	6,736	85,637
% all searches with contraband	20.48%	20.2%	11.7%	19.25%
Contraband seized from consent search	16,877	13,780	2,194	32,851
% consent searches with contraband seized	19.15%	15.62%	9.47%	16.46%
% non-consent searches with contraband seized	21.7%	24.1%	13.2%	21.5%

Figure 9: Search and Hit Rates by Search Type and Racial/Ethnic Group



Previous Research on Traffic Stops in North Carolina

Research in the first section of this report drew on scholarly studies carried out in Ohio, Pennsylvania, New Jersey, New York, California, Texas, Florida, Washington and Missouri. Research in the second section of the report has analyzed traffic stops in North Carolina from 2000 through 2011. In addition to our analysis, there have been several scholarly studies that have examined traffic stops in North Carolina. Many of these studies have had a major influence on other research of bias in policing. Our analysis is consistent with some of the findings but contradicts others. This section of the report contrasts and compares our findings with those in other studies (see Table 15).

In 1999, Smith et al. (2004) began a comprehensive study of racial and ethnic disparity in traffic stops of the N.C. State Highway Patrol. With funding from the National Institute of Justice, the authors sought "to produce informed answers to these questions… to shape public policy, police training, and citizen outreach" (p. 3).

The findings of this study were historic. The authors concluded:

> The simple observation of a racial disparity in police stops or searches is not sufficient evidence to support accusations of racial bias in policing. Conversely, a finding that minority drivers are stopped or searched by police in numbers roughly proportional to their incidence in the population cannot be used to rule out the possibility of biased police stops (Smith, et al., 2003, p. 37).

In other words, despite a comprehensive statewide, multi-year study funded with more than $1 million, researchers could neither establish evidence of bias in policing stops nor repudiate claims of the phenomenon. Every subsequent study of traffic stops has echoed this finding – disparities neither support nor refute claims of bias.

Smith's study preceded the mandatory collection of traffic stop data in North Carolina but much of the research focused on nearly 308,000 traffic stops voluntarily recorded by NCSHP

troopers. Researchers found there was little racial disparity in traffic stops by troopers and that searches were uncommon. Of 1,020 searches examined, the vast majority of these (767) were conducted by a specialized interdiction unit.

Smith did not rely exclusively on traffic stops to examine disparities in police practices. The researchers employed a multi-method approach with varied data sources – including a reverse records check matching cited drivers with follow-up surveys, focus groups with both minority citizens and law enforcement officers, observations of the racial and ethnic composition of a sample of roadways and variations in driving behavior, and as a denominator to calculate disparity, racial and ethnic characteristics of licensed drivers and crash involvement.

Smith et al. (2004) also found that organizational guidelines had an important impact on officer actions. For example, troopers were "expected" to issue written warnings for most equipment violations, for speeding that was not excessive, and for some other types of violations. The authors also found that these norms, as well as policies and practices, varied in important ways from one law enforcement agency to another. This finding was supported in subsequent research in the state (Warren & Tomaskovic-Devey, 2009; Warren, Tomaskovic-Devey, Smith, Zingraff, & Mason, 2006; Miller, 2009; Smith, Davison, Zingraff, Rice, & Bissler, 2004; Lippard & Page, 2011).

While Smith's study provided a roadmap for research on racial and ethnic disparities in traffic stops, it also pointed to an important flaw in making these calculations. The researchers found that many traffic stops were of drivers who did not reside in the jurisdiction. This finding clarified the flaws inherent in calculating disparities based on residential population.

Table 15: Scholarly Studies of North Carolina Traffic Stops

Scholarly Studies	Data	Publication	Funding	Finding
Smith, et al. (2003)	NCSHP stops, searches, focus groups, surveys, observations	Final Report to NIJ	NIJ	Racial disparities in stops but not stop outcome. Variations relate to context, deployment, driving behavior and other factors.
Smith, Davison, Zingraff, Rice, & Bissler (2004)	CMPD TSR and 911 calls, 2002; census data; traffic crashes	Final Report, CMPD	CMPD	Traffic stops influenced by 911 calls, contraband hits, crashes, not racial bias but varied by location.
Warren, Tomaskovic-Devey, Smith, Zingraff, & Mason (2006)	Survey, N.C. drivers, 1999-2000	*Criminology*	NIJ	Disparities in stops by local police reflect interaction of race, age, and vehicle age. No disparities in stops by SHP.
Tomaskovic-Devy, Wright, Czaja, & Miller (2006)	Self-reports, reverse record check, 2000-2001	*Journal of Quantitative Criminology*	NIJ	Drivers underreport stops and driving behaviors, minorities more so than whites.
Miller (2008)	Survey, N.C. drivers, 1999-2000	*Journal of Ethnicity in Criminal Justice*	NIJ	For local police, race, driver age and vehicle age associated with warnings; race, age, traffic convictions and driving speed associated with citations.
Miller (2009)	Survey, N.C. drivers, 1999-2000	*Journal of Criminal Justice*	NIJ	Disparities in stops for black and young drivers for some violations. Variations between law enforcement agencies.
Warren and Tomaskovic-Devey (2009)	1997-2000, NCSHP Criminal Interdiction Team stops and searches	*Criminology & Public Policy*	NIJ	Search rates of minorities declined, hit rates improved following media coverage and law requiring data.
Lippard and Page (2011)	NC TSR, 2005-2009, 32 law enforcement agencies	*Sociation Today*	None mentioned	Disparities in stops and searches of minorities higher where lower % of residential population.
Baumgartner and Epp (2012)	NC TSR, 2000-2011	Advocates for Justice	Advocates for Justice	Disparities in stops, searches, and dispositions of stops.

Following Smith's landmark study, subsequent research suggested that police behavior changed pursuant to passage of a law requiring state agencies to record data beginning in 2000 and local law enforcement in 2002. Warren and Tomaskovic-Devey (2009) found that the number of consent searches conducted by NCSHP declined after the state required troopers to document race and ethnicity in stops and searches. They also found that as consent searches were used less often, they yielded more productive searches for officers. It is not clear whether the practice of recording stops and searches reduced the number of searches, or merely shifted the type of searches conducted from consent to probable cause.

The statewide study of traffic stops was not the only research conducted by Smith and colleagues. These authors also conducted another important study of traffic stops in North Carolina and investigated disparities in traffic stops in the Charlotte-Mecklenburg Police Department (Smith, Davison, Zingraff, Rice, & Bissler, 2004). In this study, researchers used traffic stops documented by police but also incorporated other data. Their initial finding of racial disparities in traffic stops disappeared when analyses focused within specific geographic areas (police districts) and incorporated calls for service, crashes involving minorities, and the proportion of successful searches.

Lippard and Page (2011)

In their study of traffic stops and searches by 34 local law enforcement agencies in North Carolina from 2005-2009, Lippard & Page (2011) reported that some county agencies had dramatically different disparities than did the municipal police agencies. One example that the authors pointed out was Mecklenburg County. For that county, the authors reported that "Blacks in Mecklenburg County interacting with the County Sheriff's Department are 2.05 and 2.44 times more likely to be stopped compared to Whites" (unnumbered page).

Mecklenburg County, however, is unique among law enforcement agencies in North Carolina. The authors failed to note an important caveat – Mecklenburg County Sheriff's Office does not routinely conduct patrols or make traffic stops. Its mission is to run the county's jail system, provide security to the courthouse, serve criminal and civil warrants, process arrestees, monitor sex offenders, and issue weapon permits. While the agency does provide traffic support and crowd control, such as during the 2012 Democratic National Convention in Charlotte, this is not its major focus.

Over an 11 ½ year period, Mecklenburg County Sheriff's Office (MCSO) reported only 2,800 traffic stops – fewer than 250 per year on average (see Table 21) and in 2012, MCSO made only 80 traffic stops. This low number contrasts with more than 106,000 stops made by the Charlotte-Mecklenburg Police Department (CMPD) that year. The vast difference in the number of traffic stops between the two law enforcement agencies in Mecklenburg County reflects the different missions of the agencies. MCSO consolidated with CMPD in the 1990s and thus is it the role of CMPD not MCSO to address issues of road safety, as well as patrol and respond to crime in the jurisdiction. Because of this difference in the volume of traffic stops and organizational mission, Lippard & Page's (2011) finding of MCSO disparity in stops of blacks is misleading.

State of North Carolina

North Carolina's Department of Justice is tasked with "collecting, correlating and maintaining" TSR data reported by individual law enforcement agenices in the state. These data are accessible through a website maintained by DOJ and provide users an opportunity to generate eight different reports about traffic stops by jurisdiction for specified time periods. One of the reports is entitled "Drivers and Passengers Searched by Sex, Race and Ethnicity." According to

the website, this specific report provides the total number of persons searched, the total stopped and the percentage of people searched.

In reality, this statement is misleading. The report provides information on all drivers – those searched and not searched – but the only information about passengers relates to those who are searched. Thus, analysis of search rates of passengers for any agency in North Carolina consistently yields a calculation of 100%. Figure 10 displays these reports for three law enforcement agencies – the Wilson Police Department for 2010, the High Point Police Department for 2011, and the Jacksonville Police Department for 2012. In each table, the report shows the total number of passengers documented, and the total number of passengers searched. Since these numbers are the same, each report yields a search rate of 100%. Thus, in Wilson, 232 passengers were documented and 232 passengers were searched. In High Point, 352 passengers were documented and 352 were searched. In Jacksonville, 224 passengers were documented and 224 were searched. It is obvious that this calculation is not useful for understanding anything about variations in stops and searches.

TSR data do not include information about the number of demographic characteristics of passengers in stopped vehicles if they are not searched. Thus, it is unknown how many passengers are in vehicles when only a driver is searched in a stop or if no one is searched in the stop. Since searches occur in about 3% of traffic stops, it is likely that passengers are present in some, perhaps many, of the 97% of traffic stops where no search occurs.

Baumgartner and Epp (2012)

Another study of traffic stops in North Carolina was published in 2012 by Baumgartner and Epp. These researchers at UNC-Chapel Hill analyzed 13,233,635 traffic stops documented by law enforcement agencies in North Carolina from January 1, 2000 through June 14, 2011.

The report was published by the N.C. Advocates for Justice, Task Force on Racial and Ethnic Bias (Baumgartner & Epp, 2012).

The findings published by Baumgartner and Epp painted a bleak picture of law enforcement practices as the authors found substantial racial disparities in the treatment of minorities by police in North Carolina. The authors reported evidence of extreme disparities, particularly in the rates with which minorities were stopped, searched and arrested. They concluded that minorities in North Carolina were treated more harshly by police and were systematically searched more often with more serious consequences.

Because the findings of Baumgartner and Epp appeared inconsistent with contemporary policing practices, we recreated the dataset analyzed by the authors to test the veracity of their findings. The traffic stop and search data were obtained, as was the data used by Baumgartner and Epp, from the N.C. Department of Justice for the same time period of 11 ½ years. The resultant dataset consisted of 13,233,635 vehicle stops – the same as the authors.[27] The findings of our analysis were described in the preceding section of this report. In this section, we contrast our findings with those of Baumgartner and Epp and find several flaws.

