

16.4% included quantities for sale and 16.4% included quantities for transportation. Furthermore, racial/ethnic differences in drug seizure amounts were evident as Whites were most likely to have personal use amounts of drugs seized during searches resulting in drug seizures, while Hispanics and Blacks were significantly more likely than Whites to have sale and transportation quantities of drugs seized.

Across the department, search success rates (percent of searches that resulted in the discovery of contraband) varied considerably by the reason for the search. Probable cause, canine alert, warrant, and plain view searches were the most likely to be successful in recovering contraband (ranging from 50%-67%), while vehicle inventories and searches based solely or partially on consent were the least likely to result in the discovery of contraband (10%-15%). As noted above, over three-quarters of the searches department-wide were conducted for low-discretion reasons. In these situations, the likelihood of discovering contraband is largely not related to officer skill or criminal interdiction training.

Search success rates also varied by organizational unit. Of particular importance were the differences in the rates of contraband seizures between canine handlers assigned to the North squad versus those assigned to the Central and South squads. Across all types of searches, canine handlers assigned to the North squad were significantly more likely to report contraband seizures compared to handlers assigned to Central/South squads. This overall gap, however, has narrowed in 2008 compared to 2006 and 2007, as have the squads' search success rates for probable cause and canine alert searches.

The overall Type II (discretionary / guided by legal statute and case law) search success rate for DPS was 44.9%, but success rates varied significantly by race/ethnicity. Type II searches of Native American and White drivers resulted in the seizure of contraband in approximately half of those searches, while only 38.4% of Type II searches of Hispanics resulted in contraband seizures.

Analyses of consent searches revealed racial/ethnic differences in those asked for consent to search as well as refusals to consent. Hispanics were significantly more likely than other racial/ethnic groups to be asked for consent to search and significantly less likely than members of other racial/ethnic groups to refuse consent to search. Not surprisingly, multivariate models predicting Type III searches also indicated that there were statistically significant racial/ethnic disparities in whether or not consent searches are conducted as Hispanic and Black drivers were 3.3 and 2.0 times more likely to be searched based on consent compared to Whites given the same vehicle, stop, and legal characteristics. The strength of these relationships is slightly diminished by the inclusion of additional explanatory variables available in TraCS. The strongest predictor of whether or not a consent search is conducted is the presence of multiple pre-stop indicators of possible criminal activity. Like the previous multivariate search models, the weak overall ability of these models to predict the likelihood of consent searches indicates that this model is likely misspecified (i.e., it does not include other relevant explanatory factors, including refusal to consent, post-stop indicators of suspicion, etc.).

Because consent searches are not solely dependent on officer's discretion (i.e., a citizen may refuse), outcome test analyses of consent search success rates are not recommended. They were, however, conducted, at the request of DPS administrators. The results indicated that Type III searches of White drivers (14.1%) were the most likely to be successful in the discovery of contraband, followed by drivers of other races/ethnicities (13.8%), and Blacks (12.2%). Consent only searches of Hispanics (7.4%) were the least likely to be successful in terms of recovering contraband.

Stops involving undocumented aliens (the majority of which involved a Hispanic driver) were significantly more likely to result in a search than stops involving legal residents. Compared to searches involving legal residents, Type II searches involving undocumented aliens were less likely to produce seizures of contraband while Type III searches involving undocumented aliens were more likely to produce seizures of contraband. When undocumented aliens are considered as another type of criminal activity discovered (despite not resulting in the discovery of contraband per se), both the Type II and Type III search success rates for Hispanic motorists increase. They still remain lower than the search success rates for Whites, but this difference is not statistically significant for Type III searches.

Based on these findings, it is the conclusion of this report that important racial and ethnic disparities exist for searches and seizures conducted during officer-initiated traffic stops. Again, these results are comparable to those reported in the Years 1 and 2 Reports, with little substantive difference in the racial/ethnic disparities discovered except for the rates of discovery of contraband or undocumented aliens now that the data field measuring the latter includes *any* undocumented aliens. These findings, however, do not address the legality of individual searches. The data collected and reported within this document only examine trends and cannot address questions of whether or not individual searches conducted by DPS officers were legally justified or based on discrimination.

