



The Science of Justice:

Berkeley Police Department
National Justice Database City Report
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Table of Contents

| | |
|--|----|
| Overview | 4 |
| National Justice Database Framework | 5 |
| Executive Summary | 7 |
| Recommendations..... | 9 |
| History of City Involvement in the National Justice Database Project..... | 11 |
| Section 1: Data | 13 |
| Data Provided | 14 |
| Data Not Provided | 15 |
| A Note on Racial Disparities in Berkeley | 15 |
| Section II: Racial Disparities in Vehicle and Pedestrian Stops | 17 |
| Section 2A: Racial Disparities in Vehicle Stops..... | 17 |
| Section 2B: Racial Disparities in Pedestrian Stops..... | 32 |
| Section 2C: Interpretation of Racial Disparities in Vehicle and Pedestrian Stops | 39 |
| Part III: Racial Disparities in Use of Force | 42 |
| Section 3A. Use of Force Counts and Racial Disparities | 43 |
| Section 3B. Interpreting Disparities in Use of Force..... | 50 |
| Appendix A | 57 |

Overview

How do you measure justice? Despite the philosophical, methodological, and logistical difficulty of this question, law enforcement executives are increasingly asked to turn over data with the aim of evaluating how fairly they are doing their jobs. At the same time, many community members perceive law enforcement activities to be targeted toward—and biased against—non-White people. Communities plagued by mass incarceration and highly publicized police shootings have called for greater transparency and accountability on the part of the police. And research shows that positive police-community relationships are crucial for safer communities: residents are more likely to engage as witnesses and as partners in crime reduction if they believe in the legitimacy of police as equitable and impartial agents of the law.²

Increasingly, then, courageous and forward-looking law enforcement executives seek hard metrics on current practices as a way to identify effective policy reforms aimed at reducing bias and improving police-community relations. They are seeking out partnerships with prominent researchers to solve this riddle, and to lead policing in the nation with respect to civil rights and public accountability.

Data collection and analysis can be essential tools that reveal empirical realities and illuminate options that might advance equity in public safety. Too often, law enforcement data have been captured with an eye toward accounting or litigation, without leveraging the data to optimize performance. But just as CompStat ushered in a new era where police could be accountable for crime rates, data on racial disparities—and the inferential analyses we pair with them here—can be used to identify opportunities to improve public trust and safety. Consequently, in addition to specific policies designed to address opportunities for improvement revealed by these analyses, we routinely recommend including better data accountability as part of the path forward.

The aim of this report is to begin to provide the Berkeley Police Department (BPD) a valuable resource toward that end. It is intended as a preliminary guide to illuminate options that might advance equity in public safety, providing straightforward statistical answers to some of the most pressing questions facing BPD and other law enforcement agencies.

The Center for Policing Equity (CPE) aims to address the needs of both law enforcement and communities, who can avail themselves of the CPE's National Justice Database (NJD). The NJD collects policing data to measure fairness and improve policing equity, and to make its findings transparent to law enforcement and to communities. The NJD offers a rigorous analytic framework to make sense of policing data, seeking to identify and understand the

² See Tom R. Tyler, *Why People Obey the Law* (Princeton, NJ: Princeton University Press, 2006).

consequences of policing activities and the sources of racial disparity.³ In this research brief, we present empirical documentation of the degree of racial disparity in BPD's policing practices, as well as analysis and interpretation of the factors that might contribute to such disparity. While the results are mixed, our analysis reveals encouraging findings and heartening trends. It also flags questions and disparities that warrant further investigation and reform.

Our purpose is to demonstrate what can be learned by thoroughly analyzing policing data. This report, like those produced for other NJD participants, aims to offer law enforcement officials a road map toward greater transparency and accountability in police practices, so they can transform agencies and adopt more just and equitable means of promoting public safety.

National Justice Database Framework

The NJD analytic framework aims to distinguish among three broad types of explanations for racial disparities in policing, any or all of which can play a role in producing racial disparities in the City of Berkeley, as elsewhere:

1. Disparities that arise from **community characteristics**. For instance, high crime rates or poverty within a community may draw increased police attention. Individuals within a community may place disproportionately more calls for service to police.
2. Disparities that arise from **police characteristics**. For instance, police may patrol some neighborhoods with less commitment to the dignity of those who live there. Or, deploying more officers to high-crime neighborhoods may produce disproportionately more interactions between police and non-White communities.
3. Disparities that arise from the **relationships between communities and police**. For instance, mistrust of law enforcement may incite members of some communities to flee approaching officers or resist arrest more than members of other communities do. Similarly, a sense that communities do not trust or respect police may cause officers to feel unsafe or defensive in some neighborhoods.