The authors reported that Hispanics represented 8% of the state's population in 2010 but 25% of traffic stops at checkpoints. State law requires that officers document race or ethnicity of persons arrested, cited, and searched at checkpoints – but this information is documented for all vehicles stopped. The percentage of Hispanics stopped at checkpoints – cited or arrested – cannot be determined from the data.

Baumgartner and Epp also analyzed and found differences in the seizure of contraband among minority drivers and passengers who were searched by police. The authors reported

[27] The number of vehicle stops reported by the Baumgartner and Epp varied in their report. In the executive summary, the authors reported 13,233,648 stops while in footnote 5 they reported 12,233,635 vehicles. Our dataset consisted of 13,233,635 stops.

127,474 separate types of contraband seized in 111,332 traffic stops. This approach to calculating search hit rates was not consistent with analysis of these variables in other studies. Baumgartner and Epp summed each individual type of contraband seized – even different types within a single search – concluding there were 111,332 seizures of contraband.

Using the same data, our analysis revealed 110,868 stops in which contraband was seized. This difference is because we count a single stop as yielding one or more types of contraband; it is not logical to count all individuals in a stop when contraband is seized. Nor is it logical to count all the separate types of contraband seized in a single traffic stop as separate seizures of contraband. They then calculate racial/ethnic disparities based on each separate type of contraband. It is clear that some stops yield multiple types of contraband – such as drugs, weapons and cash. Analysis to identify disparities in the actions taken by police after a seizure of contraband should sum all types of contraband seized in a single traffic stop.

Baumgartner and Epp make another error in their analysis by identifying specific counties as having high rates of disparities in stops and searches of minorities. For example, the authors identified Burke, Cabarrus, Caldwell, Catawba, Craven, Iredell, Mecklenburg, Onslow, Orange and Wake as having disparities higher than other counties. The authors also identified numerous counties which had low rates of disparties. Among others, the low disparity counties included Buncombe, Camden, and Yancey.

An examination of the county-level data reported by Baumgartner and Epp raises questions about the veracity of their analysis – some of the counties appear to have an extraordinarily large number of traffic stops. For example, Camden County is one of the least populated states in North Carolina, with a population of less than 10,000. Baumgartner and Epp, however, reported more than 228,345 traffic stops in Camden County during the 11 ½ year

period. Similarly, the authors report 426,954 traffic stops in Yancey County which has a population of less than 18,000. In fact, the number of traffic stops reported in Baumgartner and Epp total more than 600,000 – 5% of all traffic stops in North Carolina although the two counties combined have 3/10% of the state's population (see Table 16 and Figure 11).

Baumgartner and Epp reported 6,375 DUI stops in Camden – an annual average of 554 – and 13,354 DUI stops in Yancey – an annual average of 1,161. Yet these stops are not reflected in court data for those counties. According to N.C. Administrative Office of the Courts, there were 120 DUI charges filed in Camden County in 2011-12 and 82 in Yancey County.[28]

Overall, the numbers of stops reported for both Camden and Yancey counties are highly incongruous with their small population, inconsistent with the number of court cases filed in the counties, and beyond the capacity of a limited number of law enforcement personnel. Baumgartner and Epp also attribute what appear to be erroneous counts to Burke, Cabarrus, Caldwell and Buncombe counties.

Based on analysis of the data used by Baumgartner and Epp, it appears the authors erroneously attributed stops to counties stops that were made in districts of the N.C. State Highway Patrol. It is important to note that this error in the data cannot be attributed to flaws in data reported by law enforcement agencies but to an accounting-type error made by the researchers.

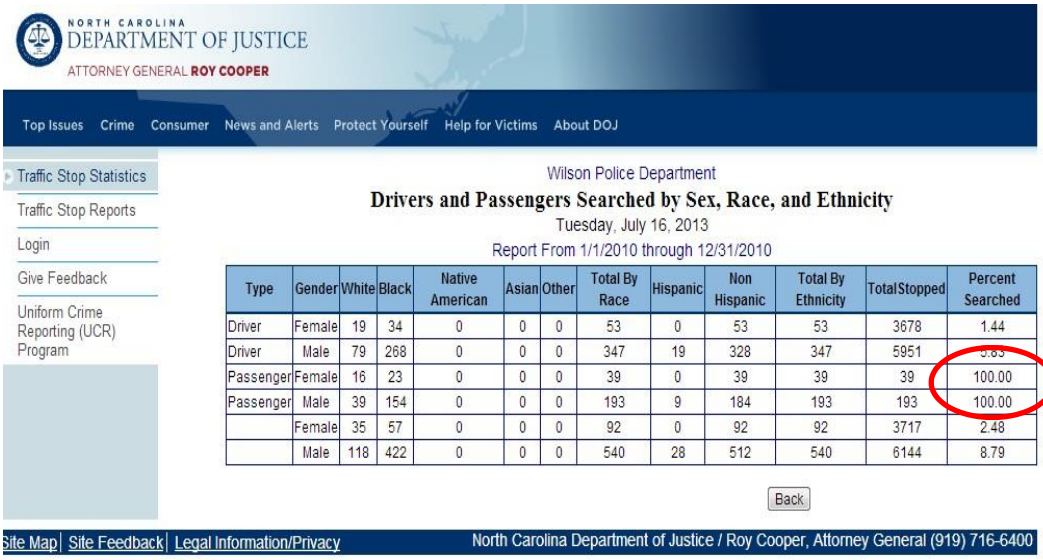
Baumgartner's analysis is also misleading because the researchers combine all drivers in traffic stops with searched passengers (see Table 17). As we have discussed earlier in this report, TSR data include all drivers – searched and not searched – as well as searched passengers. TSR data do not include any information about passengers who are not subject to a search, thus searched passengers should not be included in any calculation of racial or ethnic disparity.

[28] http://www.nccourts.org/Citizens/SRPlanning/Statistics/Default.asp

Despite these and other errors in the Baumgartner and Epp report, it remains available from Baumgartner's website and the website of the N.C. Advocates for Justice.[29] The accessibility of such reports – easily accessible to the media – perpetuates the dissemination of flawed findings. Mance (2012), for example, reported "alarming pockets of heightened race-based policing" in North Carolina, citing the erroneous findings reported by Baumgartner and Epp (p. 23).

[29] The report is posted on Baumgartner's website at http://www.unc.edu/~fbaum/papers/Baumgartner-Traffic-Stops-Statistics-1-Feb-2012.pdf and the website of the North Carolina Advocates for Justice – https://www.ncaj.com/index.cfm?pg=search&bid=714&sid=5093484&s_a=doSearch.

Figure 10: Percent of Passengers Searched, Wilson, High Point and Jacksonville



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Wilson Police Department

Drivers and Passengers Searched by Sex, Race, and Ethnicity

Tuesday, July 16, 2013

Report From 1/1/2010 through 12/31/2010

Type	Gender	White	Black	Native American	Asian	Other	Total By Race	Hispanic	Non Hispanic	Total By Ethnicity	Total Stopped	Percent Searched
Driver	Female	19	34	0	0	0	53	0	53	53	3678	1.44
Driver	Male	79	268	0	0	0	347	19	328	347	5951	[illegible]
Passenger	Female	16	23	0	0	0	39	0	39	39	39	100.00
Passenger	Male	39	154	0	0	0	193	9	184	193	193	100.00
	Female	35	57	0	0	0	92	0	92	92	3717	2.48
	Male	118	422	0	0	0	540	28	512	540	6144	8.79

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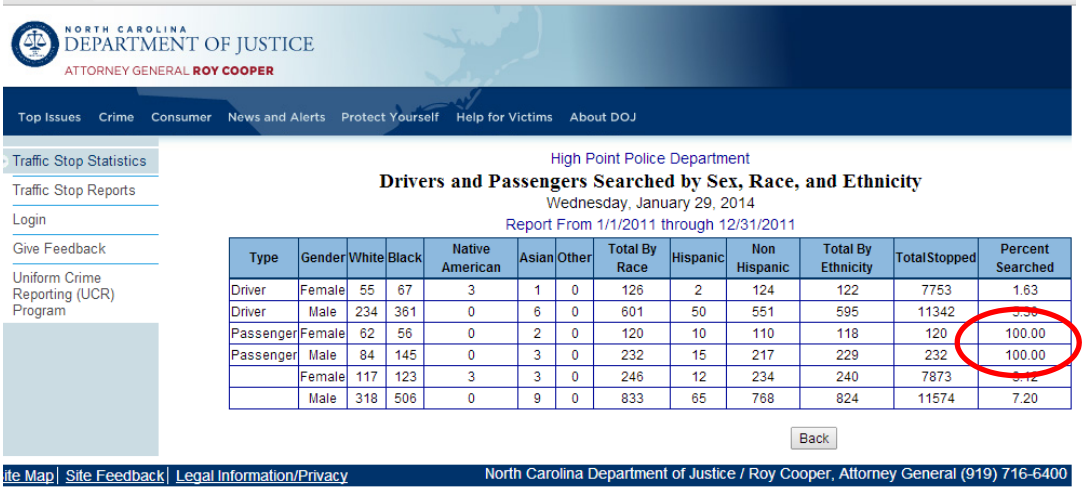

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High Point Police Department

Drivers and Passengers Searched by Sex, Race, and Ethnicity

Wednesday, January 29, 2014

Report From 1/1/2011 through 12/31/2011

Type	Gender	White	Black	Native American	Asian	Other	Total By Race	Hispanic	Non Hispanic	Total By Ethnicity	Total Stopped	Percent Searched
Driver	Female	55	67	3	1	0	126	2	124	122	7753	1.63
Driver	Male	234	361	0	6	0	601	50	551	595	11342	[illegible]
Passenger	Female	62	56	0	2	0	120	10	110	118	120	100.00
Passenger	Male	84	145	0	3	0	232	15	217	229	232	100.00
	Female	117	123	3	3	0	246	12	234	240	7873	[illegible]
	Male	318	506	0	9	0	833	65	768	824	11574	7.20

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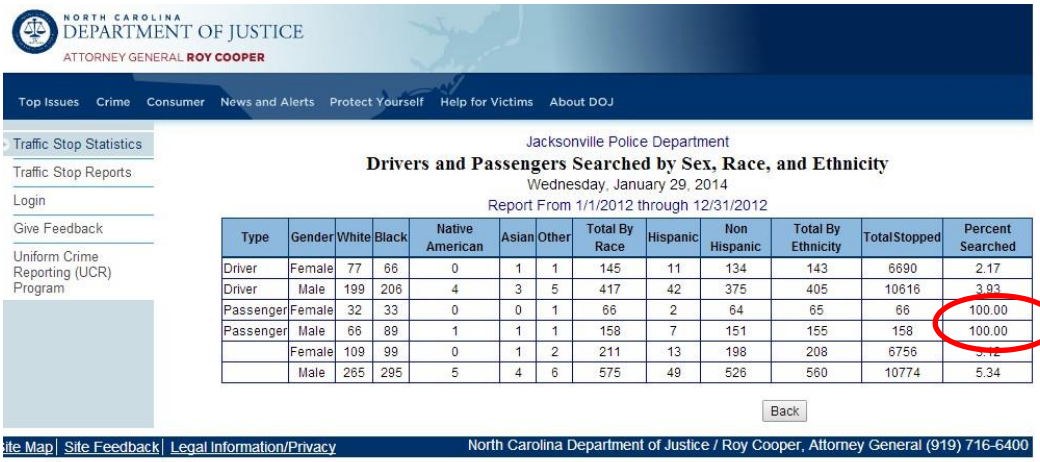

