

Benchmarking Portland Police Bureau Traffic Stop and Search Data

Technical Assistance Report

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EXECUTIVE SUMMARY

National efforts to collect data on the racial/ethnic characteristics of drivers in police traffic stops has been promoted as an important tool for addressing public perceptions over the existence of biased policing. However, efforts to collect data have outpaced the development of best practices for accurately and objectively analyzing and interpreting trends in police traffic stops and searches. Over time national research experts have concluded that determining police bias through traffic stop data collection is complicated and clear answers are difficult to achieve, more so than both police and community members had originally anticipated (McDevitt, 2009).

The difficulty in assessing the presence of racial bias in traffic stops is developing a reasonable expected rate at which any racial/ethnic group would be stopped or searched after the stop (Schell, et al., 2007). This difficulty is known as the benchmarking problem. The Portland Police Bureau (PPB) has asked for technical assistance from Oregon's Law Enforcement Contacts Policy and Data Review Committee (LECC) through the services of the Criminal Justice Policy Research Institute at Portland State University to help the Bureau explore the benchmarking problem and offer suggestions regarding traffic stop data collection, data analysis, and policy.

The report contains three sections.

- An overview of the "benching marking problem".
- A review of different benchmarking options, including illustrations of benchmarks with PPB data if available, and the limitations of the different methods.
- Recommendations to PPB regarding future data collection, analysis, reporting, and policy.

The data used to illustrate some of the benchmarking approaches come from all stops recorded by the Portland Police Bureau (PPB) from 1/01/04 through 6/30/08. For some of the analyses additional data from the following sources was utilized: 1) 2000 and 2005 Portland Census demographics at the city (2005), precinct (2005), and neighborhood level (2000). 2) Total violent crimes 2002-2006 by neighborhood from the PPB website. 3) All citizen-initiated calls for police service and the neighborhood of origin for the call from 2004-2008.

Highlights of Key Recommendations, Findings, and Conclusions

- ✓ The Bureau should ensure that there remains an easy link between the stop information data system and the CAD data system (i.e. a unique matching ID in both systems). The CAD data system provides critical contextual information

about the stop that is needed to properly test alternative benchmark methods. Without the CAD data more accurate benchmarking and contextual information regarding the stop is lost.

- ✓ Key additional data points the bureau should consider collecting are the following:
 - More detailed information on the reason for the stop. In particular, the severity and type of traffic violation (Fridell, 2004). Being able to distinguish “pretext-type” stops should be a key goal.
 - More detailed coding of discretionary searches including consent, plain view, probable cause, and weapon pat down.
 - Number of passengers.
 - Vehicle registration (in state vs. out of state)
 - Driver residency (Portland resident, non-Portland resident)
- ✓ Census population benchmarking should not be the exclusive benchmark utilized. It can provide an important start to examining traffic stop data, but must be followed by additional benchmark methods that can address limitations regarding differential driving behavior and exposure to law enforcement.
- ✓ Since each benchmarking strategy has its own limitations looking at the issue of possible police bias in stops and searches from multiple analytic perspectives is critical.
- ✓ The results of analyses using preferred benchmarks like examining daytime versus nighttime stops, traffic unit versus regular patrol stops, and multivariate analysis of search decision-making reduces the likelihood that systemic bias is a contributing factor to stop or search disparities in the Portland Police Bureau. These benchmarking approaches should be continued in the future.
- ✓ Some of the disparity in traffic stops between African American and White motorists appears to be due to differential exposure to law enforcement. The analyses suggest that African American drivers are at greater risks for being stopped because they are more likely to reside in neighborhoods where crime and police activity is dramatically increased, thus weakening the likelihood that police bias is a contributing factor to stop or search disparities. The Bureau needs to continue to have an open dialogue with neighborhoods that receive more proactive police patrol in order to explain the motivations and intent behind their presence and illustrate the potential successes in preventing and controlling crime.

Benchmarking Portland Police Bureau Traffic Stop and Search Data

INTRODUCTION

The Portland Police Bureau (PPB) initiated traffic stop data collection in 2001. PPB has internally analyzed their traffic stop data and released statistical reports to the public through their website in 2002 (using 2001 traffic stops), 2005 (2004 traffic stops), 2006 (2005 traffic stops), 2007 (2006 traffic stops), and 2008 (2007 traffic stops). In addition, Dr. Brian Withrow on behalf of the Portland Police Association analyzed the 2006 traffic stop data and submitted a report to the Bureau. The Bureau's willingness to engage in long-term traffic stop data collection and conduct both internal and external analyses of their data should be acknowledged.

The Bureau has asked for technical assistance from Oregon's Law Enforcement Contacts Policy and Data Review Committee (LECC) through the services of the Criminal Justice Policy Research Institute at Portland State University to help the Bureau explore the following key issues: 1) Given the known problems with using population as a baseline to assess racial/ethnic disparities and potential bias in traffic stops, are there more valid approaches? 2) Going forward, what changes should the Bureau make to the collection, analysis, and reporting of traffic stop data?

This report addresses these issues in three sections. First, a review of what others have called the "benching marking problem" is undertaken. In order to judge whether patterns in traffic stop and search data imply the possibility of racial bias, any analysis requires some type of expected value or trend for comparison (i.e. benchmark) in order to assess if data trends are "normal" or "abnormal". Our review leads us to the conclusion that *the best benchmarking approach is to apply multiple benchmarks to assess potential police biases*. Given this conclusion, the second section provides a review of different benchmarking options. Even though we cannot illustrate each of these benchmark options with PPB data, because in some cases the data does not exist, we feel it is important to discuss these alternative approaches in order to properly weigh the best future direction for stop data collection and analysis. Our review of benchmark options details each approach, how it is done, what results from the benchmark with PPB data if available, and the limitations of the method. The third section offers recommendations to PPB regarding future data collection, analysis, reporting, and policy.

THE BENCHMARKING PROBLEM

National efforts in traffic stop data collection to understand racial and ethnic disparities has outpaced quality research that can determine the most appropriate means for analyzing and interpreting trends in stops and searches. The difficulty in assessing the presence of racial bias in traffic stops is developing a reasonable expected rate at which

any racial/ethnic group would be stopped or searched after the stop (Schell, et al., 2007). This difficulty is known as the benchmarking problem. The basic benchmarking hypothesis starts with determining whether a racial/ethnic group is stopped or searched more often than what is the “expected rate”. If there is disparity from the expected rate some form of police bias may be responsible. Police bias refers to minority drivers being stopped or searched more often because officers are actively seeking minority drivers for stops and searches, or when observing a traffic infraction more likely to stop the vehicle if the driver is black (Schell et al., 2007).¹ The ideal benchmarking approach would be utilized over time to examine progress towards the expected rate. Such simple logic; however, has a number of limitations. Determining an appropriate expected rate is complex because there may be legitimate reasons for a racial/ethnic group to differ from any expected rate.

There are three important factors that must be considered when evaluating the utility of any benchmarking strategy in determining the possibility of biased policing. The extent to which alternative factors or explanations of disparity can be proven reduces the likelihood that police bias is a contributing factor to stop or search disparities. First, a quality benchmark approach should be able to rule out that driving behavior might vary by race/ethnicity (Schell, et al., 2007). Minority drivers may be stopped more often because they may be more likely to commit some kind of traffic infraction. This may include expired license plates, speeding, or mechanical violations. Some studies have shown differences by race in speeding (Lange, Blackmi, and Johnson, 2002) and seatbelt use (Hallmark, Mueller, and Veneziano, 2004). Others have shown that almost all drivers have some vehicle code violation while driving (Lamberth, 2003). There could also be important after-stop behavioral cues that vary by race/ethnicity that increase search likelihood. For example, if minority drivers are more likely than white drivers to be stopped for serious traffic infractions, act antagonistic or hostile, be stopped at night, or drive with passengers their traffic stops are more likely to be viewed with suspicion leading to searches.

Second, a benchmark approach should be able to rule out whether exposure to law enforcement might vary by race (Schell, et al., 2007). Minority drivers may be stopped more often because they are more likely to be exposed to law enforcement. They may drive more often or, more likely, in regions with greater police presence, so that any infraction they make would be more likely to be noticed. Neighborhood variation in crime and calls for service may be used as justification for more proactive crime interdiction and search strategies to find drugs and guns when probable cause is present. Neighborhood crime trends may increase overall suspicion among officers working those areas. If minority stops and driving population is centered in higher crime and calls for service neighborhoods it could increase the likelihood of minority search experiences.