While the whole story likely incorporates elements of each of these explanations, the comprehensive NJD framework allows departments to learn about how all three contribute to racial disparities. By combining police administrative data with population data (e.g., income, education, racial demographics), police department climate surveys, and community surveys,

³ In this report, "racial" is used as a shorthand for the demographic groups described in BPD records as Asian, Black, Hispanic, White and Other/unknown. When our analyses compare BPD policing statistics to census data, the first four of these categories are mapped onto the following census categories, respectively: non-Hispanic Asian, non-Hispanic Black, Hispanic (any race), and non-Hispanic White. All other ethnoracial census categories are mapped onto Other/Unknown. This simplified terminology does not represent a claim that such persons belong to monolithic "races," or indeed that the category of "race" has objective meaning independent of its social context. Furthermore, it should be noted that BPD racial categories describe the officer's perception of the individual's race or ethnicity. This perception may or may not match the individual's own racial or ethnic identity.

we can examine the role that each explanation plays in the disparities that both police departments and communities want to reduce.

This report carefully analyzes the role that community- and police-level factors (explanations 1 and 2) may contribute to racial disparities. The resulting analyses can be used to steer community engagement, relationship building, and continued departmental reform. It is important to emphasize that the persuasive power of analytics grows substantially the longer a department measures and analyzes important indicators. As a result, we encourage BPD, the people of Berkeley, and all law enforcement agencies involved in the NJD to see these analyses as an initial benchmark against which future progress can be measured. With many departments set to receive similar briefs in the coming months and years, we hope this analytic framework will serve as a road map for police and communities—establishing where they are now and charting a path toward a more just future.

It should be noted that no police department in the country currently collects all the data recommended by the NJD analytic framework (although several departments collect each element of non-survey data). BPD has been very forthcoming in response to CPE requests for data-sharing and information. We encourage BPD to continue its collection of vehicle stop analysis, and to include information on stops that do not lead to citations, including information on whether these stops lead to searches or seizures of passengers or searches of the vehicle. We also encourage BPD to continue its collection of use of force data, and to include comprehensive data on the use of firearms and on incidents of deadly force. In addition, we encourage BPD to indicate in field card data the basis for the stop, in order to enable similar analysis. This information will allow more powerful and comprehensive analyses to be conducted on a larger dataset that could identify trends and policy effects across multiple years of BPD practice. Expanded data collection and analysis will also afford a significant opportunity for greater clarity about fairness in policing that could be afforded by further collection and release of policing data. This will benefit not only BPD and the communities it serves, but law enforcement agencies and communities nationwide.

Executive Summary

This report provides feedback on Berkeley Police Department (BPD) data on vehicle stops, pedestrian stops, and reported use of force. BPD shared these data with CPE as part of its National Justice Database (NJD). This report presents descriptive statistics and inferential analyses with respect to vehicle stops conducted from 2012 through 2016, pedestrian stops conducted from 2015 through 2016, and use of force reported from 2012 through 2016.

Our analysis of BPD vehicle and pedestrian stops found that Black and Hispanic persons were more likely than White persons to be stopped by BPD. Black persons in Berkeley were about 6.5 times more likely per capita than White persons to be stopped while driving, and 4.5 times more likely to be stopped on foot. Hispanic persons were about twice as likely, per capita, as White persons to be stopped while driving, and slightly less likely to be stopped on foot.

In addition to their much higher stop rates, Black and Hispanic drivers (and pedestrians) were also searched at much higher rates. Once stopped, Black drivers were searched at a rate four times higher than their White counterparts (20% compared to 5%), while Hispanic drivers were searched at three times the White rate (15%). Search-rate disparities were similar among White, Black, and Hispanic pedestrians. The higher rates at which Black and Hispanic drivers and pedestrians were stopped and searched are consistent with the possibility that Black and Hispanic persons were treated with greater suspicion by BPD officers.