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Jacksonville Police Department

Drivers and Passengers Searched by Sex, Race, and Ethnicity

Wednesday, January 29, 2014

Report From 1/1/2012 through 12/31/2012

Type	Gender	White	Black	Native American	Asian	Other	Total By Race	Hispanic	Non Hispanic	Total By Ethnicity	Total Stopped	Percent Searched
Driver	Female	77	66	0	1	1	145	11	134	143	6690	2.17
Driver	Male	199	206	4	3	5	417	42	375	405	10616	3.93
Passenger	Female	32	33	0	0	1	66	2	64	65	66	100.00
Passenger	Male	66	89	1	1	1	158	7	151	155	158	100.00
	Female	109	99	0	1	2	211	13	198	208	6756	[illegible]
	Male	265	295	5	4	6	575	49	526	560	10774	5.34

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Table 16: Traffic Stops reported by Baumgartner & Epp, Selected Counties

	Total stops	Burke	Cabarrus	Caldwell	Buncombe	Camden	Yancey
Speed limit	5,782,202	32,941	641,959	23,553	772,564	N/R	28,311
Signal violation	612,347	19,856	33,244	16,761	27,840	7,870	13,371
Driving impaired	165,109	12,359	11,203	13,452	16,544	6,375	13,364
Safe movement	702,802	36,640	49,093	32,006	44,599	14,090	19,717
Vehicle Equipment	1,192,775	57,936	110,861	53,334	66,914	30,925	41,871
Vehicle Regulatory	1,958,495	92,798	158,438	92,155	103,983	26,345	55,880
Seat belt	1,359,092	154,328	220,678	146,967	187,071	68,887	129,263
Investigation	872,679	71,856	87,248	74,610	91,492	39,690	81,673
Other	777,531	53,214	74,870	53.042	80,175	30,275	39,464
Checkpoint	53,927	5,552	8,343	6,690	6,531	3,888	4,040
Total stops	13,476,953	537,480	1,395,937	459,581	1,397,713	228,345	426,954
Percent of stops		4.0%	10.4%	3.8%	10.4%	1.7%	3.2%
Total population (2010)	9,535,483	90,912	180,000	80,000	240,000	9,980	17,774
Percent NC population		1.0%	1.9%	0.9%	2.4%	0.1%	0.2%

Figure 11: Traffic Stops in Selected Counties Reported by Baumgartner & Epp (2012)

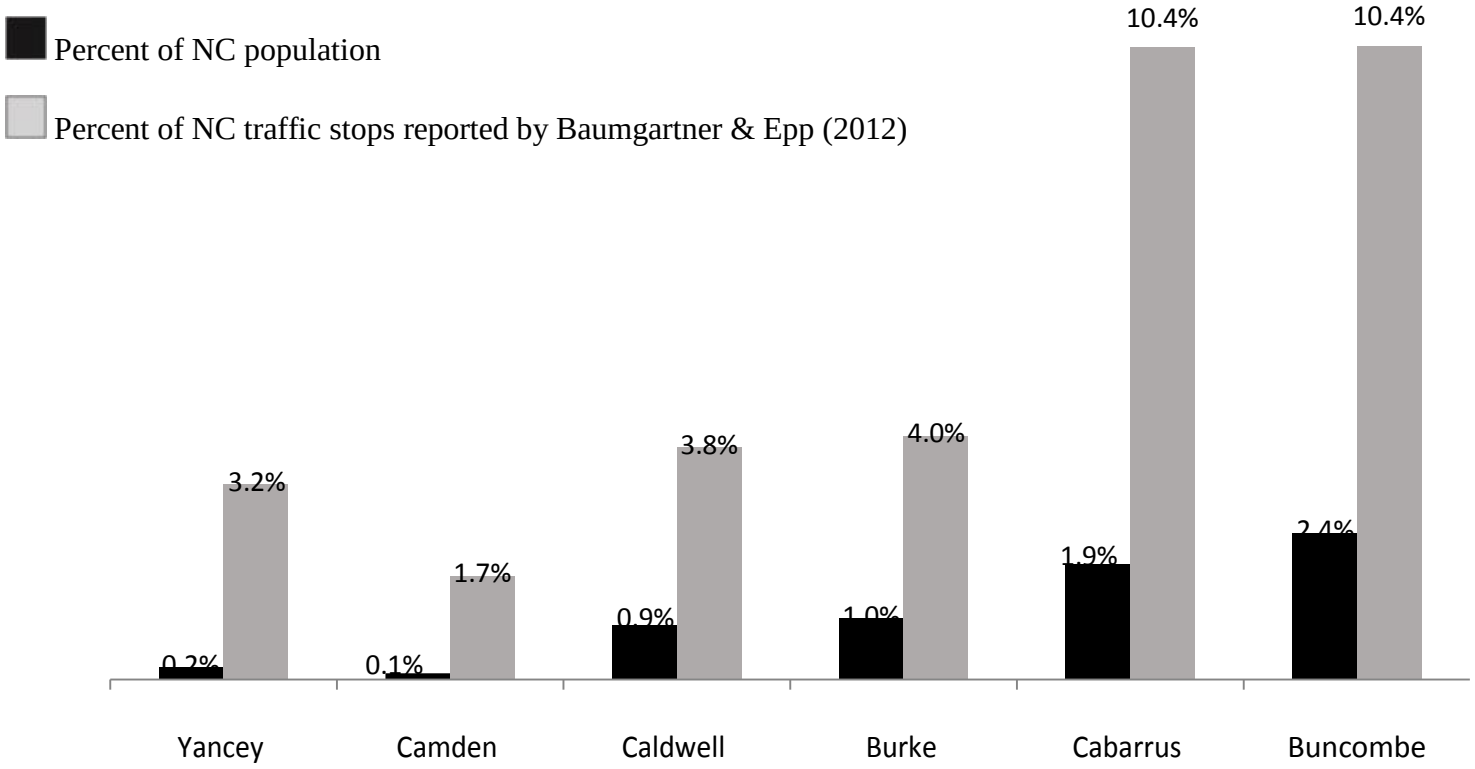

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Table 17: Drivers Stopped v. Drivers Stopped and Searched Passengers

	Baumgartner & Epp (Drivers + Searched Passengers)	**Traffic Stops (Drivers only)**
Speed limit	5,782,202 42.9%	5,755,999 43.5%
Signal violation	612,347 4.5%	600,152 4.5%
Driving impaired	165,109 1.23%	149,425 1.1%
Safe movement	702,802 5.2%	679,442 5.1%
Vehicle Equipment	1,192,775 8.9%	1,147,499 8.7%
Vehicle Regulatory	1,958,495 14.5%	1,910,051 14.4%
Seat belt	1,359,092 10.1%	1,347,489 10.2%
Investigation	872,679 6.5%	830,161 6.3%
Other	777,531 5.8%	758,833 5.7%
Checkpoint	53,927 0.4%	54,584 0.4%
Total stops	13,476,953	13,233,635

Best Practices in Detecting Disparities in Traffic Stops

This report has examined how inconsistences in traffic stop data and analysis produce differing estimates of racial bias in police stops and outcomes. Researchers routinely make decisions about organizing data, assessing data quality and appropriate analysis. One of the primary reasons that scholars review published literature is to insure that their data and analytic decisions are consistent with other studies.

In analyzing traffic stop data, the following practices have been established in the scholarly literature:

1. Establishing benchmark comparisons
2. Disaggregating data
3. Incorporating other explanatory variables
4. Distinguishing types of searches

While these approaches improve upon claims of bias drawn from simplistic analyses, they do not fully explain disparities that may be observed.

Establishing Benchmark Comparisons

To calculate racial and ethnic disparities in traffic stops, researchers historically select a benchmark with which to make a comparison. This permits researchers to compare the proportion of drivers stopped to their proportion as evidenced in some other measure. Baumgartner and Epp (2012) used census data to compare the racial and ethnic population of the state and compared this with the overall racial and ethnic proportion of drivers (and searched passengers) in North Carolina from 2000 to 2011.

As described earlier in this report, census distributions are not considered valid measures to make such comparisons. In a previous study of traffic stops and searches in North Carolina,

researchers rejected the use of census data to determine disparities with the racial composition of drivers stopped. Initial analysis by Smith, et al. (2004) "revealed considerable variation in the proportion of drivers who are African American across even very proximate locales." By examining a range of other sources of data, the researchers determined that the racial proportion of drivers involved in collisions was more closely correlated with the racial proportions of drivers. To redress the problem, the authors recommended that the racial distribution of persons involved in collisions be used as a proxy for the racial composition of drivers on roadways. As an alternative benchmark, Lippard and Page (2011) used adjusted census data to make a comparison of jurisdictions in North Carolina, estimating the *driving age* population for each jurisdiction in their analysis – both municipalities and counties – from annual estimates of the American Community Survey.

Researchers widely agree that census data are flawed for making comparisons with traffic stops because persons who are stopped are often not residents of the jurisdiction – the amount of local v. non-local traffic varies dramatically from one jurisdiction to another. The racial and ethnic composition in North Carolina has changed dramatically in many counties in the last decade. The state's overall population has increased by more than 6%— rising from 8,049,313 to 8,535,401 from 2000 to 2010.

Research on racial bias in policing has consistently recognized that comparisons of racial or ethnic proportions of traffic stops must be made with contemporaneous benchmarks to yield valid findings (Gold, 2003). For example, in North Carolina, the percentage of the population that is white dropped from 70% to 65% in the last decade, while the prevalence of Hispanics nearly doubled and the proportion of Asians climbed from 1.4% to 2.3%. Such analyses also incorporate additional factors that influence police decision-making, using small geographic

areas to evaluate disparities and examining varied benchmarks – including crashes, licensed drivers, traffic volume, commuting patterns and other factors (Fridell, 2005). For example, Smith, Davison, Zingraff, Rice, & Bissler (2004) found the inclusion of crashes, geographic area and calls for service contributed to understanding the role of race in traffic stops and searches.

Disaggregating Data

The data used by Baumgartner and Epp (2012) consisted of all traffic stops documented by all law enforcement agencies in the state of North Carolina for a period of 11 ½ years. Mance (2012) interpreted this aggregation – which resulted in a dataset of over 13,000,000 traffic stops – as providing a robust dataset for analysis. This is an erroneous conclusion. Aggregation of data obscures important patterns over time, differences between organizations, geographic areas and officers.