As described in Section 2, the transition by DPS to the electronic TraCS data collection system in October 2008 provides more detailed information about searches than was previously collected in KOTS. If the DPS extends the current contract of the UCPI team, analyses that could be conducted for the Year 4 Report will examine target-specific information regarding whether a search was performed, the search authority for that search, and whether contraband was seized during that search for drivers, passengers, and vehicles. These analyses may shed additional light on the reported racial/ethnic disparities in searches and seizures.

RECOMMENDATIONS

Based on the findings reviewed above, a series of recommendations are provided by the UCPI research team. The purpose of these recommendations is to assist DPS administrators in continuing to improve the already rapid progress that is being demonstrated within their agency. These recommendations are divided into the following categories: Data collection and analysis, supervisory oversight, understanding and addressing racial/ethnic disparities.

Data Collection

The development and implementation of the TraCS system is a significant improvement over previous data collection methods. This system provides a more efficient, effective, and reliable means of capturing information related to traffic stops. It will be important to now analyze data collected from this new system and compare to previous reports. There are a few minor adjustments to this data collection system that DPS officials should consider.

Recommendation #1: The DPS should continue to collect and analyze traffic stop data beyond the requirements of the current settlement agreement.

Continued monitoring of racial and ethnic disparities in traffic stop outcomes, particularly searches and seizures is recommended. The DPS should continue to collect and analyze traffic stop data to examine patterns and trends across the agency and across time. The DPS should also extend the current contract with the UCPI research team or hire a different external research team to provide the statistical expertise in conducting these analyses. By comparing multiple years of traffic stop data, particularly as the data quality is improved through TraCS, it is possible to examine the relative effectiveness of any new policies and training (e.g., *Courtesy and Vigilance, Considerations for Effective and Culturally Responsible Law Enforcement in Arizona* Advanced Officer Training instituted earlier in 2009). Further, continual monitoring of traffic stops provides valuable information to the organization, while simultaneously institutionalizing a culture within the organization that inspires fair and equitable policing and demonstrating a public commitment to the same.

Recommendation #2: Develop and maintain a data collection committee to examine the current data collection system and recommend any needed changes.

It is further recommended that DPS officials convene a committee to examine the current data collection effort and consider making minor adjustments. For example, the inclusion of the state of registration is a valuable piece of information as related to criminal interdiction efforts, but was eliminated from the data collection system in the transition from KOTS to TraCS. Another possible addition might be to include a text field where officers may specify the type of contraband seized when they utilize the “other” category. It is also important to bring feedback from the field to administrators regarding the use of the data collection system and officers’ recommendations for improvements.

Finally, it will be important to consider whether any additional elements should be added to the system to better understand reported racial/ethnic disparities. Based on the initial results from the added data elements, some of the reported racial/ethnic disparities can be attributed to drivers’ demeanor, pre-stop indicators of suspicion, undocumented aliens in the vehicle, etc. It is highly probable that other factors unaccounted for within this data collection system might also better predict traffic stop outcomes, including driver & passengers’ behaviors during the stop, as well as the existence of a language barrier between a driver and an officer. These types of factors should be considered and recommendations (if any) should be made for the inclusion of additional data fields. These recommendations, however, must be

balanced with the need for an efficient data collection system. This discussion should be the work of this internal committee (with direct consultation from the UCPI research team).

Recommendation #3: Minor adjustments to the validation rules should be incorporated into the TraCS system to further reduce and/or eliminate the small percentage of remaining errors associated with missing and invalid data.