Because they were stopped at higher rates and were more likely to be searched once stopped, Hispanic persons in Berkeley are, per capita, 4.5 times more likely to be searched by BPD officers than White persons are, and Black persons in Berkeley are 20 times more likely to be searched by BPD.

Nonetheless, Black and Hispanic persons who are searched are *less* likely to be found committing a criminal offense than their White counterparts are. Searches of Black individuals yield arrests only half as often as searches of White individuals do; searches of Hispanic individuals yield arrests 39% less often than searches of White individuals do. (Because BPD does not track data about whether contraband was found during searches, arrest was used as a proxy measure of whether a search uncovered criminal behavior.) Nonetheless, because they are stopped so much more often, Black and Hispanic persons are arrested at much higher per capita rates than Whites are.

Racial disparities in stops, searches, and arrests can be attributed to at least two competing, but not mutually exclusive, possible explanations: a community-level explanation (e.g., crime rates), and a policing-level explanation (e.g., officer discretion). The community-level explanation could posit that the higher stop, search, and arrest rates of Black and Hispanic drivers (compared to Whites) reflect higher levels of traffic violations and/or criminal behavior among such drivers. This hypothesis, however, cannot explain our findings with respect to Asian-American drivers: they are stopped less frequently than Whites, are searched at the same rate

once stopped, but are arrested at three times the rate of White drivers. BPD searches appear to be more effective at detecting criminal wrongdoing by White and Asian persons, yielding a higher proportion of arrests of White and Asian persons without searching as many innocent people in those groups.

Another finding that is inconsistent with the community-level explanation is that Black and Hispanic drivers are much more likely than White drivers to be stopped and searched, but much *less* likely to be arrested after a search. That is, Black and Hispanic drivers who are searched are more likely to be innocent than White (and Asian-American) drivers who are searched. It is unclear whether, if Black and Hispanic drivers were stopped and searched at the same high rate of suspicion that seems to be applied to their White and Asian-American counterparts (that is, if they were stopped and searched as infrequently as White or Asian-American drivers), searches of Black and Hispanic drivers might produce a yield rate as high as searches of White and Asian drivers do.

The policing-level explanation for these disparities might posit that stop, search, and arrest decisions could all reflect discretionary decision-making that operates differently on drivers of different races. The higher overall rates of stop, search, and arrest of Black and Hispanic drivers could reflect a pattern of policing discretion that is less forgiving of minor crime. Our findings are consistent with the possibility that Black and Hispanic drivers might face criminal charges in circumstances where a White driver might have received only a citation. Despite their lower rate of arrest *after a search*, Black drivers stopped by BPD are overall twice as likely as White drivers to be arrested, and they are half as likely as White drivers to receive a citation without being arrested. Without information about the charges that are filed at vehicle stops, neither the policing-level nor the community-level explanation should be uncritically accepted.

Unexplained disparities were also observed in BPD use of force. Black people, who comprise only 8% of the population of the City of Berkeley, made up 46% of individuals who were subjected to use of force by BPD. Compared to White individuals in Berkeley, Black individuals were nine times more likely per capita to have force used upon them. Our analyses found that these disparities are not explained by poverty, neighborhood crime rates, or neighborhood demographics, and are not attributable to chance. These disparities, like the disparities in BPD pedestrian and vehicle stops, are unexplained, and warrant further investigation.

It is likely that both community-level and policing-level factors may contribute to the racial disparities observed in BPD stops, searches, and use of force; the collection and analysis of data about the charges filed at vehicle stops and after use of force incidents might help to illuminate the relationship between the two.

Overall, our findings revealed reasons for optimism, as well as opportunities for improvement. Reasons for optimism included BPD's overall number of reported use of force incidents. BPD's rate of reported use of force incidents compares favorably to other departments of similar size, although BPD policy does not require comprehensive reporting of weaponless hands-on force. Despite a policy that does not appear to require that every weaponless hands-on force incident

be reported, a large majority of force incidents reported by BPD officers involved no weapon other than the officer's hands or body. Together, these findings may be consistent with a culture of restraint within BPD with respect to use of force. Racial disparities in arrests and citations at pedestrian stops are also fairly small, and the Black-White racial disparity in vehicle stops declined slightly between 2012 and 2016 (but it remained large, and was accompanied by a moderate increase in disparities affecting Hispanic, Asian-American, and Other groups).