Time periods. Aggregating traffic stops over long periods masks changes that would be expected. Baumgartner and Epp (2012) combined traffic stops over more than a decade and this conceals changes that may have occurred over time. In a period of just two- years, Warren and Tomaskovic-Devey (2009) found that attention to bias changed the nature of police actions in North Carolina. Since data has now been collected in North Carolina for more than a decade, it is reasonable to expect improvements in bias. Analysis of aggregate data over time masks any improvements or decrements in stop or search practices or other important contextual issues including responses to laws, changes in leadership and resources, crime or public safety problems, and community needs.

Organizations. Aggregating traffic stops across law enforcement agencies masks important differences between organizations. In aggregating traffic stops to the county level,

Baumgartner and Epp (2012) combined stops carried out by nearly 300 different law enforcement agencies and quite different types of law enforcement agencies.

Many counties in North Carolina contain numerous local law enforcement agencies that report stop data. Wake County, for example, has more than 10 law enforcement agencies that report stop data and there are also numerous state law enforcement agencies that conduct and report stops in the county.[30]

Different law enforcement agencies and different types of law enforcement agencies serve different populations, and vary in leadership, resources, responsibilities and public safety problems. As seen in Table 21, the nearly 300 agencies reporting stops in North Carolina include municipal and campus police, state parks, hospital, county sheriffs, ALE, DMV and others. In aggregating stops to the county level, the researchers have combined very diverse agencies. Lippard and Page (2011) found there were substantial differences in traffic stops in North Carolina between municipal police and county law enforcement agencies within the same county.

Aggregation within jurisdictions. Current research on policing has consistently emphasized the importance of place and recognition of racial and ethnic heterogeneity within areas. Smith et al. (2004) found there were substantial differences in the racial composition of roadways within very small areas, and the composition also varied by time of day. Researchers recommend using the smallest geographic unit available for analysis to distinguish variation between places. Data recorded in North Carolina TSR do not include the *specific* location of

[30] An analysis of traffic stops for 10 different law enforcement agencies in Wake County revealed very different practices regarding the volume of stops and searches in 2011. The Zebulon Police Department stopped nearly five times as many vehicles as did the Wake Forest Police Department although Zebulon has less than ¼ the population of Wake Forest. There has been no research or any recommendation to aggregate different law enforcement agencies for analysis of stops and searches, and the heterogeneity of law enforcement practices reveals the misleading consequences of doing so.

stops – providing no mechanism to determine if an individual stop occurred in a high crime area, a location with a large volume of crashes, or another characteristic. At least some law enforcement agencies record geographic characteristics of stops such as police districts or beats, address or x-y coordinates, and thus have the ability to map or analyze the spatial distribution but this information is not in the state database.

Aggregation of officers. Research has consistently shown that individual officers vary in stops and searches – factors related to geographic assignment or unit, and this is also reflective of officer characteristics such as their age, experience, gender, and race. Some research has suggested that bias identified in some law enforcement agencies is not systemic but reflects a few "bad apples." In North Carolina's TSR data, information about individual officers is documented through unique officer identification numbers. These provide an important basis to examine variations in individual level behavior.

In a follow-up study, Baumgartner analyzed searches made by law enforcement officers in North Carolina who searched a greater proportion of blacks (or Hispanics) relative to whites. One officer identified by Baumgartner as having a disparate ratio of searching blacks relative to whites, achieved this distinction by making 575 traffic stops in 11 ½ years, however, this officer conducted a total of five searches over the period. Another officer reported by Baumgartner as having a high ratio of searches of blacks relative to whites made 1,665 stops in 11 ½ years and searched only 12 individuals –one white person and 11 blacks. While these officers searched a greater proportion of blacks than whites, the extraordinarily low volume of searches makes the usefulness of these findings questionable. Further, Baumgartner did not report the type of searches conducted by these officers. This is important information as officers have little discretion in conducting searches under some conditions.

Incorporating Other Explanatory Variables

Early analysis of traffic stops often relied on a limited amount of information to detect disparities or bias by police and used simplistic correlational analysis to determine disparities. More mature research has increasingly incorporated a wider range of variables. These studies have contributed to understanding that race and ethnicity are factors in stops and searches but recognize there are complexities in understanding officer-driver interaction. A growing amount of research suggests that race and ethnicity are not solitary factors but interact with other variables in traffic stops and outcomes.

Research to disentangle disparity and bias have increasingly identified factors that interact with, mediate or explain variations in stop and search rates by police. These factors and others have been identified as salient in understanding patterns and disproportionality of police stops and searches. Characteristics of drivers, officers, and situational context are all important.

The inclusion of additional variables in traffic stop analysis has necessitated more robust statistical techniques and researchers have largely concluded that correlational analysis – although easy to understand – is too simplistic to model the complex sequence of events that can occur in a traffic stop. Use of simple bivariate techniques produces misleading findings. Increasingly, research on police bias uses multivariate statistical techniques; these weigh the relative contribution of numerous factors to disentangle how actions in traffic stops are influenced by race combined with other factors. Contemporary analysis of traffic stops also increasingly uses statistical techniques to examine how a series of police actions are nested or sequenced, with one action influencing or constraining a subsequent action. The simple bivariate techniques are more appropriate in analyses of initial stops, but multivariate techniques are fundamental in examining the outcomes of traffic stops.

Distinguishing Types of Searches

The distinction between different types of searches was discussed earlier in this report. Most contemporary research emphasizes the importance of distinguishing between low-discretion searches – such as probable cause, search warrants and those that occur incident to arrest – from high-discretion searches (Pickerill, Mosher, & Pratt, 2009; Engel & Calnon, 2004; Engel, 2008; Rosenfeld, Rojek, & Decker, 2012). As Engel (2008) determined, blacks were more likely to be searched but they were also more likely to be arrested. Overall, of the 6.6% of drivers who were searched, 52% were arrested. In the analysis in North Carolina, 3.47% of drivers were searched (452,751) and 43.5% of all searched drivers were arrested (193,534). The likelihood of arrest following a search varied across the three racial and ethnic groups. Overall, 5.5% of Hispanic drivers were searched, and 50.6% of those searched were arrested. About half as many white drivers as black drivers were searched, but whites were more likely to be arrested than were blacks (see Table 18). The differences in search and arrest rates varied based on the type of search conducted. A similar proportion of consent searches resulted in arrests for both non-Hispanic whites and non-Hispanic blacks – 11.8% and 11.6%, respectively – while 9.0% of consent searches of Hispanics resulted in arrest.

Table 18: Percent of Searches resulting in Arrest

	Stops	Searches as % of stops	Arrests as % of searches	Arrests as % of consent searches
Non-Hispanic white	7,925,105	195,164 2.46%	87,744 44.9%	11.75%
Non-Hispanic black	3,873,731	192,214 4.96%	76,650 39.9%	11.6%
Hispanic	1,040,846	57,591 5.53%	29,140 50.6%	8.96%
Total	12,839,962	444,969 3.47%	193,534 43.5%	11.3%

These findings demonstrate the importance of distinguishing types of searches – separating discretionary searches – those conducted *prior* to an arrest – from searches conducted *after or pursuant* to an arrest –searches with low discretion. Baumgartner and Epp reported that blacks and Hispanics were much more likely than whites to be arrested; this analysis, however, shows that arrests are closely related to searches – even within consent searches where one might expect to see racial disparity if police bias were reflected.

Enhancing the Usefulness of Traffic Stop Data

The future of research – and related policies – to effectively identify and prevent racial and ethnic bias by police in North Carolina depend largely on the accuracy and utility of data being recorded by law enforcement officers. Despite the participation by nearly 300 law enforcement agencies in documenting more than 15,000,000 stops since 2000, the data are insufficient to detect or rule out police bias. In large part, the data reveal only that officers in North Carolina make many traffic stops. If traffic stop data continue to be collected by law enforcement and made available for analysis of racial disparities in North Carolina, there are important issues of quality that should be addressed. TSR data and appropriate analyses can advance police-citizen dialogue about racial and ethnic bias in traffic stops in North Carolina if quality control issues are addressed in data currently collected by the state.

While there is some potential to make greater use of traffic stop data, such as using it to evaluate NC AWARE and assess the extent to which this resource provides assistance to law enforcement officers, some consideration should be given to the need to continue data collection. While only a few jurisdictions have moved in this direction, Texas requires only limited traffic stop data from law enforcement agencies that equip patrol cars with video cameras and maintain tapes after stops. This may be an approach to ensure civil rights protections to citizens while eliminating recording data that has limited utility.

Monitoring Data Quality

The procedures for law enforcement agencies to document and report TSR data were discussed earlier in this report. Each individual agency documents and submits data to the N.C. Traffic Stop Statistics Reporting Program. The program only compiles the data and does not review, audit, or analyzed the information. This is made clear to reporting law enforcement

agencies: “It is the responsibility of each agency to monitor submitted data of traffic stop reports” (p. 3) (SBI, 2009).

Without an audit or review, it is likely that there are flaws or inaccuracies in data submitted. It is not clear that the data are routinely submitted by all agencies required to report nor that the data are submitted in a timely way. A cursory examination of the state’s website revealed numerous law enforcement agencies required to report but documenting no stops or searches over a year (see Table 19 for an example). On the TSR website, the following disclaimer is made:

> “[A]n agency's traffic stop data may be low or non-existent for any given month due to the nature of that agency's law enforcement responsibilities.”[31]

Lippard and Page (2011) found missing information for many North Carolina agencies in their analysis. In its civil rights investigation, the U.S. Department of Justice reported that Alamance County Sheriff’s Office failed to record many traffic stops.

In other states, researchers have questioned the validity of traffic stop data recorded by law enforcement officers. Some errors have been attributed to sloppiness, while others were attributed to purposeful manipulation of the data by police (Lundman, 2010; Warren, Tomaskovic-Devey, Smith, Zingraff, & Mason, 2006). In Oakland, about 10% of stops were missing data (Grogger & Ridgeway, 2006). Lundman (2012) pointed out that officers may purposefully submit erroneous data because of their concerns that the data can be easily manipulated or misinterpreted to make erroneous conclusions about police activities.

The North Carolina General Assembly or N.C. Department of Justice should be encouraged to monitor and audit traffic stop data to insure it meets minimum standards of quality. Currently, it is unknown if law enforcement agencies routinely collect and enter this data

[31] http://trafficstops.ncdoj.gov/Default.aspx?pageid=2

on the state's website, and if the data submitted are valid and reliable. In collecting these data and making them available for analysis, the state has a responsibility to make a minimal effort to ensure the data are submitted, and perform checks on the veracity of the data. Without any type of audit process, the current quality of the data – which is unknown – is likely to decline.[32] As indicated earlier in this report, the Civil Rights Division of the U.S. Attorney's Office noted that Alamance County Sheriff's Office had failed to report or underreported the number of traffic stops made of Hispanics (Perez, 2012). A spot check of data reported by agencies in 2013 revealed many empty tables such as the one displayed in Table 19.