The data audit in Section 2 revealed the error rate for stop data collected via TraCS in the last three months of 2008 to be only 2.1%, compared to 9.8% for data collected during the previous nine months via KOTS. The TraCS error rate is well under the PERF-recommended threshold of 10% (Fridell, 2004) and nearly reaches the research team's ideal goal of 2% or less for missing/invalid data. It is obvious that instituting an electronic data collection system and its accompanying training have dramatically improved the accuracy and consistency with which stop data are being collected across the department. Although the internal consistency problems associated with the stop data and violation data have also been improved by the simultaneous collection of violation information on the electronic stop data collection form in the TraCS system, minor discrepancies remain. As described in Section 2, a small number of cases indicated violation information for outcomes that were not selected, while other cases indicated a specific outcome but no accompanying violation information. To eliminate these errors, it is recommended that the TraCS data collection system be programmed to only accept violation information when the appropriate outcomes have been selected and to require corresponding violation information for all selected outcomes. Further validation rules, default settings, and error warnings should be explored to continue to lower the small percentage of data that remains affected by missing or invalid data. The UCPI team is optimistic that the data quality will continue to be enhanced through proper data management and supervisory oversight.

Supervisory Oversight

Recommendation #4: DPS field supervisors should continue to be held directly accountable for ensuring the proper collection of traffic stop data by their subordinates.

Phase 2 of the data audit in Section 2 shows slight discrepancies between the stop data and the comparison database of officer activity logs, though the margin of error is well within acceptable limits. The UCPI research team nevertheless recommends that first line supervisors continue quality assurance measures to ensure DPS Officers are completing the data collection form for every contact. Although the electronic data capture has drastically reduced data entry errors, it will not ensure that officers are completing the form during every traffic stop. Continual supervisory oversight and routine data audits, like the weekly cross-checks currently required by DPS, are necessary to ensure the continued accuracy and validity of these data.

One specific area of concern regarding proper data collection is plain view searches. As noted in Section 6, the overall search success rate of plain view searches is 49.6%. By

definition, a plain view search should result in a high contraband seizure rate.³⁹ Further analyses and detailed inquiry indicated that the overall search success rate of plain view searches was due to an improper classification of a search as plain view and/or the improper documentation of contraband seized during these searches. Although these errors were committed by a small number of officers, they resulted in discrepancies that impacted the overall department's search success rates. It is important to recognize that systematic errors committed by only a handful of officers can dramatically impact the overall findings of the study. Therefore, it is recommended that all officers receive refresher training on the data collection system and that supervisors more effectively monitor the information collected by officers.

To assist supervisors in providing this type of oversight, it is recommended that monthly data status reports be developed by the UCPI team and provided to the DPS. These reports would document the number of traffic stops recorded, and some basic information about these stops for all units within the agency. The monthly status reports should be shared with supervisors so they can make any necessary adjustments quickly, rather than waiting for the results documented in final reports based on the preceding year of data. Data status reports were originally proposed by the UCPI research team as an important way to maintain data integrity. They were not developed, however, because the original KOTS data collection system did not capture information in real time (i.e., there was a 6-10 month lag between the traffic stop and entry into the database). With the development of the TraCS data collection system, status reports could be developed for ongoing use. While these reports will not impact the data quality for information already collected during 2009, it can increase the reliability and validity of information collected in 2010.

Recommendation #5: The specific findings documented in this Year 3 Report should be disseminated immediately to DPS supervisory personnel with a clear mandate to continue exploring the reasons for the racial/ethnic disparities reported, and attempt to reduce them if believed to be based on illegitimate factors.

Better understanding of the racial/ethnic disparities in post-stop outcomes is necessary to ultimately reduce these disparities. Across the department, Hispanic, Native American, and Black motorists are significantly more likely to be issued citations, arrested, and searched compared to Whites, even after statistically controlling for reasons for the stop, vehicle, and stop characteristics. Field supervisory staff must be made aware of racial/ethnic disparities in citation, arrest, search, and seizure rates within their jurisdictions.