¹ This definition of biased policing comes from Schell et al. (2007, p. 26). An alternative definition and preferred definition is offered by Fridell, Diamond, & Kubu (2001, p. 5), “Racially biased policing occurs when law enforcement inappropriately considers race or ethnicity in deciding with whom and how to intervene in an enforcement capacity.”

Third, a quality benchmarking strategy should be able to rule out whether disparity is the product of large numbers of officers who stop and search minorities at much higher rates than the norm or whether a few officers exhibit extraordinary stop and search rates of minorities. This approach is called an internal benchmarking strategy. An internal benchmarking strategy is important to consider because examinations of aggregate stop and search data may in fact be the product of both over-enforcement of minority persons and also under-enforcement, known as “de-policing”. The effects of over-enforcement and de-policing by some officers may cancel each other out and create department-wide statistics that look normal, but the biases of some individual officers would be hidden.

In sum, *the best benchmarking strategy is to apply multiple benchmarking approaches* as recommended by Lovrich et al.’s (2007) examination of Washington State Trooper data and Schell et al.’s (2007) examination of the Cincinnati PD data. Since each benchmarking strategy has its own limitations looking at the issue of possible police bias in stops and searches from multiple analytic perspectives is critical. Choosing benchmarking approaches that consider or have the capacity to rule out other possible explanations of disparity is also necessary.

The remainder of this report provides a review of different benchmarking strategies being utilized in analysis of traffic and search data. The methodology of each strategy is described, an illustration of the approach with PPB data is presented (if data is available), and the limitations of each approach are noted. We recommend that the PPB apply multiple benchmarking strategies in the future and ensure their data collection system is able to accurately provide the proper data for each approach.

DATA SOURCES

The data used to illustrate some of the benchmarking approaches come from all stops recorded by the Portland Police Bureau (PPB) from 1/01/04 through 6/30/08. These stops were linked with BOEC CAD data which provides additional information on the context of the stop (e.g. time, location, patrol unit). The analysis for this report includes only traffic stops which comprise 81% of all stops recorded by PPB (N = 361,389). An additional 39,157 stops (10.8%) are excluded from the analysis because they were non-compliant. More detailed analyses of searches and stops made only by regular patrol units reduced the total stops analyzed further for those distinct analyses. For some of the analyses additional data from the following sources was utilized: 1) 2000 and 2005 Portland Census demographics at the city (2005), precinct (2005), and neighborhood level (2000). 2) Total violent crimes 2002-2006 by neighborhood from the PPB website. 3) All citizen-initiated calls for police service and the neighborhood of origin for the call from 2004-2008.

BENCHMARKING STRATEGIES

Benchmarking Option # 1: Census Population Comparisons

Description and Expected Rate: The most common and controversial of benchmarking strategies, because of its many limitations, is census population benchmarking. Census population benchmarking is common because it entails the most readily available data. However, the basic census comparison analysis cannot rule out stop rate differences due to racial/ethnic differences in driving behavior and differential exposure to law enforcement. Schell et al. (2007, p. 26) in their examination of the Cincinnati Police Department's stop data note that race/ethnic differences in stops compared to their population percentage, "say little, if anything, about unequal treatment." Despite its limitations, census population benchmarking can be a good start to looking at stop data, but should not be used as an exclusive benchmark. For example, recent evaluations of Cincinnati PD and Washington State Troopers begin their analysis by briefly reviewing the census comparison data, but the bulk of these evaluations focus on more rigorous or improved benchmarking approaches. The logic of census population benchmarking is that all racial and ethnic groups are expected to be stopped at rates equal to their percentage in the population. In other words, if African Americans comprise 6% of the population, they should comprise 6% of all traffic stops. Disparity occurs when the racial/ethnic proportion of stops exceeds their population percentage. If population disparity exists, determining whether it is large or small is the next important step. Lovrich, et al. (2007, p. 5) adopt a criterion used in several other studies promoted by McMahon, et al. (2002) that differences are not substantively significant as long as the percentage of those contacted in any particular racial group is not more than five percentage points greater than the percentage of the group in the benchmark comparison.

Methodology: Census data is used to determine racial/ethnic proportions of the population you want to examine. Analysts agree that the census population should be as close to the "driving age" population or those who are more at risk for being stopped because they can drive. Population aged 16 and older by race/ethnicity is the common standard baseline. The next step entails comparing the population aged 16 and older to the proportion of traffic stops broken out by race to assess the degree to which the racial/ethnic proportions are over or under the benchmark. Different statistics are also used to examine racial/ethnic comparisons: a) absolute difference = difference between stop % and population %, b) relative difference = $\text{stop \%} - \text{population \%} / \text{population \%} \times 100$, c) stop rate per 1,000 = the likelihood of being pulled over for that race d) white rate ratio = the difference between the likelihood of whites being pulled over per 1000 compared to each race.

PPB Illustration: Table 1 in Appendix A shows an analysis of PPB traffic stop data using a census population comparison. The data indicate African American and Hispanic motorists are more likely to be stopped compared to White motorists when using their proportion of the population aged 16 and older as a comparator. African American drivers are the only racial/ethnic grouping that reaches the 5% over expected criterion in

Portland (Lovrich et al., 2007). African American drivers comprise 14.6% of traffic stops and 6% of the population aged 16 and older. Hispanic drivers comprise 9.4% of traffic stops and 7.6% of the population aged 16 and older. Asian drivers comprise 4.4% of traffic stops and 5.7% of the population aged 16 and older. Native American drivers comprise 0.3% of traffic stops and 1.1% of the population aged 16 and older. Recall that census benchmarking has the most limitations of any benchmarking method and should not be used as the only benchmarking approach.

Limitations:

- May not be a good indicator of driving prevalence/frequency by race/ethnicity and cannot rule out differences in traffic law violations by race/ethnicity.
- Unable to rule out differential exposure to law enforcement as a source of disparity.
- Unable to assess internal differences in individual officer's rates of making stops.
- Usually cannot control for out of town drivers traveling through city and being stopped.
- Racial/ethnic distributions within a city may change rapidly over time and not be properly reflected in decennial census data. A disparity index can also be misleadingly high when a minority group is in low proportions in the stop and population benchmark.

Benchmarking Option # 2: Daytime versus Nighttime Stops

Description and Expected Rate: It is generally accepted that the ability of officers to see the race/ethnicity of drivers and passengers is diminished in the nighttime, thus it would be difficult to make traffic stops at night based exclusively on the race/ethnicity of the driver (Grogger & Ridgeway, 2006). Analysts like Grogger and Ridgeway (2006) recommend exploring changes in the racial/ethnic proportions of traffic stops during the day versus nighttime to assess bias. If bias is absent from stop decision-making, we expect the percentage of African American drivers among drivers stopped during daylight to be equal or less than the percentage of African American drivers among those stopped in darkness (Schell et al., 2007, p. 22). When this benchmark is tracked over time significant increases in daylight stops of minorities would be a signal for further investigation and potential concern.

If a greater proportion of minority driver stops occur at night it may be an indication that racial/ethnic disparities in traffic stops are more related to differences in patrol practices and deployment strategies than conscious or unconscious biases. For example, officers' suspicion and proactive enforcement may be heightened at night, particularly if patrol is intensified in communities with higher crime and calls for service that tend to peak in the evening shifts. Neighborhoods where police patrol is intensified in the evenings may be areas with a higher proportion of racial/ethnic groups living or traveling through. Alternatively, it is possible there are important differences in daytime and evening driving patterns and locations across race/ethnicity that may place some groups of drivers at more risk for being stopped. Grogger and Ridgeway (2006)

contend that an intertwilight analysis during the 30 days surrounding daylight savings addresses these concerns.

Methodology: Data collection must include the date and time of the stop. Time and day information for each stop can then be matched to records for the daily sunrise and sunset times provided by the U.S. Navy Observatory for your locale of interest (<http://www.usno.navy.mil/USNO/astronomical-applications/data-services/rs-one-year-us>). The percentage of stops that occurred at nighttime by race/ethnicity is then compared to the percentage of stops by race/ethnicity that occurred in the daytime. Grogger and Ridgeway (2006) advocate a much more complex approach to this analysis that has been applied in the Schell, et al. (2007) analysis of Cincinnati PD stops. Their approach utilizes a very small percentage of stops that occur within the 30 days before and after daylight savings switches in the fall and spring and during what they call the “intertwilight” hours of 5:50pm to 7:39pm. They propose this method holds constant differential exposure to law enforcement and differential driving behaviors; the only difference before and after daylight savings during the twilight timeframe is whether it is light or dark out. If the proportion of racial/ethnic minority stops is greater when it is daylight this may be an indication of racial bias.