Table 19: Sample Reporting Table for Agency Required to Report, 2013

Initial Purpose of Traffic Stop by Driver's Age

Saturday, February 15, 2014

Report From 1/1/2012 through 12/31/2012

Purpose	Under 20	20-24	25-29	30-34	35-39	40-49	50-59	Over 59	Total
Speed Limit Violation	0	0	0	0	0	0	0	0	0
Stop Light/Sign Violation	0	0	0	0	0	0	0	0	0
Driving While Impaired	0	0	0	0	0	0	0	0	0
Safe Movement Violation	0	0	0	0	0	0	0	0	0
Vehicle Equipment Violation	0	0	0	0	0	0	0	0	0
Vehicle Regulatory Violation	0	0	0	0	0	0	0	0	0
Seat Belt Violation	0	0	0	0	0	0	0	0	0
Investigation	0	0	0	0	0	0	0	0	0
Other Motor Vehicle Violation	0	0	0	0	0	0	0	0	0
Checkpoint	0	0	0	0	0	0	0	0	0
Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Validity checks would be useful to detect other data problems by identifying agencies with numbers that were inconsistent with other agencies. In 2013, the Fayetteville Police Department identified a problem with the way their agency's IT system counted searches. Data auditing could have assisted the agency with identifying this problem much sooner.

[32] As indicated earlier in this report, the Civil Rights Division of the U.S. Attorney's Office noted that Alamance County Sheriff's Office had failed to report or underreported the number of traffic stops made of Hispanics (Perez, 2012).

Assessing Data Validity

The validity of racial and ethnic classification of drivers and searched passengers is questionable. Accurately identifying an individual's race and ethnicity through visual assessment is a difficult task yet law enforcement officers are required to do this for all drivers stopped and any passengers who are searched. More than 40 years ago, the U.S. Census abandoned the practice and relied on self-identification by individuals of their race and ethnicity.

According to Hickman (2005), law enforcement agencies vary in how officers determine race and ethnicity. Observations are used in some police agencies; others use their state Department of Motor Vehicle (DMV) records; and others ask motorists.

Race and ethnicity is not included on drivers' licenses in North Carolina; thus, officers must either guess or ask an individual's race and ethnicity. The Data Collection Resource Center at Northeastern University reported that such inquiries "risk exacerbating tensions during what may already be a tense encounter."

Numerous scholars have questioned the validity of racial and ethnic identification recorded by police (Liederbach, Trulson, Fritsch, Caeti, & Taylor, 2007; Alpert, Smith, & Dunham, 2004; Lundman & Kowalski, 2009; Lundman, 2010). In North Carolina, the SBI advises officers:

"Information about a person's race and ethnicity may be obtained from direct communication or from a driver's license. [This d]etermination may also be made based on the officer's observation and discretion" (SBI, 2009, p. 1).

Officers cannot determine this information from the North Carolina driver license – neither race nor ethnicity are published on licenses in the state. It is likely that many officers may guess at race or ethnicity – not only of drivers, but also of searched passengers. Visual

identification of an individual's race and ethnicity –under the varying conditions in which a traffic stop occurs— is inherently difficult and this study suggests that officers do not classify persons consistently and probably not accurately.

Questions about the validity of race and ethnicity as documented by police in traffic stops have been raised previously. In their study of traffic stops in North Carolina nearly 10 years ago, Smith et al. (2004) expressed skepticism about the accuracy with which troopers classified the race of Hispanics. In that study, 89.5% of Hispanic drivers were classified as of "unknown" race. While it is likely that the majority of Hispanic drivers stopped in North Carolina were white, Smith felt troopers were unclear about the distinction between race and ethnicity.[33]

In another study of traffic stops in North Carolina, Lippard and Page (2011) encountered a similar problem; they combined Hispanic drivers with non-Hispanic white drivers with the following logic:

> "[W]e were not able to distinguish "Hispanics" from the racial categories; therefore, Hispanics can be of any race. While we cannot separate Hispanics from other racial categories, we viewed this as providing a conservative estimate of the treatment of Hispanics and other groups compared to Whites" (p. 21).

Their analysis subsequently focused on comparing whites to non-whites, with the latter category comprised of blacks, Native Americans, Asians and "other."

Baumgartner and Epp (2012) appeared to use a similar rationale in their analysis; however, they chose to omit the "smaller" categories of race from their analysis – presumably Asian and Native American.

It is not only law enforcement officers in North Carolina who are inconsistent in their racial classification of Hispanics. Inmates in North Carolina's correctional system self-identify their race and ethnicity upon entry. Among 21,201 inmates admitted in 2012, 969 or 4.6% self-

[33] Most Hispanics in the United States are classified as white, according to the U.S. Census.

identified as Hispanic/Latino ethnicity. However, the vast majority of Hispanic inmates – 89% – identified their race as "other"; only 7% of Hispanic inmates classified their race as white, and 1.86% were classified as black.

The current practice of documenting both race and ethnicity in traffic stops exceeds the requirements of state law. North Carolina General Statutes specify that officers must record the race ***or*** ethnicity of a driver stopped; however, the stop report used by officers – and available on the NCDOJ website – includes both race and ethnicity.

Incorporating Additional Variables

Although numerous variables are recorded in traffic stops, not all useful information is documented. Because research suggests that non-residents of a jurisdiction influence stops and searches, the Racial Profiling Data Collection Resource Center at Northeastern University recommends that officers document the residence of the driver, identifying if the individual is a resident of the jurisdiction in which he or she was stopped.

Some additional information is also needed in traffic stop documentation to clarify the sequence of events that occur during a stop. Currently, officers document the sequence by making a decision to initiate a traffic stop and articulating the initial purpose of the stop. After the stop, however, a varied sequence of events may occur and the initial purpose of the stop may not correspond with the disposition of the stop. For example, a driver may be stopped for speeding and the stop may conclude with an arrest. It is highly unlikely that the driver is arrested for speeding, however, this is unknown. There is no indication of the nature of the arrest or charges, or the events that lead to the arrest. The following are all possible scenarios:

- Stopped for speeding, an officer runs a warrant check on a driver and finds an outstanding warrant.
- Stopped for speeding, an officer discovers that the vehicle is stolen.

- Stopped for speeding, an officer smells alcohol and conducts a field sobriety test.
- Stopped for speeding, a driver is asked for consent. A consent search yields contraband.
- Stopped for speeding, a driver lowers the window of the vehicle and an aroma of marijuana is emitted.

In some cases, the sequence of events may be inferred from a stop, however, it is obvious that data currently recorded has gaps that obfuscate the sequence of events that may occur in a stop and prevent researchers from drawing conclusions about the stop.

While data currently document the initial purpose of a traffic stop, this classification is vague. Traffic stops for speeding vary in severity – a stop for speeding 30 mph over the posted speed will result in a very different outcome for a driver than a stop for 10 miles over the posted speed. The severity of the offense or infraction – such as the recorded speed and posted speed – should be documented.

There are other problems with the data currently documented.

- Officers record the initial nature of the traffic stop – such as speeding or a signal violation. There is no record, however, if the outcome of the stop differs. Traffic stop reports do not reveal the severity of the initial stop, or the nature of a subsequent arrest, nor the number or type of charges.

- Local law enforcement officers in North Carolina record the location of each stop by identifying the city or county in which the stop occurred while state troopers record one of 53 patrol districts. Many of the SHP districts consist of two or more counties and general location information does not identify the roadway or any specific area within the location.

  Every major research study on racial and ethnic bias has confirmed the importance of identifying smaller geographic areas within a jurisdiction – sub-areas – to examine the context in which the stop occurred. To be most useful, stops should not only document the county (or municipality) but, to the extent practicable, more specific geographic information such as the roadway, its street number or 100-block, nearest intersection or mile marker.

- Officers currently indicate if drivers (or passengers) were searched pursuant to a consent request. It is not known if officers asked for consent and an individual declined,

however, this information would provide a more reliable basis for comparing disparities in searches relative to stops.

Eliminating and Improving Specification of Variables

Parallel with investigating the quality of traffic stop data and developing an auditing process, the North Carolina General Assembly should be encouraged to revisit the need to collect some elements currently recorded in traffic stops – to examine the sequence and logic of some data elements.

Demographic Characteristics of Passengers

North Carolina requires demographic information to be recorded about passengers who are searched pursuant to a traffic stop; no information is recorded about passengers who are not searched. This makes it impossible to compare characteristics of searched passengers and characteristics of unsearched passengers. Despite this incongruence, the NC DOJ website calculates the percentage of passengers searched by sex, race, ethnicity and age. For all inquiries, this calculation is 100% – a misleading calculation since the number, sex, race, ethnicity and age of unsearched passengers is not recorded. (A sample of this table is shown for the three police departments in Figure 10.) If information on searched passengers is documented, it is necessary to document demographic characteristics of unsearched passengers in order to calculate disparities. This is not recommended. Officers making traffic stops are already burdened by documenting the age, gender, race and ethnicity for any searched passengers; there were more than 160,000 passengers searched from 2000-2011. Officers already have difficulty classifying these characteristics for drivers and they often have the driver's license to do so. Unless officers also obtain the driver's license for each passenger searched, they are highly unlikely to be able to accurately record age, race or ethnicity. Gender is more straightforward.

Initial Purpose of Traffic Stop

Traffic stops are distinguished by the initial purpose articulated by an officer who identifies one of 10 classifications. Six types of violations are clearly-defined concepts: speed limit violation, signal violation, vehicle equipment or regulatory violation, seat belt or safe movement violation. Four types of violations are less clearly defined and thus subject to specification or measurement error. These types include DUI, Checkpoint, Investigation, and Other Violation The likelihood of specification errors are discussed for each.

DUI. DUI is a clearly-defined concept when an officer charges a driver with this offense *following* a vehicle stop. DUI is not a clearly-defined concept when articulating the initial purpose of a traffic stop. While officers may suspect impaired driving, most DUI stops will arise from observations an officer makes of other driving infractions, including speeding, moving violations or seat belt violations. While an officer may suspect impairment based on a movement or signal violation, including DUI as an initial stop purpose seems incongruous with normal traffic enforcement practices. While 54.4% of DUI stops result in arrest – the largest share for any stop purpose – these arrests total slightly more than 81,000 for 11 ½ years.