Although the additional information collected via TraCS has shed some additional light on these relationships, some unexplained racial/ethnic disparities in citations, arrests, and searches remain. It continues to be important for DPS administrators to better understand

³⁹ Note, however, that in the KOTS data collection system (in use for 9 months of the 2008 data collection year), plain smell searches were included as plain view searches. Plain smell searches may be less likely than plain view searches to produce the discovery of contraband because smell often remains even after contraband is removed. In the TraCS data collection system, plain smell and plain view searches are separated. Analyses of 2009 data of these types of searches may provide further insight into the search success rates of these types of searches.

and examine these trends. There are several possible explanations for these elevated rates that can only be determined based on local knowledge of the area and additional information that is not included in the data collection.

Further, it is critical that field supervisory personnel examine their officers' stopping patterns and trends. If DPS officers are engaging in bias policing, it is likely to be revealed at the field supervisory level. While aggregate statistical analyses can provide supervisors with information to identify potentially problematic geographic areas or shifts, ultimately it is the more specific information available to field supervisors (e.g., citizen complaints, feedback from other officers, direct observation of patterns and practices) that will assist in identifying and eliminating any bias practices. For these reasons, it is critical that the DPS continue to improve the quality of its supervisory management and training, with an additional focus on detecting and eliminating officer bias.

Further Examination of Racial/Ethnic Disparities

Recommendation #6: If a contract extension is approved, the DPS should consider providing the additional data captured on the consent to search form to the UCPI team to allow for further exploration in the Year 4 Report of the possible explanations for the continued racial/ethnic disparities in search and search success rates.

Acting on recommendations made in the *Year 2 Report*, the DPS has made changes to the consent to search form to document pre and post stop indicators of suspicion as well as information that confirm criminal or other suspicious activity where no seizure was made. These qualitative data could provide invaluable context for the quantitative search and seizure data similar to the information gleaned from the focus groups with DPS officers in 2008.

The analyses of 2008 data indicated that, as in previous reports, even after considering legal variables, stop, vehicle, and other driver characteristics, Hispanic, Native American, and Black drivers were all more than twice as likely to be searched compared to White drivers. The higher rates of Hispanic searches specifically, however, do not produce comparable rates of seizures. Although Hispanic motorists were significantly more likely to be searched during officer-initiated traffic stops compared to Whites, they were significantly less likely to be found in possession of contraband. There are a number of reasons that might account for these racial/ethnic disparities, including legitimate explanations, or possibly officer discrimination / bias. In an effort to better understand racial/ethnic disparities in search and seizure rates, the UC research team conducted focus groups with canine handlers and officers assigned to the Highway Division that were actively engaged in search and seizure activity. These focus groups provided context for criminal interdiction work and greater insight with which to interpret the statistical findings related to searches and seizures.

The DPS is considering voluntarily extending the contract with the University of Cincinnati to include a fourth year of data analysis. As noted in the first recommendation, the UCPI team highly recommends this, as a fourth year of analysis will allow the UCPI team to analyze a full year of data collected electronically and more fully explore the new data elements implemented in October of 2008. The quantitative analyses of these data could be

enhanced considerably by the examination of qualitative data regarding pre and post stop indicators of suspicion as well as information that confirm criminal or other suspicious activity where no seizure was made (e.g., admission, drug debris, paraphernalia). This information, collected on the revised consent to search form, would likely provide additional insight into DPS officers' search and seizure activities in the same way that the focus group interviews provided invaluable context and a better understanding of the complexities of criminal interdiction work. Therefore, if the contract extension is approved, it is recommended that these data be made available to the UCPI team for inclusion in the Year 4 analyses.

Conclusion

The racial/ethnic disparities in traffic stop outcomes reported within this document for stops initiated by officers of the Arizona Department of Public Safety are not unique to this department. Instead, they are consistent with findings from state and local jurisdictions across the country, particularly findings related to racial/ethnic disparities in searches and seizures. This suggests that rather than individual police officer bias, there are larger cultural and/or organizational explanations for these disparities – particularly for searches of Hispanic drivers.