PPB Illustration: Table 2 in Appendix A shows an analysis of daytime compared to nighttime Portland Police traffic stops from 2004 to 2008. All racial/ethnic groups show close to a 50% increase in traffic stops at night (i.e. the sun has set). Between 2004 and 2008 there were 77,455 more traffic stops conducted at night than daytime; or 15,491 more per year. The proportion of traffic stops involving African American drivers increases in the nighttime hours from 10.3% of all traffic stops to 17.2%, this trend weakens the argument that there is department-wide police bias in making stops. The proportion of traffic stops that involve Hispanic drivers remains the same during the day and night, but Hispanic stops do increase in the nighttime. This result also weakens the argument of systemic department biases. The proportion of traffic stops involving White drivers decreases at night, but the overall number of stops increases at night too.

Since it is difficult to determine the race/ethnicity of a driver at nighttime, these findings lessen the probability that racial/ethnic differences in Portland traffic stops are related to conscious or unconscious biases. The increase in traffic stops at night, particularly for African American drivers, appears to be the result of intensified patrol and deployment strategies. These strategies are likely focused in certain locations where African Americans are more likely to reside or drive through during evening hours placing them at more risk for being stopped.

Limitations:

- Unable to rule out differential exposure to law enforcement as a source of bias.
- Unable to assess internal differences in individual officer’s rates of making stops

Benchmarking Option # 3: Traffic Unit Stops versus Regular Patrol Stops

Description and Expected Rate: The examination of stops by the traffic unit provides an alternative benchmark or “blind” type of benchmark similar to the examination of nighttime stops. For example, Lovrich et al. (2007) examine the racial/ethnic proportions of drivers who have been contacted as a result of being identified as speeding via radar to see if the proportions are similar to all other stops. They note this particular benchmark, “constitutes a measure of *both* driving quantity and driving quality, and has the important additional advantage of being a “blind” count – that is to say, WSP Troopers operating radar units seldom if ever can determine the race of motorists identified as speeders by this traffic safety enforcement technique (Lovrich et al, 2007, p. 9).”

It is common for traffic units to be relieved of 911 responsibilities to focus on traffic infractions by setting up radar or other traffic check-points. We expect that the racial/ethnic proportions of drivers stopped by traffic units are a more accurate measure of driving frequency and violations of traffic laws across race/ethnicity because traffic units use techniques that are less susceptible to any biases (e.g. radar enforcement). If the proportion of persons stopped by regular patrol units is similar to the proportion stopped by traffic units (i.e. a 5% difference criterion) then evidence of biased enforcement by the regular patrol units is weak. One concern with this baseline approach is that it is more commonly used in studies of highway patrol, which is primarily traffic enforcement focused. Comparing traffic units to regular patrol units in a large urban city may be like comparing apples and oranges. Regular patrol units are more likely to use patrol strategies that rely on traffic stops for criminal interdiction purposes (i.e. pretext stops). Neighborhood deployment patterns of regular patrol units are likely influenced by crime and calls for service concentrations rather than accident locations and high traffic intersections. If the racial/ethnic proportions of traffic unit stops differ from regular patrol unit stops it seems more logical that these differences are the result of intensified regular patrol, particularly at night, in community areas with higher crime, disorder, and calls for service.

Methodology: To do this analysis requires traffic stop data that makes a distinction between stops made by traffic units compared to regular patrol or data that is able to discern speeding stops made with a radar from all other stops. We were able to accomplish this benchmarking approach with the PPB data because we could match traffic stops with the full CAD data which lists unit type involved in the stop. The percentage of stops made by race/ethnicity for the traffic unit is compared to the percentage of stops by race/ethnicity for the regular patrol units.

PPB Illustration: Table 3 in Appendix A shows an analysis of Portland Police traffic unit stops compared to regular patrol unit stops from 2004 to 2008. The traffic unit accounts for 16% of all traffic stops in Portland. African American drivers are the only racial/ethnic group to have a proportion of regular patrol stops that is over 5% greater than their proportion of traffic unit stops. African Americans comprise 16.3% of regular patrol stops and 6.4% of traffic unit stops. Hispanic drivers comprise 10.1% of regular

patrol stops and 5.4% of traffic unit stops; close to the 5% criterion. The percentage of stops by race/ethnicity for the traffic unit is very similar to population percentages for race/ethnicity. This may be an indication that there is little differential driving behavior across race/ethnicity. In other words, drivers of all races and ethnicities seem to be equally likely to break traffic laws. Studies have shown that almost all drivers have some vehicle code violation while driving (Lamberth, 2003). An additional analysis not presented in this report examined only speeding stops made by the traffic unit using radar and found a similar racial/ethnic breakdown of stops as the analysis of all traffic unit stops.

The fact that regular patrol units are more likely to stop African American drivers compared to the traffic unit does not provide good evidence that regular patrol officers are more susceptible to conscious or unconscious biases than traffic patrol. It doesn't make sense that bias would be present in one unit but not another, particularly since personnel from the two units are likely changing over time. The traffic unit analysis is not able to rule out whether African American drivers experience greater exposure to regular patrol units based on where and when they're more likely to be driving. The racial/ethnic differences between traffic and regular patrol units are likely based on more proactive stops (e.g. pre-text stops) and a focus on crime control by regular patrol units in the most criminally active neighborhoods. The next analysis under Benchmarking Option # 4 illustrates that stops of African Americans are clustered in a quarter of the city's neighborhoods where over half of the citizen-calls for service, violent crime, and traffic stops originate and where most African Americans live.

Limitations:

- If regular patrol stops are higher, the analysis is unable to rule out differential exposure to law enforcement as a source of disparity.
- The logic behind this benchmark may be more suitable for highway traffic enforcement as opposed to analysis for a large city.
- Unable to assess internal differences in individual officer's rates of making stops
- Usually cannot control for out of town drivers traveling through city and being stopped.

Benchmarking Option # 4: Testing for differential police exposure

Description and Expected Rate: The next benchmarking option does not fit neatly into a benchmarking approach because it is difficult to determine what an expected rate should be. However, testing for differential police exposure addresses an important limitation to population-based benchmarking and provides important contextual information to citywide stop patterns. Recall that the best benchmark approaches should be able to rule out whether exposure to law enforcement might vary by race (Schell, et al., 2007). Minority drivers may be stopped or searched more often because they are more likely to be exposed to law enforcement. They may drive more often or, more likely, in regions with greater police presence, so that any infraction they make would be more likely to be noticed. Our approach to examining differential exposure

requires an assessment of whether the locations (i.e. neighborhoods) where minority residents reside and concentrations of minority stops are also neighborhoods that experience the highest numbers of citizen calls for police service and violent crimes. If this threshold is met, the argument that minority populations experience differential exposure to law enforcement is strengthened and evidence that police bias is a contributing factor to stop or search disparities is weakened. Neighborhoods that experience the highest citizen calls for police service and violent crime are likely to attract the most police presence and proactive enforcement tactics, including pretext stops, to address crime, drugs, guns, and violence. If minority populations are concentrated in these areas they are at greater risk for being stopped and searched.

Methodology: There is no established methodology for examining differential exposure to our knowledge. Our approach begins by using a population-based benchmarking approach to identify minority groups that are stopped 5% more than their present makeup of the population. We only used stops made by the regular patrol units because traffic patrol did not exhibit strong racial/ethnic variation. Population and stop data broken out by geographic areas for the racial group of interest must be available. Stop data is then mapped to smaller geographic units of analysis like police beats, neighborhoods, census tracts, or blocks. Data on citizen-initiated calls for service and violent crime, which draw police activity and proactive enforcement strategies, must be available and measured at the same unit of analysis as the stops (i.e. neighborhood, beat, census tract). To determine differential exposure rank the geographic units of analysis by numbers of calls for service and then by violent crimes and average the rankings. Then split the geographic units into quartiles representing: 1) very high calls & violence, 2) high calls & violence, 3) moderate calls & violence, and 4) low calls & violence. Examine the percentage of calls for service, violent crime, minority population %, and % of minority stops that occur in the very high calls and violence neighborhoods. If over 50% of the minority population reside in the highest quartile of calls for service and violent neighborhoods and over 50% of the minority stops occur in those neighborhoods the threshold for differential law enforcement exposure is reached.

PPB Illustration: Table 4 in Appendix A provides evidence that African American drivers are likely to experience greater exposure to law enforcement in Portland, thus increasing their risks for being stopped and searched. This greater exposure may provide some explanation for why African American drivers have higher stop and search rates than White drivers in Portland. The analyses focus on African American drivers because they exhibit the largest difference in the frequency of stopped drivers compared to their population.