Checkpoints. Law enforcement agencies periodically conduct checkpoints in their jurisdictions. Vehicles stopped under these circumstances are documented differently from vehicles in other types of traffic stops. State law does not require that information be reported for all vehicles at checkpoint stops. Instead, the law requires only that officers record stops and driver demographic information when arrests, citations, or searches arise from checkpoints. Since demographic information is not recorded for all vehicles and drivers stopped at checkpoints, it is impossible to calculate racial disparities for these stops. Thus, it is expected that checkpoint stops with "no action taken" or warnings would be consistently documented as

zero (0). An example of this is displayed for the Apex Police Department in 2012 (see Figure 16). The department reported 74 checkpoint stops in 2012 which resulted in arrest or citation. It is common sense to know that many checkpoint stops were made and no action occurred. The reporting guidelines, however, are not followed by all law enforcement agencies. As seen in Table 12, about 9% of 54,584 checkpoint stops in North Carolina were reported as concluded with "no action taken" and another 9.6% resulted in a verbal or written warning. This evidence shows that some law enforcement agencies record and report the range of actions taken at checkpoints although this is not required. Since some agencies submit these data and others do not, the result is an inconsistent count of stops and actions. Further, calculation of racial disparity in the disposition of stops at checkpoints is distorted by the inconsistency in how data are recorded. The state should either require racial and ethnic data to be documented for all checkpoint stops – regardless of the outcome – or none of them.

Investigation. State law does not require officers to document investigative stops. According to the SBI (2009), traffic stop reports "should not be completed" [emphasis in original] for vehicles stopped "as a result of a BOLO or Amber alert, a radio broadcast 'attempt to locate,' a warrant or stolen notice, or similar criminal investigation" (p. 2). Nonetheless, law enforcement agencies reported 830,161 investigation stops from 2000 to 2011. As displayed in Table 6, investigations were the 5th most common type of traffic stop reported and accounted for 6.3% of all traffic stops reported. This analysis suggests that the exclusion of investigation stops from traffic stop reports is either not clearly understood or the reporting guideline is not reliably followed. Further, it seems likely that law enforcement officers may make numerous investigation stops that are not documented but perhaps should be reported. The law specifies that all *routine* traffic law enforcement stops be reported, however, it is possible that the

distinction between routine and investigative stops is not clear. This results in some over-reporting – as indicated here – but likely results in more substantial under-reporting of routine traffic stops. There is no way to determine the magnitude of this phenomenon, however, the number of traffic stops classified as investigations has increased since 2000 (see Figure 12 and Figure 13) as well as its proportion of all traffic stops.

Other vehicle violations. Driving violations that cannot be classified by officers as speed, signal, safe movement, regulatory or equipment violations are classified as "other" vehicle violations. It is not known what types of violations might be classified as "other," however, officers document a large number of violations this way. More than 750,000 stops or nearly 5.7% of all traffic stops were made for other vehicle violations from 2000 to 2011 (see Table 6). Unlike investigation stops, neither the number nor the proportion of 'other' vehicle violations has increased over time. Overall, 4.8% of these stops result in a search and 3.0% result in an arrest. These outcomes underscore the need to know what types of violations comprise this category.

Basis for Searches

By statute, officers in North Carolina are required to document the basis for any search conducted pursuant to a stop. The specified bases include erratic or suspicious behavior, observation of suspected contraband, suspicious movement, informant's tip, other officer's information, or witness observation. The requirement to document the basis of a search includes those searches conducted with consent. By law, consent searches require only that the driver voluntarily consent to an officer's request to search. Since no legal basis is required for officers to request a consent search, requiring officers to do so in TSR appears to be a maneuver to discourage them from conducting such searches. As discussed previously (and shown in Figures

7 and 8), the proportion of stops with searches has declined since 2000, and the proportion of consent searches has declined even more dramatically. This outcome may have been the goal of the original legislation mandating documentation of stops and searches, however, it is not logical and raises questions about the validity of the data. As shown in Table 20, officers follow the reporting guideline and record a basis (or more than one) for each search. It seems unlikely, for example, that a consent search would be based on "official information," yet 18.3% of consent searches were recorded this way. Similarly, it seems unlikely that a search incident to arrest would be based on "erratic/suspicious behavior" – since the search follows rather than precedes the arrest – yet 34.7% of searches incident to arrest were classified this way.

The searches and their bases as documented by individual law enforcement agencies show a similar pattern of incongruence. As shown in Figure 14, one police department reported conducting 925 searches in 2012. A query of the bases for these searches – as seen in Figure 15 — reveals some inconsistencies. Police are permitted to indicate more than one basis for a search and these may result in more search bases than searches; Figure 15, however, shows that 679 search bases were documented – far fewer than the 925 searches reported by the department. DOJ's website indicates that stops may include multiple bases, however, the number of search bases should exceed not be lower than the total number of searches.

Figure 12: Number of Investigation and Other Traffic Stops

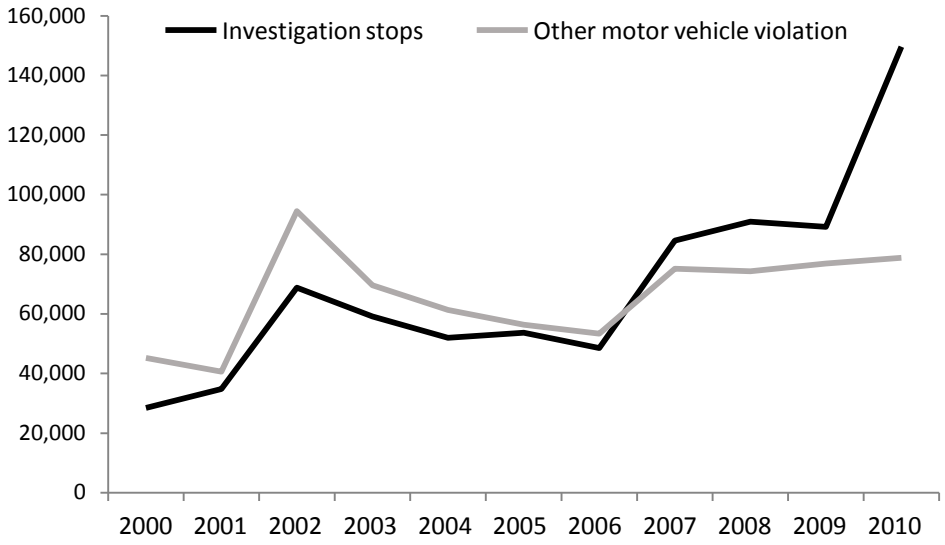

Figure 13: Traffic Stops Classified as Investigation or Other Violation

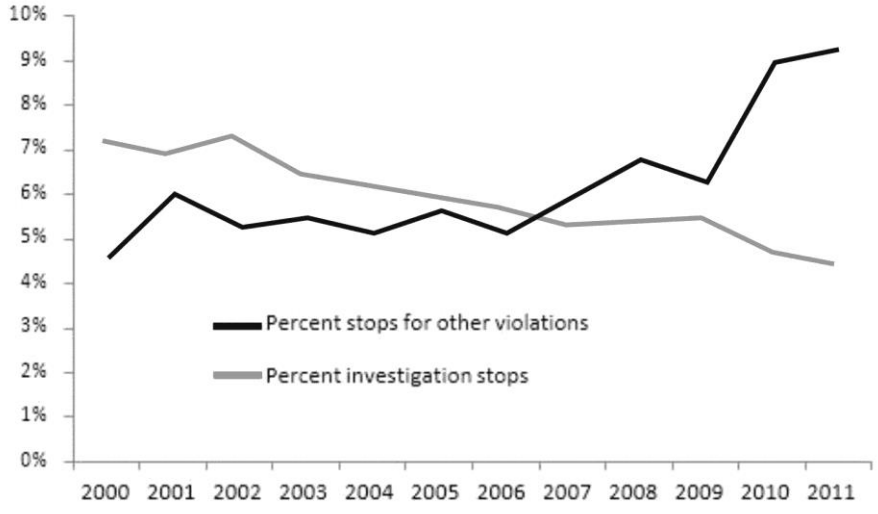

Table 20: Type of Search by Basis of Search

	Consent	Search warrant	Probable cause	Incident to arrest	Protective frisk	Total
Erratic/Suspicious behavior	116,705 57.4%	463 35.6%	16,600 20.0%	60,840 34.7%	8,024 51.9%	202,632 44.8%
Observation	24,244 11.9%	326 25.0%	27,976 48.8%	21,203 12.1%	1,206 7.8%	74,955 16.6%
Other official information	37,152 18.3%	377 29.0%	8,184 14.3%	69,987 35.9%	3,783 24.5%	119,483 26.4%
Suspicious movement	18,925 9.3%	85 6.5%	3,203 5.6%	16,877 9.6%	1,841 11.9%	40,931 9.0%
Informant tip	4,036 2.0%	17 1.3%	577 1.0%	1,767 1.0%	198 1.3%	6,595 1.5%
Witness observation	2,217 1.1%	34 2.6%	791 1.4%	4,593 2.6%	408 2.6%	8,043 1.8%
Total	203,279	1,302	57,331	175,267	15,460	452,639

Figure 14: Sample Police Department, 2012, Search Table

Drivers and Passengers Searched by Sex, Race, and Ethnicity

Friday, February 14, 2014

Report From 1/1/2012 through 12/31/2012

Type	Gender	White	Black	Native American	Asian	Other	Total By Race	Hispanic	Non Hispanic	Total By Ethnicity	Total Stopped	Percent Searched
Driver	Female	93	50	0	0	0	143	11	132	143	1551	9.22
Driver	Male	240	210	1	0	0	451	82	369	450	2283	19.75
Passenger	Female	41	48	0	0	0	89	5	84	89	89	100.00
Passenger	Male	100	143	0	0	0	243	28	215	243	243	100.00
	Female	134	98	0	0	0	232	16	216	232	1640	14.15
	Male	340	353	1	0	0	694	110	584	693	2526	27.47

Figure 15: Sample Police Department, Bases for Searches Conducted, 2012

Type of Search by Basis of Search

Friday, February 14, 2014

Report From 1/1/2012 through 12/31/2012

Type of Search	Erratic/Suspicious Behavior	Observation of Suspected Contraband	Other Official's Information	Suspicious Movement	Informant's Tip	Witness Observation	Total
Consent	175	40	26	198	33	0	472
Probable Cause	32	105	1	22	5	0	165
Protective Frisk	1	0	2	0	2	0	5
Search Incident to Arrest	4	1	2	30	0	0	37
Search Warrant	0	0	0	0	0	0	0
Total	**212**	**146**	**31**	**250**	**40**	**0**	**679**

Stops may include multiple bases of search for each stop and totals may not equal total searches

Figure 16: Disposition of Traffic Stops at Checkpoints, Apex Police Department

Apex Police Department

Initial Purpose of Traffic Stop by Enforcement Action Taken

Friday, February 14, 2014

Report From 1/1/2012 through 12/31/2012

Purpose	Verbal Warning	Written Warning	Citation Issued	On View Arrest	No Action Taken	Total
Checkpoint	0	0	64	10	0	74
Driving While Impaired	6	0	3	22	10	41
Investigation	44	0	58	16	98	216
Other Motor Vehicle Violation	63	39	155	15	6	278
Safe Movement Violation	197	67	109	11	4	388
Seat Belt Violation	45	50	343	5	5	448
Speed Limit Violation	133	173	1057	10	3	1376
Stop Light/Sign Violation	93	71	119	1	0	284
Vehicle Equipment Violation	300	116	81	10	2	509
Vehicle Regulatory Violation	590	341	875	29	51	1886
Total	**1471**	**857**	**2864**	**129**	**179**	**5500**

Back

Analyzing Traffic Stop Data

Unlike many other states, North Carolina does not do anything with TSR data. Some states – including Missouri, Nevada and Texas – produce annual reports, and other states have commissioned research from scholars on trends in traffic stops. Data can be downloaded from the North Carolina website and simple cross-tabulations of summary data can be carried out. If traffic stop data continue to be recorded in North Carolina, some effort should be made to routinely analyze these data and demonstrate their usefulness – or lack thereof in addressing concerns about racial and ethnic bias. Routine analyses – conducted by or supervised by the Office of the Attorney General or another neutral party – could ascertain the utility of data, and provide important information to both the citizens of North Carolina and law enforcement executives.