Another notable finding could be read as reason for either optimism or concern. The percentage of BPD vehicle stops resulting in arrest increased nearly sixfold across the observation period, from 0.7% in January 2012 to 4.1% by November 2016. Most of this increase occurred in 2015 and 2016. This could be read as reason for optimism, in that BPD vehicle stops have become more effective at detecting crimes that warrant arrest. Or, if it indicates that BPD officers have begun making discretionary arrests in circumstances that might previously have been addressed by only a citation, it could be read as reason for concern. The increase in arrest rates warrants analysis to identify the causes and consequences of this increase. This analysis could be enhanced by collection and analysis of data about charges filed at vehicle stops.

The unexplained racial disparities in BPD stop and search rates and in use of force offer additional opportunities for improvement. The Black-White racial disparity in use of force is a matter of special concern, as it appears to have increased between 2012 and 2016, and is not explained by factors such as neighborhood poverty, crime rate, or demographics. These disparities warrant further analysis and attention.

The presentation and analysis of observed racial disparities in this report is limited by the data that BPD collects and shares with researchers. Several of our most important recommendations concern the importance of increased data collection and analysis, which will, in turn, enable more accurate and effective initiatives toward reform and accountability. The disparities identified in this report could be better understood and addressed by changes including the collection and analysis of data with respect to contraband found in searches at police stops; comprehensive data regarding BPD use of force; and charges filed against persons who are stopped by BPD or subjected to force.

In this report, we advance thirteen specific recommendations. While not an exhaustive list of possible solutions to the issues raised in this report, these thirteen recommendations represent straightforward first steps toward addressing each of them.

Recommendations

1. We recommend changing the use of force data capture protocol to register every use of force by BPD officers, regardless of weapon use, injury, or complaint.
2. We recommend that BPD monitor search and disposition outcomes across race, and arrest and disposition outcomes associated with use of force. In particular, BPD should collect and share data with respect to contraband (distinguishing among drugs, guns,

non-gun weapons, and stolen property) found during vehicle or pedestrian searches, and that it analyze data about charges filed resulting from vehicle and pedestrian stops.

3. We recommend that BPD collect and share more detailed data with respect to use of force. In particular, we recommend that it collect and analyze data about whether the and how the person resisted arrest, and about charges filed against persons involved in use of force incidents.
4. We recommend that BPD more clearly track, analyze, and share data with respect to whether law enforcement actions are officer-initiated, or responses to calls for service.
5. We recommend that BPD continue to affirm that the egalitarian values of the department be reflected in the work its officers and employees do.
6. We recommend that BPD consult and cooperate with the broader Berkeley community, especially those communities most affected by observed racial disparities, to develop and implement policy and practice reforms that reflect these shared values.
7. We recommend BPD track yield rates (of contraband found at searches).
8. We recommend that BPD monitor patrol deployments, using efficient and equitable deployment as a metric of supervisory success. One way to promote equitable contact rates is to monitor racial disparities (not attributable to non-police factors such as crime) and to adjust patrol deployments accordingly.
9. We recommend that BPD track crime trends with neighborhood demographics in order to ensure that response rates are proportional to crime rates.
10. We recommend that BPD engage in scenario-based training on the importance of procedural justice and the psychological roots of disparate treatment in order to promote the adoption of procedural justice throughout the organization, and to protect officers from the negative consequences of concerns that they will appear racist.
11. We recommend that values-based evaluations of supervisors be developed to curb the possible influence of social dominance orientation on the mission of the department. CPE research has found a significant relationship between social dominance orientation and negative policing outcomes in many police departments.
12. We recommend that BPD trainings include clear messaging that racial inequality and other invidious disparities are not consistent with the values of BPD.
13. We recommend leveraging the Police Review Commission, as well as ensuring inclusion from all groups in the community, to help review relevant areas of the general orders manual and provide a more integrated set of policies with clear accountability and institutional resources.

While not an exhaustive list of possible solutions to the issues raised in this report, these thirteen recommendations represent straightforward first steps toward addressing each of them.

History of City Involvement in the National Justice Database Project

In this section, we describe how the relationship between BPD and CPE began, and why BPD chose to participate in the National Justice Database.