Analysis of the geographic locations of African American population and traffic stops in Portland's 94 neighborhoods are illustrated in Table 4 of Appendix A. The data trends reveal the following:

1. 55% of the African American population in Portland resides in the very highest citizen calls for police service and violent crime neighborhoods (n = 24)

neighborhoods). 1.3% of the African American population in Portland resides in the lowest quartile neighborhoods for police service calls and violence.

2. 64% of the African American traffic stops in Portland occur in the very highest calls for police service and violent crime neighborhoods. 0.9% of African American traffic stops in Portland occur in the lowest calls for service and violent crime neighborhoods.

3. The 24 neighborhoods with the very highest calls for police service and violent crime out of Portland's 94 neighborhoods contain 59.9% of the entire city's citizen calls for service and 64.7% of the city's violent crimes known to the police. 59% of all traffic stops by regular patrol units occur in these 24 neighborhoods.

Over half of all citizen-initiated calls for police service, violent crime, and traffic stops come from one quarter of Portland's 94 neighborhoods. Thus, it is safe to assume that police presence and proactive policing tactics are intensified in these 24 neighborhoods. In addition, over half of the city's African American population in Portland resides in these 24 neighborhoods and two-thirds of African American traffic stops occur in these neighborhoods.

It appears that citizen calls for service, neighborhood violent crime, and proactive patrol are all interconnected with increased risks of African Americans being stopped in neighborhoods. This analysis does suggest that African American drivers are at greater risks for being stopped because they are more likely to reside in neighborhoods where crime and police activity is dramatically increased, thus weakening the likelihood that police bias is a contributing factor to stop or search disparities. Our conclusion does not imply that African Americans themselves are more likely to commit crimes given equal circumstances and should be treated with more suspicion.

Limitations:

- Not necessarily a benchmark that can be tracked over time, but can provide a test to assess whether differential exposure to law enforcement is a possible source of stop rate differences.
- Unable to assess internal differences in individual officer's rates of making stops

Benchmarking Option # 5: Crash Data

Description and Expected Rate: Lovrich et al. (2007, p. 12) argue the "most effective denominator benchmark is to compare traffic stop data with rates of involvement in roadway collisions." Collision data are another "blind" benchmark measure that has the capacity to assess both the quantity and quality of driving in a particular area. The proportion of at-fault drivers involved in crashes by race/ethnicity would provide an indication of driving behavior by race/ethnicity. The proportion of all drivers involved in crashes by race/ethnicity would provide an indication of both driving frequency and behavior.

Methodology: The racial/ethnic proportion of crash drivers is compared to the racial/ethnic proportions of all drivers stopped. Lovrich, et al. (2007) apply the 5% criterion difference to determine if the disparity warrants concern.

PPB Illustration: No data available. Methods for officially reporting crashes in Oregon do not include information on the race of drivers involved in crashes.

Limitations:

- Unable to rule out differential exposure to law enforcement as a source of bias.
- Unable to assess internal differences in individual officer's rates of making stops
- Usually cannot control for out of town drivers traveling through city and being stopped.

Benchmarking Option # 6: Observations

Description and Expected Rate: The purpose behind field observations are to establish an accurate benchmark of driving behavior through *direct field observation* by two or more coders recording the racial and ethnic composition of drivers on a particular roadway. The goals of observation can be to benchmark driving prevalence by race/ethnicity (e.g. what is the racial/ethnic frequency of drivers on the road) or driving behavior (e.g. what is the racial/ethnic frequency of drivers who are breaking traffic laws). Observing driving prevalence is much easier than assessing driving behavior and is similar to using a population benchmark, but has the capacity to better assess the presence of actual drivers on the road by race/ethnicity. Population benchmarking assumes every race/ethnicity is equally likely to be out driving. Observing driving behavior on the other hand directly addresses a major concern with population benchmarking because it measures differences across race/ethnicities in violating traffic laws. The most commonly chosen traffic offense to observe is speeding, partly because most of the observation studies have focused on highway patrol. Similar to using a crash benchmark, speeding violations may not be the best benchmark to capture the common types of traffic violations that occur in urban cities.

Methodology: There are a variety of methods for conducting observations. For a detailed review of different observational approaches and methodological issues refer to Engel et al. (2005, p. 219-232). Two different noteworthy approaches are used by Engel et al. (2005) in Pennsylvania and Lovrich, et al. (2007) in Washington State. Engel et al. (2005) with the assistance of the Pennsylvania State Police used trained university student observers to apply RADAR technology in the observation approach. Within each of the selected Pennsylvania twenty counties, research assistants completed a total of 10 days of observation (approximately 7-8 hours per day, for a planned total of about 1,500 hours of observation). Observers split their time coding the race of the drivers at selected locations (Caucasian, Black, or non-Caucasian) and utilizing RADAR to classify drivers by race and speed. The use of RADAR improves the validity of this approach in capturing the degree of traffic law violators by race. In contrast, Lovrich et al. (2007) used high speed cameras/lenses to photograph drivers at

select locations during the daytime; they did not try to observe traffic law violations. The use of photography improved the coding of race/ethnicity because two independent coders could closely examine the photograph and magnify its resolution compared to having to make a split-second decision on the race out in the field.

PPB Illustration: No data available.

Limitations:

- Unable to rule out differential exposure to law enforcement as a source of bias, unless law enforcement presence is also being observed.
- Only observing driving prevalence does not control for differences in driving behavior, but is an improvement over census estimates and should be compared.
- The choice of locations to observe and times is critical. Because observations cannot be conducted accurately at night, estimates of driving behavior and prevalence may be inaccurate. If observation locations do not consider concentrations of race/ethnicity populations observation estimates can be skewed.
- Unable to assess internal differences in individual officer's rates of making stops
- Usually cannot control for out of town drivers traveling through city and being stopped.
- Can be an expensive, complex, and time consuming approach and difficult to repeat over time.

Benchmarking Option # 7: Internal stop benchmark

Description and Expected Rate: The basic idea behind an internal stop benchmark is to compare each officer to other officers who patrol the same neighborhoods at the same times and with the same assignment. Since matched officers are patrolling the same areas at the same times, the expected racial distributions of stops should be the same. The analysis highlights officers who appear to stop drivers of one race disproportionately.

Methodology: There are a variety of methodologies used to create an internal benchmarking approach. Internal benchmarking studies for Cincinnati PD, Washington State Troopers, and Wichita PD all used different methodologies. The first key methodological issue for internal benchmarking is matching similarly situated officers. Withrow (2009) notes this entails a consideration of: 1) what the officer is assigned to do, 2) where the officer is assigned to work, and 3) when the officer works. Stop data will need to contain location of stops, time of day, and type of patrol or specialization. For example, Schell et al. (2007) recommend trying to match stops between officers on the same block, which proved difficult, so they ended up matching some officers by blocks but most officers working in the same neighborhoods. Some officers may be assigned to patrol a very narrow section of a neighborhood, which could make them incomparable to officers who work the entire neighborhood or multiple contingent

neighborhoods. To create a robust statistical comparison the matched officers should also have at least 50 stops a piece at those same locations and times. The second key methodological issue is how to determine whether an officer is significantly above the internal benchmark for similarly situated officers. Schell et al. (2007) use a complex z-score statistic with a 50% outlier probability cutoff. Officers who exceed the internal benchmark of racial stops percentages by 5% are considered “outliers” by Lovrich, et al. (2007). Withrow (2009) defines non-normal officers as those with stops that are 1.5 times the overall beat rate for that race/ethnic group. An internal benchmark analysis can only identify officers that are stopping minorities in higher proportions to their colleagues, whether this is due to illegitimate or legitimate reasons needs to be further investigated by the department.

PPB Illustration: No data available.

Limitations:

- These analyses do not prove or disprove that any differences found are due to racial profiling. However, identifying outlying cases may provide a department with a framework for ensuring that their officers’ behavior is in-line with department policies. Any outlying cases should be followed up with additional examination of the data and other department records and feedback.
- This technique assumes that most officers make stop decisions without the use of racial biases. If all or most of the officers in a matched group were to have abnormally high stop rates of certain minority groups, the benchmark of the group mean would be misleading.
- The analyses can be time consuming and some may require assistance from outside of the department.
- The process of this investigation may bring discomfort to some in the police department. The officers under investigation need to be reassured that their actions are presumed innocent until a full review is completed (Withrow, 2009) and be given an understanding for the importance of this process.