Routine analysis of stops and searches within individual law enforcement jurisdictions may reveal disparities that relate to bias in the practices of that agency. Some law enforcement agencies in North Carolina already do this, particularly those accredited by CALEA. Other agencies, however, may lack the capacity to undertake such analysis. Within the state, it would be useful to establish peer groups of comparable agencies based on residential population, traffic volume, number of sworn law enforcement officers, volume of crime and other key explanatory variables.

Following the guidelines made by Fridell (2005), such a procedure would establish a mean stop and search rates for law enforcement agencies in North Carolina and could include a range of explanatory variables such as population, crime, calls-for-service, motor vehicle crashes and other key factors. All analyses should distinguish stops made by patrol officers from those made by specialized traffic units, interdiction units, or other specialized teams.

To the extent practicable, analysis of traffic stops should relate to sub-areas within a single jurisdictions, following the technique used by Smith, Davison, Zingraff, Rice, & Bissler (2004) and recommended by Fridell (2005) and many other researchers. In addition to racial and ethnic distribution, explanatory variables such as crime, calls for police service by type, deployment, and crashes should be included as well as key socioeconomic factors – unemployment, median household income and economic disadvantage. Further, some researchers have advanced a low-cost method to detect racial or ethnic bias in traffic stops by examining the proportion of minorities stopped within a single jurisdiction during daylight v. nighttime. Guidelines for meaningful analysis have been established by Grogger and Ridgeway (2006), Ridgeway (2009), Worden, McLean, & Wheeler (2012) and Ritter and Bael (2009).

Meaningful analysis should be consistent with best practices:

- Exclude stops arising from warrants
- Distinguish searches incident to arrest and probable cause – low discretion searches – from high discretion consent searches
- Calculate contraband seized based on the number of unique stops
- Exclude searched passengers from analysis

There are other promising avenues for analysis of traffic stop data. It seems promising to analyze a sample of police stop videos, as researchers did in Cincinnati (Dixon, Schell, Giles, & Drogos, 2008) to examine the nature of interaction between police and citizens. Such analysis is used to examine factors such as the length of the stop, the quality of communication between officer and citizen, the presence of other officers on the scene, the number of passengers, and other factors that may shed light on police citizen-interaction and offer opportunities for improving relationships. In Cincinnati and other locations, the use of cameras to document and

examine evidence of racial or ethnic bias has been encouraged by both law enforcement and interest groups such as the ACLU.

Numerous authors have pointed out that analysis of traffic stop, search and seizure data is not a simple task and answers to key questions – even findings of racial disparity – do not demonstrate that that officers – or their agencies – are biased (Fridell, 2004; Engel, 2008; Smith, et al., 2003). Just as importantly, however, findings of no racial disparity in stops, searches and seizures do not demonstrate that police are not biased. Instead of seeking simplistic interpretations of data, researchers recommend that findings should be viewed as a tool to guide communities and law enforcement agencies in selecting the appropriate procedures to address priority problems.

> "It is now widely accepted in the social scientific communities that stop and search rates alone should only be used to determine if there are racial/ethnic disparities but not racial discrimination, animus, or bias" (Engel, 2008, p. 8).

Overall, the limitations in traffic stop data discussed in this report have implications for analysis and findings of racial or ethnic bias by law enforcement in North Carolina. A review is critical and revisions are appropriate.

It would be a mistake to think that law enforcement agencies have done nothing to respond to perceptions of racial bias. Most law enforcement executives are concerned about citizen perceptions of police and their views of police legitimacy regardless of findings in empirical data. In addition to documenting the type and nature of traffic stops, law enforcement agencies have voluntarily undertaken numerous initiatives to address citizen perceptions, and to monitor for possible bias within their agencies.

Recommendations for Improving TSR Data Quality

1. Requirements for initial stop purpose should be reviewed – DUI should be dropped, investigations clarified and other examined. Checkpoints should either include all drivers or be excluded from stops.

2. The severity of the offense for which the driver was initially stopped should be documented; for example, the officer should document both the recorded speed and the posted speed.

3. Document location of stop. Traffic stop reports should include a place variable – roadway, intersection, or other marker; when occurring within a municipality, this data should include the 100-block or nearest intersection.

4. Revisit documentation of race/ethnicity classification. The vast majority of data collection systems in the U.S. require officers to determine either the race or ethnicity of the driver – but not both. We recommend combining race and ethnicity into a single racial/ethnicity indicator for drivers – as recommended by Northeastern University (Ramirez, McDevitt, & Farrell, 2000; Fridell, 2005).

5. Document home jurisdiction (city and county) of all drivers stopped.

6. Eliminate documentation of sex, age, race and ethnicity of searched passengers.

7. Specify the arrest charge (highest charge if multiple) arising from stop and factors that lead to the arrest such as outstanding warrant.

8. Document requests for consent searches and record if the request was declined.

9. Eliminate documentation of basis for searches, particularly consent searches.

10. Citations, arrests and searches arising at checkpoints should not be documented.

11. Audit law enforcement agencies reporting data to ensure it is submitted and audit data to ensure accuracy.

12. Audit Traffic Stop Reports for accuracy and analyze data to shed light on variations between and within jurisdictions.

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Appendix

Table 21: Traffic Stops Reported by Agency, 2000-2011

		Frequency	Percent
1	NC State Highway Patrol	6,212,506	46.9
2	Charlotte-Mecklenburg Police Department	1,015,300	7.7
3	Raleigh Police Department	547,436	4.1
4	Greensboro Police Department	370,706	2.8
5	Winston-Salem Police Department	291,440	2.2
6	Fayetteville Police Department	226,464	1.7
7	High Point Police Department	186,668	1.4
8	Durham Police Department	165,660	1.3
9	NC Division of Motor Vehicles, License and Theft	133,843	1.0
10	Jacksonville Police Department	120,237	.9
11	Cary Police Department	118,035	.9
12	Wilmington Police Department	109,653	.8
13	Concord Police Department	108,057	.8
14	SHP - Motor Carrier Enforcement Section	104,772	.8
15	Wake County Sheriff's Office	91,124	.7
16	Greenville Police Department	78,409	.6
17	Forsyth County Sheriff's Office	78,178	.6
18	Matthews Police Department	75,694	.6
19	Goldsboro Police Department	72,587	.5
20	Gaston County Police Department	71,388	.5
21	Asheville Police Department	71,379	.5
22	Kannapolis Police Department	71,251	.5
23	Apex Police Department	65,270	.5
24	Hickory Police Department	63,619	.5
25	Gastonia Police Department	59,443	.4
26	Burlington Police Department	59,229	.4
27	Monroe Police Department	55,428	.4
28	Lexington Police Department	54,951	.4
29	Guilford County Sheriff's Office	53,316	.4
30	Mooresville Police Department	52,947	.4
31	Garner Police Department	50,018	.4
32	Huntersville Police Department	49,030	.4
33	Chapel Hill Police Department	47,366	.4
34	New Bern Police Department	45,801	.3
35	Asheboro Police Department	45,769	.3
36	Morganton Police Department	43,234	.3
37	Cumberland County Sheriff's Office	43,190	.3
38	Statesville Police Department	42,811	.3
39	Wilson Police Department	41,556	.3
40	Kernersville Police Department	40,266	.3
41	Wake Forest Police Department	40,136	.3

42	UNC Greensboro University Police Department	38,508	.3
43	Rocky Mount Police Department	38,346	.3
44	Durham County Sheriff's Office	35,193	.3
45	Roanoke Rapids Police Department	33,043	.2
46	Elizabeth City Police Department	31,587	.2
47	Sanford Police Department	31,105	.2
48	Currituck County Sheriff's Office	30,940	.2
49	Kinston Police Department	30,079	.2
50	Eden Police Department	29,511	.2
51	Tarboro Police Department	28,353	.2
52	Shelby Police Department	28,179	.2
53	Salisbury Police Department	28,114	.2
54	Henderson Police Department	27,569	.2
55	Iredell County Sheriff's Office	27,479	.2
56	Dare County Sheriff's Office	27,305	.2
57	Aberdeen Police Department	26,754	.2
58	Pineville Police Department	26,736	.2
59	Lumberton Police Department	26,682	.2
60	Kings Mountain Police Department	26,434	.2
61	Davidson County Sheriff's Office	25,443	.2
62	Southern Pines Police Department	25,110	.2
63	Carrboro Police Department	23,483	.2
64	Smithfield Police Department	23,348	.2
65	Cornelius Police Department	23,112	.2
66	Cabarrus County Sheriff's Office	21,814	.2
67	Albemarle Police Department	21,494	.2
68	Lenoir Police Department	21,328	.2
69	Kitty Hawk Police Department	21,054	.2
70	Nags Head Police Department	20,758	.2
71	Thomasville Police Department	20,423	.2
72	UNC Charlotte University Police Department	20,080	.2
73	UNC Chapel Hill University Police Department	19,791	.1
74	East Carolina University Police Department	19,788	.1
75	Henderson County Sheriff's Office	19,587	.1
76	Union County Sheriff's Office	19,567	.1
77	Holly Springs Police Department	19,412	.1
78	Morrisville Police Department	18,758	.1
79	Pinehurst Police Department	18,203	.1
80	Rowan County Sheriff's Office	18,168	.1
81	Chatham County Sheriff's Office	18,111	.1
82	Fuquay-Varina Police Department	17,882	.1
83	Mint Hill Police Department	17,453	.1
84	Havelock Police Department	17,432	.1