As demonstrated by the DPS's ongoing data collection and its responsiveness to the UCPI research team's recommendations from the *Years 1 and 2 Reports*, DPS officials are dedicated to an innovative and professional approach to understanding and altering racial/ethnic disparities in traffic stop outcomes. Expedient implementation of the new recommendations provided above will assist the DPS in continuing this approach as well as providing equitable treatment across racial/ethnic groups and maintaining their legitimacy among the citizens of Arizona.

If a contract extension is reached with the UCPI team for a fourth year of data analysis, an update to this report will be delivered in November 2010, based on the statistical analyses of data collected during traffic stops in 2009, which would provide the first full year of data collected via the redesigned and expanded TraCS electronic data collection system. It is expected that the analyses of a full year of these improved data will lead to a better understanding of the racial/ethnic disparities in traffic stop outcomes that will enable DPS administrators to make informed changes in policies, procedures, and training to ensure the continued delivery of unbiased policing services to Arizona citizens.

7. REFERENCES

- Ayres, I. (2001). *Pervasive Prejudice? Unconventional Evidence of Racial and Gender Discrimination*. Chicago: The University of Chicago Press.
- Becker, G.S. (1957). *The Economics of Discrimination*. Chicago: University of Chicago Press.
- Engel, R.S. (2008). A critique of the “outcome test” in racial profiling research. *Justice Quarterly*, 25, 1-36.
- Engel, R.S. (2005). Arizona Department of Safety Traffic Stop Data Report, January 2003- December 2003, Focus on I-17. Report submitted to the U. S. District Attorney’s Office (District of Arizona) in the matter of *U.S. v. Bustamante*.
- Engel, R.S. (2004). Arizona Department of Safety Traffic Stop Data Report, January 2003 - December 2003. Report submitted to the U. S. District Attorney’s Office (District of Arizona) in the matter of *U. S. v. Gayle* and the Coconino County, Arizona Prosecutor’s Office in the matter of *Arizona v. Palacios*.
- Engel, R.S., Cherkauskas, J.C., & Beck, S. (2008b). Identifying Best Practices in Criminal Interdiction Activities for the Nebraska State Patrol. Submitted to the Nebraska State Patrol, Lincoln, NE.
- Engel, R.S., Cherkauskas, J.C., & Smith, M.R. (2008a). *Traffic Stop Data Analysis Study: Year 2 Final Report*. Submitted to the Arizona Department of Public Safety, Phoenix, AZ.
- Engel, R.S., Cherkauskas, J.C., Tillyer, R. (2007a). *Traffic Stop Data Analysis Study Report: Final Literature Review and Review of Other Jurisdictions*. Submitted to the Arizona Department of Public Safety, Phoenix, AZ.
- Engel, R.S. & Tillyer, R. (2008). Searching for equilibrium: The tenuous nature of the outcome test. *Justice Quarterly*, 25, 54-71.
- Engel, R.S., Tillyer, R. & Cherkauskas, J.C. (2007b). *Understanding Best Search and Seizure Practices: Final Report*. University of Cincinnati, Submitted to the Ohio State Highway Patrol, Columbus, OH.
- Engel, R.S., Tillyer, R., Cherkauskas, J.C., & Frank, J. (2007c). Traffic Stop Data Analysis Study: Year 1 Final Report. Submitted to the Arizona Department of Public Safety, Phoenix, AZ.
- Fridell, L. (2004). *By the Number: A Guide for Analyzing Race Data from Vehicle Stops*. Washington, D.C.: Police Executive Research Forum.
- Knowles, J., Persico, N., & Todd, P. (2001). Racial bias in motor vehicle searches:

- Theory and evidence. *The Journal of Political Economy*, 109, 203-229.
- Liao, T.F. (1994). *Interpreting Probability Models: Logit, Probit, and Other Generalized Linear Models*. Thousand Oaks, CA: Sage.
- Ramirez, D., McDevitt, J., & Farrell, A. (2000). *A Resource Guide on Racial Profiling Data Collection Systems: Promising Practices and Lessons Learned*. Washington, D.C.: U.S. Department of Justice.