Benchmarking Option # 8: Multivariate Analysis of Search Decision-Making

Description and Expected Rate: Examining racial differences in the likelihood of experiencing various outcomes of a traffic stop can be helpful in determining whether racial disparities in treatment exist. One outcome that can be examined is search rates, and in particular, whether certain racial groups are more likely to experience discretionary searches. Examining search rates allows one to bypass using an external source to approximate an expected rate since, given the assumption that people of all racial backgrounds equally commit crime and traffic infractions, one would expect there to be little differences in their search rates. However, this assumption may not be accurate under some circumstances, which is important to examine as well. Unlike looking for disparities in traffic stop rates, you can more easily use multivariate analyses when examining outcomes. This allows one to control for various other factors that may be related to one being searched, such as the reason for the stop, the seriousness of the offense, location of the stop, etc., if the data has been collected on those variables.

Racial differences in search rates may occur for legitimate or illegitimate reasons; careful analysis of the data can help to determine why, if any, differences exist. The multivariate technique expects, 1) race/ethnicity, by itself, to produce a very weak model in predicting searches, and 2) racial and ethnic minority drivers should be no more likely than white drivers to be searched when controlling for other factors. If one and preferably both of the above expectations are proven the existence of systemic conscious or unconscious bias by officers in making search decisions is weakened.

Methodology: Analysis of search rates will usually begin with descriptive statistics. One may simply look at the rate in which each racial group is searched with frequencies or crosstabs. If there are no differences, or only trivial differences found in the search rates, there may be no reason to explore the data further if one is only interested in whether certain racial groups are searched more frequently than Whites overall. However, if one is interested in whether a specific group of characteristics puts one more at risk for being searched (i.e. would a young, African American, male, at night be equally as likely to be searched as a young, White, male, at night) or if racial differences are found in the descriptive statistics, it can be useful to use multivariate statistics. Appropriate models for analyzing searches are binary, multinomial, or multilevel logistic regression models. These models allow one to simultaneously test the impact of multiple characteristics surrounding a stop on having a search. Ideally a multilevel multinomial logistic regression analysis is used to better capture the relationship of neighborhood characteristics (i.e. calls for service, crime rates, etc.) to search likelihood. The follow up tests that can be conducted with a multivariate logistic regression model are numerous and should be a reflection of the department and/or community concerns. Some examples of what kinds of questions that can be answered are: 1) Do racial/ethnic differences in search rates exist when considering other characteristics of a stop, such as the reason for the stop, number of passengers, age of the driver, etc., 2) What other characteristics surrounding a traffic stop make one more likely to be searched, 3) Are those with a certain group of characteristics equally more likely to be searched among different racial groups, and 4) How well does race alone predict that one will be searched.

PPB Illustration: Descriptives, crosstabs, and two multivariate multinomial logistic regression models were used to examine PPB non-inventory search rates. Non-inventory searches were chosen for analysis because they allow for greater officer discretion, thus increasing the likelihood that bias could enter into a search decision. Inventory searches on the other hand are often dictated by department policy or routine safety concerns. For example, all persons taken into custody should be searched for officer safety concerns or all vehicles being towed are searched. We examine only regular patrol stops because regular patrol units are responsible for a greater frequency of racial/ethnic stops particularly stops at nighttime.

A simple look at the proportions of stops involving a non-inventory search show that 11.4% of stops involving Native Americans resulted in having a non-inventory search conducted, followed by approximately 9.9% African Americans, 9.8% Hispanic, 5.8% percent of Whites, and 3.5% of Asians. If there were no differences among the non-

inventory searches among the racial groups, there would be an average of 19 less non-inventory searches of African Americans per month, 10 less per month for Hispanics, 1 less for Native Americans, 5 more per month for Asians, and an average of 21 more non-inventory searches per month for Whites. Overall, the findings demonstrate that there are differences in search rates among the racial groups that are stopped, however to what degree race/ethnicity compared to other factors influences search decision-making is unknown.

The results of the multivariate regression model fit statistic reported in Table 5 of Appendix A shows that race alone is not a strong predictor for whether someone will experience a non-inventory search. Having knowledge of someone's race alone, compared to basing our prediction only on the most likely outcome (not having a search), would allow us to reduce our error in prediction by less than 0.0 percent. In other words, we could accurately predict 184 of 36,951 searches among the 187,403 stops with knowing only someone's race (and only at a probability between of .2 to .23).

Next we examined the relationship of some other factors that may be related to being searched and the racial differences in search rates (i.e. Full Model in Table 5). These factors were the gender of the person stopped, the age group (adult or juvenile), whether there was daylight at the time of the stop, whether the person was stopped for a criminal or BOLO (be on the lookout) code, what precinct the person was stopped in, and how economically disadvantaged the neighborhood is where they were stopped. The racial disparities for Native Americans, African Americans, and Hispanics did decrease the non-inventory search odds by 4 to 27 percent when accounting for these other factors (4th column in Table 5), however, these racial groups were still more likely to be searched compared to Whites. In other words, these factors help explain some of the racial differences in the non-inventory search rates noted above but not all of them. Being male, a juvenile, stopped at night, stopped for a criminal or BOLO code, being stopped in the East, Northeast, or Southeast precinct, and being stopped in a neighborhood that was economically disadvantaged all increased one's likelihood of being searched. These factors increase the likelihood that someone of any race will be searched, however, there are some slight differences found in the degree to which these factors impact certain racial groups. In particular, Asians appear to be less impacted by most of these factors compared to any other racial group. While these factors are more likely to increase anyone's likelihood of having a non-inventory search, African Americans and Hispanics that are stopped are more likely to be male and stopped in precincts where more searches are conducted than Whites that are stopped, African Americans are the most likely to be stopped at night, and African Americans, Hispanics, and Native Americans are more likely to be stopped for a criminal or BOLO code and be stopped in neighborhoods that are more economically disadvantaged than Whites.

Overall, the findings show that race is a statistically significant predictor of a driver's likelihood of receiving a non-inventory search, but this finding is partly influenced by the very large sample size, which almost guarantees that significant relationships will be found. More importantly, the results also show that race by itself is a very weak

predictor of who will receive a non-inventory search. Adding other factors that may explain why a driver is searched does improve the prediction of searches better than using race alone. When using all the characteristics of an individual's stop we improved the prediction of searches to 6,439 out of 36,951 searches among the 187,403 stops with (at probabilities of .2 to .65). However, the predictive power of the full model is still very low. Thus, there is weak evidence that systemic bias could explain search disparity in the PPB data. Using race alone can accurately predict only 184 of 36,951 searches among the 187,403 stops.

It is clear that the current stop data being collected by PPB does not sufficiently capture the contextual, dynamic, and individual factors that cause any one officer to engage in a non-inventory search. PPB may want to consider adding other variables to their traffic stop data collection efforts. More specifically, new PPB search data that distinguishes search types like consent, weapon/pat down, and plain view is needed. However, the benefits and disadvantages of adding variables should be carefully considered. Adding more variables may be more beneficial for understanding and improving hit rates or successful searches. If the primary concern for PPB is whether part of the racial disparities in search rates is due to their officers engaging in racial profiling, it would likely be more valuable to PPB to analyze their data within officers.

Limitations:

- Traffic stop and search data without a code for individual officers can be a challenge for assessing whether the findings suggest that any of the officers are engaging in racial profiling, regardless of whether or not some racial groups are found to be searched more than others. It is quite possible for an organization to have a very small percentage of their officers who consciously or unconsciously act upon racial biases and/or others that avoid enforcing the law with certain racial groups. These findings cannot be determined with aggregated stop data across hundreds of officers. However, these analyses are very valuable for assessing the overall relationship of race to being searched and how race may be interacting with other stop and geographic characteristics that help to explain disparities. This information may be valuable to police departments for their evaluation of policy, policing strategies, and communication with the community.
- The analyses are limited to the variables that are collected on traffic stops and searches. Important variables related to search decision making are likely always missing from these analyses, which limits what information can be gained. It is also important for the analyst to be able to determine non-discretionary searches from discretionary searches.
- These types of analyses rely on complete data so cases with missing data cannot be included in the analyses. However, one can analyze the cases that are missing to help determine whether or not there are any important differences between the cases with missing data and the rest of the cases. This was done with the PPB data before conducting the analyses above and no apparent differences between these two groups were found.
- Analysis and interpretation is complex so consulting with someone outside of the agency may be necessary.

Benchmarking Option # 9: Internal Search Rates

Description and Expected Rate: Examining racial differences in search rates between officers that are similarly matched can be valuable for assessing racial disparities within a department. With this methodology, one would expect to find that officers who are similarly matched in job characteristics are also similarly matched in their racial proportions of stops and search rates. Officers' whose rates or percentages of searches are one or two standard deviations above the mean for their matched group would be considered "outlier" officers. This methodology is a first step towards assessing whether certain officers within a department may be allowing their racial biases to impact their decision making. Examining search rates across similarly situated officers is preferable for assessing potential biases because race/ethnicity is not always visible before the officer approaches the vehicle. However, the analysis can only identify officers that are stopping or searching minorities in higher proportions to their colleagues, whether this is due to illegitimate or legitimate reasons needs to be further investigated by the department.