85	NC State University Police Department	17,234	.1
86	Wrightsville Beach Police Department	17,177	.1
87	Buncombe County Sheriff's Office	16,885	.1
88	Reidsville Police Department	16,359	.1
89	Lincoln County Sheriff's Office	16,209	.1
90	Hendersonville Police Department	15,816	.1
91	Graham Police Department	15,635	.1
92	Newton Police Department	15,606	.1
93	Johnston County Sheriff's Office	15,252	.1
94	Clayton Police Department	14,170	.1
95	Wilson County Sheriff's Office	14,017	.1
96	NC A&T University Police Department	13,784	.1
97	Leland Police Department	13,579	.1
98	Hope Mills Police Department	13,475	.1
99	Wilkesboro Police Department	12,673	.1
100	Halifax County Sheriff's Office	12,459	.1
101	New Hanover County Sheriff's Office	12,151	.1
102	Nash County Sheriff's Office	12,070	.1
103	Orange County Sheriff's Office	11,820	.1
104	Appalachian State University Police Department	11,621	.1
105	Robeson County Sheriff's Office	11,503	.1
106	UNC Wilmington Police Department	11,217	.1
107	Hoke County Sheriff's Office	10,811	.1
108	Butner Public Safety	10,589	.1
109	Claremont Police Department	10,412	.1
110	Brunswick County Sheriff's Office	10,366	.1
111	Pender County Sheriff's Office	10,318	.1
112	Blowing Rock Police Department	10,187	.1
113	Lincolnton Police Department	10,096	.1
114	Randolph County Sheriff's Office	9,744	.1
115	Youngsville Police Department	8,891	.1
116	Archdale Police Department	8,798	.1
117	Burke County Sheriff's Office	8,788	.1
118	Alamance County Sheriff's Office	8,780	.1
119	State Capitol Police	8,764	.1
120	Cleveland County Sheriff's Office	8,652	.1
121	Davie County Sheriff's Office	8,477	.1
122	NC State Parks	8,373	.1
123	Lake Lure Police Department	8,296	.1
124	Stallings Police Department	8,072	.1
125	Harnett County Sheriff's Office	8,050	.1
126	Onslow County Sheriff's Office	7,670	.1
127	North Topsail Beach Police Department	7,555	.1

128	Surf City Police Department	7,544	.1
129	Weldon Police Department	7,380	.1
130	Sampson County Sheriff's Office	6,910	.1
131	Camden County Sheriff's Office	6,904	.1
132	Moore County Sheriff's Office	6,902	.1
133	Rockingham County Sheriff's Office	6,891	.1
134	Wayne County Sheriff's Office	6,882	.1
135	Pitt County Sheriff's Office	6,864	.1
136	Catawba County Sheriff's Office	6,708	.1
137	Rolesville Police Department	6,656	.1
138	Jonesville Police Department	6,603	.0
139	Dunn Police Department	6,509	.0
140	Murphy Police Department	6,462	.0
141	Stokes County Sheriff's Office	6,158	.0
142	Mount Holly Police Department	6,069	.0
143	Western Carolina University Police Department	5,916	.0
144	Old Fort Police Department	5,844	.0
145	Atlantic Beach Police Department	5,786	.0
146	Caldwell County Sheriff's Office	5,746	.0
147	Holly Ridge Police Department	5,553	.0
148	NC Alcohol Law Enforcement	5,553	.0
149	Rutherford County Sheriff's Office	5,507	.0
150	Wadesboro Police Department	5,492	.0
151	Carolina Beach Police Department	5,338	.0
152	Mount Airy Police Department	5,114	.0
153	Lee County Sheriff's Office	4,878	.0
154	Pasquotank County Sheriff's Office	4,806	.0
155	Beaufort County Sheriff's Office	4,340	.0
156	Yadkin County Sheriff's Office	4,290	.0
157	Saint Pauls Police Department	4,283	.0
158	Hertford County Sheriff's Office	4,245	.0
159	Taylorsville Police Department	4,237	.0
160	Troutman Police Department	4,227	.0
161	Shallotte Police Department	4,138	.0
162	Rowland Police Department	4,130	.0
163	Conover Police Department	4,041	.0
164	Surry County Sheriff's Office	4,010	.0
165	Haywood County Sheriff's Office	3,956	.0
166	Duplin County Sheriff's Office	3,919	.0
167	Alexander County Sheriff's Office	3,904	.0
168	Tyrrell County Sheriff's Office	3,883	.0
169	Fairmont Department of Public Safety	3,880	.0
170	North Wilkesboro Police Department	3,779	.0

171	Laurinburg Police Department	3,596	.0
172	Beech Mountain Police Department	3,572	.0
173	Ocean Isle Beach Police Department	3,553	.0
174	Transylvania County Sheriff's Office	3,480	.0
175	Manteo Police Department	3,461	.0
176	Madison Police Department	3,427	.0
177	Columbus County Sheriff's Office	3,190	.0
178	Warren County Sheriff's Office	3,081	.0
179	Fletcher Police Department	3,051	.0
180	Stanly County Sheriff's Office	3,018	.0
181	Creedmoor Police Department	3,006	.0
182	Pembroke Police Department	2,987	.0
183	White Lake Police Department	2,946	.0
184	Mecklenburg County Sheriff's Office	2,800	.0
185	Topsail Beach Police Department	2,788	.0
186	Cherokee County Sheriff's Office	2,766	.0
187	Watauga County Sheriff's Office	2,719	.0
188	Zebulon Police Department	2,702	.0
189	Pilot Mountain Police Department	2,656	.0
190	Person County Sheriff's Office	2,570	.0
191	Lenoir County Sheriff's Office	2,540	.0
192	Caswell County Sheriff's Office	2,524	.0
193	Montgomery County Sheriff's Office	2,501	.0
194	NC Central University Police Department	2,440	.0
195	Maggie Valley Police Department	2,371	.0
196	Polk County Sheriff's Office	2,325	.0
197	Macon County Sheriff's Office	2,304	.0
198	Murfreesboro Police Department	2,280	.0
199	Craven County Sheriff's Office	2,229	.0
200	McDowell County Sheriff's Office	2,175	.0
201	Avery County Sheriff's Office	2,170	.0
202	Granville County Sheriff's Office	2,158	.0
203	Vance County Sheriff's Office	2,103	.0
204	Washington County Sheriff's Office	1,955	.0
205	Fayetteville State University Police Department	1,948	.0
206	Candor Police Department	1,898	.0
207	Newland Police Department	1,876	.0
208	UNC Asheville University Police Department	1,736	.0
209	Banner Elk Police Department	1,687	.0
210	Martin County Sheriff's Office	1,636	.0
211	Middlesex Police Department	1,483	.0
212	Village of Misenheimer Police Department	1,483	.0
213	Sugar Mountain Police Department	1,431	.0

214	Greene County Sheriff's Office	1,412	.0
215	Edgecombe County Sheriff's Office	1,396	.0
216	Holden Beach Police Department	1,388	.0
217	Scotland County Sheriff's Office	1,326	.0
218	Sylva Police Department	1,322	.0
219	Cleveland Police Department	1,294	.0
220	Bladen County Sheriff's Office	1,264	.0
221	Duck Police Department	1,233	.0
222	Guilford Technical Community College	1,225	.0
223	Chowan County Sheriff's Office	1,213	.0
224	Biltmore Forest Police Department	1,175	.0
225	Spring Lake Police Department	1,097	.0
226	Broughton Hospital Police Department	1,074	.0
227	Jones County Sheriff's Office	1,061	.0
228	Pittsboro Police Department	1,051	.0
229	West Jefferson Police Department	1,051	.0
230	Washington Police Department	1,035	.0
231	Franklin County Sheriff's Office	1,030	.0
232	Gaston County Sheriff's Office	996	.0
233	Gates County Sheriff's Office	980	.0
234	Robbins Police Department	969	.0
235	Bald Head Island Police Department	934	.0
236	Elizabeth City State University Police Department	934	.0
237	Richlands Police Department	898	.0
238	Stantonsburg Police Department	897	.0
239	Parkton Police Department	854	.0
240	UNC School of the Arts Police Department	850	.0
241	Swain County Sheriff's Office	836	.0
242	Hyde County Sheriff's Office	835	.0
243	Pamlico County Sheriff's Office	828	.0
244	Vass Police Department	786	.0
245	NC Arboretum Campus Police	765	.0
246	Columbus Police Department	752	.0
247	Sunset Beach Police Department	731	.0
248	Cherry O'Berry Hospital Police Department	720	.0
249	Highlands Police Department	710	.0
250	UNC Pembroke University Police Department	696	.0
251	Madison County Sheriff's Office	678	.0
252	Northampton County Sheriff's Office	672	.0
253	Kure Beach Police Department	667	.0
254	Anson County Sheriff's Office	663	.0
255	Stoneville Police Department	613	.0
256	Pine Knoll Shores Police Department	594	.0

257	Carteret County Sheriff's Office	587	.0
258	Richmond County Sheriff's Office	585	.0
259	Littleton Police Department	577	.0
260	Kenly Police Department	570	.0
261	Mitchell County Sheriff's Office	565	.0
262	Clay County Sheriff's Office	506	.0
263	Davidson Police Department	506	.0
264	Biscoe Police Department	427	.0
265	Bunn Police Department	419	.0
266	Montreat Police Department	399	.0
267	Walnut Creek Police Department	399	.0
268	Indian Beach Police Department	390	.0
269	NC Wildlife Enforcement	389	.0
270	Pinetops Police Department	366	.0
271	Atkinson Police Department	328	.0
272	Warrenton Police Department	317	.0
273	Winston-Salem State University Police Department	316	.0
274	Saluda Police Department	311	.0
275	NC Division of Marine Fisheries Police Department	301	.0
276	Jackson County Sheriff's Office	270	.0
277	Alleghany County Sheriff's Office	263	.0
278	Bertie County Sheriff's Office	257	.0
279	Perquimans County Sheriff's Office	242	.0
280	NC State Bureau of Investigation	241	.0
281	McAdenville Police Department	179	.0
282	Caswell Center Hospital Police Department	165	.0
283	Foxfire Village Police Department	143	.0
284	Wilkes County Sheriff's Office	126	.0
285	DHHS Police - Black Mountain	124	.0
286	Brunswick Community College	122	.0
287	Star Police Department	118	.0
288	Ashe County Sheriff's Office	114	.0
289	Caswell Beach Police Department	112	.0
290	Spruce Pine Police Department	108	.0
291	Mayodan Police Department	105	.0
292	Norlina Police Department	66	.0
293	Marshall Police Department	63	.0
294	Elk Park Police Department	50	.0
295	Yancey County Sheriff's Office	35	.0
296	Cameron Police Department	24	.0
297	NC State Fairgrounds Police Department	2	.0
	Total	**13,233,635**	**100.0**

Deborah Lamm Weisel, Ph.D.

Deborah Lamm Weisel has more than 20 years of experience working with law enforcement agencies across the United States on issues addressing police integrity and effectiveness. She is an expert on community policing and problem solving in minority communities and has conducted extensive studies of police responses to drug and gang problems in major cities. Weisel has been principal investigator of five national studies funded by the National Institute of Justice, and is currently the research partner for the SMART Policing Initiative funded by the Bureau of Justice Assistance in the Chula Vista, CA, Police Department.

Weisel holds a doctorate in public policy from the University of Illinois at Chicago. She worked as a senior research associate for the Police Executive Research Forum from 1987-1999, and was on the faculty of N.C. State University from 1999-2011 where she continues to teach in the university's highly regarded Administrative Officers Management Program (AOMP). She joined the faculty of NC Central University's Department of Criminal Justice in 2011.

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