Methodology: The best research methodology would need to be determined based on the amount of officers in an organization, the amount of searches in the data, the proportion of different minority groups in the stop data, how officers' schedules are organized (do they rotate between day, swing, and graveyard shifts), whether officers regularly patrol a given area, and how officers are assigned their work in a specific department. Officer identification is not currently available in the PPB data.

If the officers at PPB generally work a specific shift, assignment, and geographic area, they may be able to utilize the methodology that Lorie Fridell (2004) presents in *By the numbers: A guide for analyzing race data from vehicle stops*. In this guide, she discusses the work of Decker and Rojek (2002) who matched officers in the St. Louis police department and conducted separate analyses for each of these matched groups of officers to determine whether officer's in the matched groups reported similar rates of African American stops, searches, arrests, etc. They used descriptive statistics to calculate each of the officers' rates or percentages of stops or searches, standardized those numbers, and then identified cases that were one or two standard deviations above the mean for the group. Fridell is careful to point out that these outlying cases only identify officers with stop data outside of the norm from their colleagues. Whether outlier officer search rates are due to racial profiling or not, needs to be determined by the department. It is also important to note that a standard deviation or two above the mean can have significantly different meaning depending on how similar the data is for the group as a whole. In other words, a standard deviation above the mean could mean that an officer's stop data differs greatly from his colleagues or very little. An analyst would want to put context around these differences, as well as look for any misleading findings (i.e. if an officer stops and searches one Native American, their search rate of Native Americans would be 100 percent), before presenting the findings to the police department for further investigation.

The above methodology requires that the analyst is able to identify groups of officers that are policing the same population of people. It also requires one to run separate analyses for each variable of interest. If, for example, one is interested in identifying officers with higher search rates of African Americans and/or higher search rates of Hispanics, two analyses for each group of matched officers would need to be conducted. If matching officers is more complex for PPB or if the above methodology yields an unrealistic number of analyses to be conducted for PPB, it's possible that other statistical techniques, such as two-step cluster analysis, would be able to better identify group membership and outliers to those groups. Follow-up analyses could be conducted on outlying cases.

PPB Illustration: Data is not currently available for analysis.

Limitations:

- As noted above, these analyses do not prove or disprove that any differences found are due to racial profiling. However, identifying outlying cases may provide a department with a framework for ensuring that their officers' behavior is in-line with department policies. Any outlying cases should be followed up with additional examination of the data and other department records and feedback.
- This technique assumes that most officers make stop and search decisions without the use of racial biases. While it is likely the case that relatively few officers engage in racial profiling, it is important to check the likelihood of these assumptions with analyzing the aggregated stop or search data as well. If all or most of the officers in a matched group were to have abnormally high stop or search rates of certain minority groups, the benchmark of the group mean would be misleading.
- The analyses can be time consuming and some may require assistance from outside of the department.
- The process of this investigation may bring discomfort to some in the police department. The officers under investigation need to be reassured that their actions are presumed innocent until a full review is completed (Walker, 2002) and be given an understanding for the importance of this process.

RECOMMENDATIONS

The Portland Police Bureau's data collection beginning in 2001 started during the early years of a national movement to address racial profiling through traffic stop data collection. Recent research has been able to better clarify the strengths and weaknesses in traffic stop data collection, analysis, and reporting, yet new research on this issue will continue providing insight and potentially system changes. Perhaps the most important discovery from this growing knowledge base is the practice of using multiple benchmarking strategies to explore whether systemic or individual biases may be operant in a police department. Based on our knowledge of the Portland Police Bureau's data collection system and our examination of their data we offer the following recommendations for the Bureau's efforts in the future.

Data Collection and Recording

- ✓ The Bureau should consider taking steps to address quality control in the data. In particular, 10.8% of traffic stops from 2004-2008 did not contain any race identifier. In addition, 6.8% (21,856 stops) of compliant stops the race was coded as other or unknown making the data unusable. When the CAD data was matched to the traffic stop system, 24% of the CAD data did not contain lat/long coordinates. A thorough review of the different database systems and the sources of missing data may be helpful. Instituting some type of “refresher courses” during roll call, in-service training, or other information outlets that highlight the Bureau’s data recording rules and procedures could be helpful.
- ✓ The Bureau may want to reconsider the coding rule for determining the race/ethnicity of the driver. PPB officers have been instructed to code race/ethnicity as their perception at the time they initiated the stop even though they may have a better indication of race/ethnicity after the stop has occurred. It is possible that a large amount of stops coded as “unknown” are more of an indication that the officer did not know the race at the time of the stop versus “unknown” being an indication that the driver’s race was difficult to discern even after subsequent interaction with the driver. Using the current coding rule, analysis of later enforcement decisions made during stops, such as search decisions and hit rates or arrests by race/ethnicity, lose significant data. Since exploration of search disparity and hit rates offers more methodological validity and direct crime control importance we recommend that officers should code the race of the driver based upon their perception of the driver’s race after the stop has been completed.
- ✓ The Bureau should ensure that there *remains* an easy link between the stop information data system and the CAD data system (i.e. a unique matching ID in both systems). *The CAD data system provides critical contextual information about the stop that is needed to properly test alternative benchmark methods.* Without the CAD data more accurate benchmarking and contextual information regarding the stop is lost.
- ✓ The Bureau should *create* an easy link between the stops information system and their citation data system. Currently there is no link. Linking the stop, CAD, and citation databases with a unique identifier will allow for multiple benchmarking strategies, which is recommended by other researchers (Lovrich, et al., 2007).
- ✓ The Bureau should review the minimum recommended data points for traffic stop collection by the LECC and also the more detailed data point recommendations. These data points are attached in Appendix B of this report. Key additional data points the bureau should consider adding to their traffic stops data collection system are the following:
 - More detailed information on the reason for the stop. In particular, the severity and type of traffic violation (Fridell, 2004). Being able to distinguish “pretext-type” stops should be a key goal.
 - More detailed coding of discretionary searches including consent, plain view, probable cause, and weapon pat down.

- Number of passengers. The number of passengers was a key factor related to discretionary search decisions in Corvallis, Oregon PD.
- Vehicle registration (in state vs. out of state)
- Driver residency (Portland resident, non-Portland resident)

The Benchmarking Problem

- ✓ Census population benchmarking should not be the exclusive benchmark utilized. It can provide an important start to examining traffic stop data, but must be followed by benchmarks that can address limitations regarding differential driving behavior and exposure to law enforcement.
- ✓ The Bureau should ensure their data collection information and systems allow for multiple benchmarking strategies as recommended by Lovrich et al.'s (2007) examination of Washington State Trooper data and Schell et al.'s (2007) examination of the Cincinnati PD data. PPB's current collection system provides more benchmarking options than most Oregon law enforcement agencies collecting traffic stop data. Geographic information on the location of stops, the time of the stop, and traffic versus regular patrol unit indicators allowed for the testing of alternative benchmarks reviewed in this report. These data points should not be dropped and finding simple ways to integrate CAD with stop data and citation data should be developed.
- ✓ PPB should continue to assess the context surrounding stops of minority groups, variations across race/ethnicity in daytime-nighttime stops, and traffic versus regular patrol stops as illustrated in this report. These "blind" methodologies try to rule out or test other explanations of traffic stop disparities.
- ✓ Experts across the country recommend additional benchmarking options that are currently unavailable in the PPB system or Oregon policy:
 - Internal benchmarking: experts recommend looking for significant stop and search differences across officers working in the same location and shift (see Lovrich et al, 2007 and Schell et al, 2007).
 - Examination of the racial characteristics of at-fault and not at-fault drivers involved in crashes. This data can provide a sense of both the driving population and the driving behavior across race/ethnicity (Lovrich, et al., 2007). Currently Oregon crash data forms do not collect information on the race of drivers, but it is a policy that may be changeable with enough interest and backing.
- ✓ Observational studies are another benchmarking option. Using trained observers to code the race/ethnicity of drivers and driving infractions has shown promise as a benchmarking methodology (Lovrich, et al., 2007). If done properly, observational data can provide an estimate of driving prevalence and driving infractions by race/ethnicity.

Policy

- ✓ Our analysis indicates that African American residents are more likely to live in neighborhoods with higher calls for police service and crime, putting them at

greater risk for being stopped and searched compared to other races/ethnicities. There is growing evidence that targeted proactive patrol focused on hotspot crime locations can improve public safety in these areas (McGarrell, Chermak, Weiss, & Wilson, 2001; Rosenfeld, Fornango, Rengifo, 2007; Sherman, Gottfredson, MacKenzie, Eck, Reuter, Bushway, 1996). However, targeted proactive patrol should entail public input and dialogue and be weighed against intended and unintended consequences (McGarrell et al., 2001). One unintended consequence may be tension between the police and community and the public may distrust or misinterpret the true intentions of law enforcement presence. The Bureau should work to illustrate through research and anecdotal evidence their successes in crime control and prevention in key neighborhoods. The Bureau needs to continue to have an open dialogue with neighborhoods that receive more proactive police patrol in order to explain the motivations and intent behind their presence and illustrate the potential successes in preventing and controlling crime.

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APPENDIX A:

Table 1. Census Population Benchmarking Example

All Traffic Stops in Portland							
		Population*	Stops**	Absolute Difference	Relative Difference	Annual Stop Rate per 1,000	White Rate Ratio
ASIAN	#	24,700	13,328	-1.3%	-22.0%	119.9	0.87
	%	5.7%	4.4%				
AFRICAN AMERICAN	#	26,003	43,887	8.6%	144.0%	375.1	2.73
	%	6.0%	14.6%				
HISPANIC	#	32,909	28,196	1.8%	23.9%	190.4	1.38
	%	7.6%	9.4%				
NATIVE AMERICAN	#	4,799	891	-0.8%	-73.2%	41.3	0.30
	%	1.1%	0.3%				
WHITE	#	345,821	214,074	-8.4%	-10.5%	137.6	REF
	%	79.6%	71.3%				

**Based on 2005 est. population 16+ ** Stops from 2004 through June 2008*

Note: 21,856 (6.8%) stops with race coded as unknown/other excluded.

Limitations of census population benchmarking:

- May not be a good indicator of driving prevalence/frequency by race/ethnicity and cannot rule out differences in traffic law violations by race/ethnicity.
- Unable to rule out differential exposure to law enforcement as a source of disparity.
- Unable to assess internal differences in individual officer’s rates of making stops.
- Usually cannot control for out of town drivers traveling through city and being stopped.
- Racial/ethnic distributions within a city may change rapidly over time and not be properly reflected in decennial census data. A disparity index can also be misleadingly high when a minority group is in low proportions in the stop and population benchmark.

Table 2. Daytime Versus Nighttime Stops Example

Traffic Stops During Day and Night				
		Daytime Stops*	Nighttime Stops*	Night-Day Difference in % of Stops
ASIAN	#	4,433	8,895	0.7%
	%	4.0%	4.7%	
AFRICAN AMERICAN	#	11,453	32,434	6.9%
	%	10.3%	17.2%	
HISPANIC	#	10,505	17,691	-0.1%
	%	9.4%	9.4%	
NATIVE AMERICAN	#	349	542	0.0%
	%	0.3%	0.3%	
WHITE	#	84,720	129,353	-7.5%
	%	76.0%	68.5%	

* Stops from 2004 through June 2008
 Note: Stops with race codes as unknown/other excluded

Limitations of daytime versus nighttime stops benchmarking:

- Unable to rule out differential exposure to law enforcement as a source of bias.
- Unable to assess internal differences in individual officer's rates of making stops
- Usually cannot control for out of town drivers traveling through city and being stopped.

Table 3. Traffic Stops Versus Regular Patrol Stops Example

Traffic Stops for Traffic Unit and Regular Patrol					
		Population*	Traffic Unit Stops**	Regular Patrol Unit Stops**	Patrol-Traffic Unit % Difference
ASIAN	#	24,700	1,926	11,326	0.5%
	%	5.7%	4.0%	4.5%	
AFRICAN AMERICAN	#	26,003	3,072	40,674	9.9%
	%	6.0%	6.4%	16.3%	
HISPANIC	#	32,909	2,572	25,308	4.8%
	%	7.6%	5.4%	10.1%	
NATIVE AMERICAN	#	4,799	88	798	0.1%
	%	1.1%	0.2%	0.3%	
WHITE	#	345,821	40,202	171,438	-15.3%
	%	79.6%	84.0%	68.7%	
*Based on 2005 est. population 16+ ** Stops from 2004 through June 2008					
Note: Stops with race codes as unknown/other excluded (21,856 - 6.8%)					

Limitations of traffic versus regular patrol unit benchmarking:

- If regular patrol stops are higher, the analysis is unable to rule out differential exposure to law enforcement as a source of disparity.
- The logic behind this benchmark may be more suitable for highway traffic enforcement as opposed to analysis for a large city.
- Unable to assess internal differences in individual officer's rates of making stops
- Usually cannot control for out of town drivers traveling through city and being stopped.

Table 4. Testing for Differential Police Exposure Example

Neighborhood Groups	Police Service Calls	Police Service Calls %	Violent Offenses 2002-2006	Violent Offenses 2002-2006 %	Total Pop	Total Pop %	African American Pop	African American Pop %	Total Reg. Patrol Traffic Stops	Total Reg. Patrol Traffic Stops %	African American Stops	African American Stops %
Very High Calls & Violence (24 neighborhoods)	766,290	59.9%	10,666	64.7%	237,206	45.4%	18,615	55.4%	122,043	59.2%	20,696	64.3%
High Calls & Violence(24 neighborhoods)	309,449	24.2%	4,047	24.5%	142,380	27.2%	10,620	31.6%	48,229	23.4%	8,137	25.3%
Moderate Calls & Violence (24 neighborhoods)	163,278	12.8%	1,553	9.4%	102,705	19.6%	3,916	11.7%	29,253	14.2%	3,049	9.5%
Low Calls & Violence (22 neighborhoods)	40,469	3.2%	231	1.4%	40,564	7.8%	429	1.3%	6,558	3.2%	285	0.9%
TOTAL (94 neighborhoods)	1,279,486		16,497		522,855		33,581		206,083		32,166	

Note: Calls for service = all citizen-initiated calls for police service and the neighborhood of origin for the call from 2004-2008. Violent offenses 2002-2006 by neighborhood are from the PPB website. Population data by neighborhood are from the 2000 Census. Regular patrol traffic stops by neighborhood are from January 2004 to June 2008.

Limitations:

- Not necessarily a benchmark that can be tracked over time, but can provide a test to assess whether differential exposure to law enforcement is a possible source of stop rates differences.
- Unable to assess internal differences in individual officer's rates of making stops.

Table 5. Multivariate Regression Results Predicting Search Likelihood

Multivariate Analyses¹			
	Race Only Model²	Full Model³	Relationship difference when controlling for other factors⁴
ASIAN	- 43%*	- 47%*	4%
AFRICAN AMERICAN	100%*	89%*	- 11%
HISPANIC	99%*	72%*	- 27%
NATIVE AMERICAN	152%*	148%*	- 4%
Model Fit (Adjusted Count R²)	0.000	0.009	0.009

*** p<.05**

¹ Multivariate models examine whether racial/minorities are significantly different from Whites in search experiences.

² Examines whether race/ethnicity, by itself, is a strong predictor of searches. The number presented is the % change in odds. For example, the odds of an Asian driver experiencing a search compared to Whites is 43% less.

³ Examines whether race/ethnicity controlling for other factors predicts searches. Other factors include: Male, Adult, Stopped at night, Stopped for Criminal or BOLO code, Precinct the stop was made in and the Neighborhood Economic Disadvantage of that area

⁴ Examines how much controlling for other factors decreases impact of race in search decisions

Limitations of multivariate analysis of search decision-making:

- Traffic stop and search data without a code for individual officers can be a challenge for assessing whether the findings suggest that any of the officers are engaging in racial profiling, regardless of whether or not some racial groups are found to be searched more than others. It is quite possible for an organization to have a very small percentage of their officers who consciously or unconsciously act upon racial biases and/or others that avoid enforcing the law with certain racial groups. These findings cannot be determined with aggregated stop data across hundreds of officers. However, these analyses are very valuable for assessing the overall relationship of race to being searched and how race may be interacting with other stop and geographic characteristics that help to explain

disparities. This information may be valuable to police departments for their evaluation of policy, policing strategies, and communication with the community.

- The analyses are limited to the variables that are collected on traffic stops and searches. Important variables related to search decision making are likely always missing from these analyses, which limits what information can be gained. It is also important for the analyst to be able to determine non-discretionary searches from discretionary searches.
- These types of analyses rely on complete data so cases with missing data cannot be included in the analyses. However, one can analyze the cases that are missing to help determine whether or not there are any important differences between the cases with missing data and the rest of the cases. This was done with the PPB data before conducting the analyses above and no apparent differences between these two groups were found.
- Analysis and interpretation is complex so consulting with someone outside of the agency may be necessary.

Appendix B: LECC Minimum Recommended Traffic Stop Data Points Form

Traffic Stop Reporting Form		FORM # 005896
STOP INFORMATION		
DATE OF STOP (MM/DD/YY) / /		
INITIAL REASON FOR STOP (✓ ONE – 1 ST VIOLATION/ACTION THAT BROUGHT VEHICLE TO YOUR ATTENTION)		
<input type="checkbox"/> 1 Major Moving Violation (Speeding ≥ 10mph, running red light, DUI, reckless driving) <input type="checkbox"/> 2 Minor Moving Violation <input type="checkbox"/> 3 Equipment Violation <input type="checkbox"/> 4 License Violation <input type="checkbox"/> 5 Other Reason		
MOST SERIOUS ACTION TAKEN WITH DRIVER (✓ ONE)		
<input type="checkbox"/> 1 None <input type="checkbox"/> 2 Warning <input type="checkbox"/> 3 Citation <input type="checkbox"/> 4 Arrested →		
VEHICLE/DRIVER INFORMATION		
DRIVER AGE (✓ ONE)		DRIVER GENDER (✓ ONE)
<input type="checkbox"/> 1 <16 <input type="checkbox"/> 2 16 to 24 <input type="checkbox"/> 3 25+		<input type="checkbox"/> 1 Male <input type="checkbox"/> 2 Female
DRIVER RACE/ETHNICITY (✓ ONE - BASED ON VISUAL OBSERVATION)		
<input type="checkbox"/> 1 White <input type="checkbox"/> 2 Black/AA <input type="checkbox"/> 3 Hispanic <input type="checkbox"/> 4 Asian <input type="checkbox"/> 5 Am. Indian/Alaskan <input type="checkbox"/> 6 Other		
SEARCHES (exclude incident to arrest searches and vehicle inventories)		
WAS ANY SEARCH PERFORMED BASED ON CONSENT, PROBABLE CAUSE, PLAIN VIEW, OR A WEAPON "PAT DOWN"? <input type="checkbox"/> 0 No <input type="checkbox"/> 1 Yes → <div style="border: 1px solid black; padding: 2px; width: fit-content;">STOP</div>	INITIAL AUTHORITY FOR SEARCH (✓ ONE)	
	<input type="checkbox"/> 1 Consent <input type="checkbox"/> 2 Probable Cause <input type="checkbox"/> 3 Plain View <input type="checkbox"/> 4 Weapon "pat"	
	CONTRABAND FOUND AS RESULT OF SEARCH?	CONTRABAND FOUND DURING THIS SEARCH (✓ ALL THAT APPLY)
<input type="checkbox"/> 0 No <input type="checkbox"/> 1 Yes →	<input type="checkbox"/> Drugs <input type="checkbox"/> Stolen Property <input type="checkbox"/> Alcohol <input type="checkbox"/> Weapon(s) <input type="checkbox"/> Currency <input type="checkbox"/> Other	

Appendix B: LECC Detailed Traffic Stop Data Points Form

OFFICER/DEPUTY ID #	Traffic Stop Reporting Form	FORM # 005896	
STOP INFORMATION			
ROAD TYPE (✓ ONE – 1 ST LOCATION WHERE VEHICLE OBSERVED)		DATE OF STOP (MM/DD/YY)	
1 <input type="checkbox"/> Interstate 2 <input type="checkbox"/> Highway 3 <input type="checkbox"/> City Street 4 <input type="checkbox"/> Other		/ / :	
PRECINCT (✓ ONE – 1 ST PRECINCT WHERE VEHICLE OBSERVED)			
1 <input type="checkbox"/> North 2 <input type="checkbox"/> South 3 <input type="checkbox"/> East 4 <input type="checkbox"/> West 5 <input type="checkbox"/> Downtown 6 <input type="checkbox"/> Other Location			
INITIAL REASON FOR STOP (✓ ONE – 1 ST VIOLATION/ACTION THAT BROUGHT VEHICLE TO YOUR ATTENTION)			
1 <input type="checkbox"/> Major Moving Violation (Speeding ≥ 10mph, running red light, DUI, reckless driving)			
2 <input type="checkbox"/> Minor Moving Violation 3 <input type="checkbox"/> Equipment Violation 4 <input type="checkbox"/> License Violation 5 <input type="checkbox"/> Other Reason			
MOST SERIOUS ACTION TAKEN WITH DRIVER (✓ ONE)		REASON FOR ARREST (✓ ALL THAT APPLY)	
1 <input type="checkbox"/> None 2 <input type="checkbox"/> Warning 3 <input type="checkbox"/> Citation 4 <input type="checkbox"/> Arrested →		<input type="checkbox"/> Traffic Offense <input type="checkbox"/> Contraband <input type="checkbox"/> Warrant <input type="checkbox"/> Other	
DURATION OF STOP (✓ ONE – INCLUDE ANY TIME SPENT ON SEARCH)			
1 <input type="checkbox"/> 0-15 min 2 <input type="checkbox"/> 16-30 min 3 <input type="checkbox"/> 31-45 min 4 <input type="checkbox"/> 46+ minutes			
VEHICLE/DRIVER INFORMATION			
VEHICLE REGISTRATION (✓ ONE)		VEHICLE OCCUPANTS (✓ ONE)	
1 <input type="checkbox"/> Instate 2 <input type="checkbox"/> Out of State		0 <input type="checkbox"/> Driver only <input type="checkbox"/> Driver and _____ Passengers	
DRIVER AGE (✓ ONE)		DRIVER GENDER (✓ ONE)	
1 <input type="checkbox"/> <16 2 <input type="checkbox"/> 16 to 24 3 <input type="checkbox"/> 25+		1 <input type="checkbox"/> Male 2 <input type="checkbox"/> Female	
DRIVER RESIDENCY (✓ ONE)		1 <input type="checkbox"/> City Resident 2 <input type="checkbox"/> Non-Resident	
DRIVER RACE/ETHNICITY (✓ ONE - BASED ON VISUAL OBSERVATION)			
1 <input type="checkbox"/> White 2 <input type="checkbox"/> Black/AA 3 <input type="checkbox"/> Hispanic 4 <input type="checkbox"/> Asian 5 <input type="checkbox"/> Am. Indian/Alaskan 6 <input type="checkbox"/> Other			
SEARCHES (exclude incident to arrest searches and vehicle inventories)			
WAS ANY SEARCH PERFORMED BASED ON CONSENT, PROBABLE CAUSE, PLAIN VIEW, OR A WEAPON "PAT DOWN"? ↓ 0 <input type="checkbox"/> No 1 <input type="checkbox"/> Yes → STOP	INITIAL AUTHORITY FOR SEARCH (✓ ONE)	WHO/WHAT WAS SEARCHED BASED ON THIS AUTHORITY (✓ ONE)	
	1 <input type="checkbox"/> Consent	1 <input type="checkbox"/> Driver	4 <input type="checkbox"/> Driver & Vehicle
	2 <input type="checkbox"/> Probable Cause	2 <input type="checkbox"/> Passenger/s	5 <input type="checkbox"/> Driver & Passenger/s
	3 <input type="checkbox"/> Plain View	3 <input type="checkbox"/> Vehicle	6 <input type="checkbox"/> Passenger & Vehicle
4 <input type="checkbox"/> Weapon "pat"	7 <input type="checkbox"/> Driver, Pass., & Veh.		
↓ 0 <input type="checkbox"/> No	CONTRABAND FOUND AS RESULT OF SEARCH?	CONTRABAND FOUND DURING THIS SEARCH (✓ ALL THAT APPLY)	
1 <input type="checkbox"/> Yes →	0 <input type="checkbox"/> No	<input type="checkbox"/> Drugs <input type="checkbox"/> Stolen Property	
	1 <input type="checkbox"/> Yes →	<input type="checkbox"/> Alcohol <input type="checkbox"/> Weapon(s)	
		<input type="checkbox"/> Currency <input type="checkbox"/> Other	
↓ 0 <input type="checkbox"/> No	ARREST MADE BASED ON RESULTS OF SEARCH?	WHO WAS ARRESTED BASED ON RESULTS OF THIS SEARCH (✓ ONE)	
1 <input type="checkbox"/> Yes →	↓ 0 <input type="checkbox"/> No	1 <input type="checkbox"/> Driver	
	1 <input type="checkbox"/> Yes →	2 <input type="checkbox"/> Passenger/s	
		5 <input type="checkbox"/> Driver & Passenger/s	