The City of Berkeley is home to one of the nation's leading research universities, and is renowned as a bastion of liberal values and egalitarian culture. Over the past decade or so, the current and prior leadership of BPD have implemented their commitment to equitable policing by introducing multiple policy and training initiatives designed to reduce racial disparity and bias. These initiatives have included enhanced data collection, a "fair and impartial policing program," anti-racial-profiling training, and crisis intervention training to prepare officers to deal with people in mental health crisis, and the public posting of stop data on an open data portal. The current police Chief, Andrew Greenwood, has been leading the department since October 2016, and has committed to "building community trust" as one of the primary goals of his leadership.

Nonetheless, BPD has not been immune to allegations of racial inequity nor excessive force. Like many other urban police departments, BPD has faced litigation and experienced criticism from Berkeley residents who raise concerns about racial disparities, use of force in response to protests, and relationships with LGBTQ communities. CPE hopes that the empirical findings of this report can assist BPD and the people of Berkeley to analyze and address these and other police-community concerns.

In 2015, CPE began working with BPD on a comprehensive data analysis plan, but limited data were provided to the researchers. When Chief Greenwood was appointed Interim Chief, he vowed to provide more comprehensive data, asking to broaden the scope of the study to include analysis of BPD use of force data. Data-sharing efforts grew rapidly, and researchers completed their data collection in February 2017. Analysis continued from there, and an interim report was delivered in May 2017. Additional, more varied data has now been provided, and is included in this final report.

After reviewing the 2017 interim report, Chief Greenwood decided that, rather than publicizing the Interim Report, he would wait for CPE to produce a final report. Chief Greenwood has continually committed to CPE to provide the most current and comprehensive data possible, reflecting his stated interest in CPE's final report serving as a milestone from which community discussion about race and disparity in police interactions will flow. The Department has provided invaluable support to assist CPE with the review and interpretation of data from BPD systems. Despite the many other claims on the time of Departmental staff and leadership, BPD has remained responsive to CPE requests for data and interpretation throughout this study.

We note that the Department's formal mission statement was completely revised at the end of 2016. The new statement emphasizes treating diverse community members with dignity and respect, focuses on safe-guarding the community, and includes Diversity among the Department's five core values, along with Integrity, Respect, Safety, and Professionalism. Social Media use was expanded. As a result, in 2017, BPD actively focused on strategies for building trust and community engagement. The Chief held large-scale community forums and now holds regular community engagement activities such as Coffee-with-a-cop.

The Department also expressed its support of the LGBTQ community during Pride month 2017, including the Department's first-ever formal participation in the SF Pride Parade. The Department is also finalizing a body-worn camera program, and anticipates Department-wide implementation in mid-2018.

The current report now includes data from 2012 through 2016 and contains analysis of BPD stop and force data as well as a series of recommendations that, CPE hopes, can assist BPD in building on its strengths and addressing the concerns raised by our findings.

Section 1: Data

In this report, we focus on two sets of BPD data made available through the NJD: vehicle stops between 2012 and 2016, pedestrian stops between 2015 and 2016, and reported incidents of police use of force between 2012 and 2016. This section sets out total counts for both sets of data as they affect persons of Asian-American, Black, Hispanic, White, and Other or unknown ethnicity.

The BPD employs approximately 170 sworn officers and another 100 civilian employees, serving a city of approximately 118,585 people. According to the American Community Survey population estimate for 2016, the racial distribution of the City of Berkeley is as follows:

- 55.5% of Berkeley residents are non-Hispanic White (“White”);
- 11.1% are Hispanic or Latino;
- 8.2% are non-Hispanic Black (“Black”);
- 19.1% are non-Hispanic Asian (“Asian-American”);
- 5.2% identify with multiple racial categories; and
- Less than 1% identify as non-Hispanic American Indian/Alaska Native, non-Hispanic Native Hawaiian/Pacific Islander, or non-Hispanic “Some other race.”

BPD is also home to the University of California Berkeley campus. During the time of this data collection, it was home to about 35,000 students (about 25,000 undergraduates and nearly 10,000 graduate students). Of these students—most but not all of whom live in the City of Berkeley—about 31% identify as White, 34% identify as Asian, 11% identify as Chicano/Latino, 3% identify as African-American, and less than 1% identify as each of Indigenous or Pacific Islander.⁴ That is, the population of the campus is less African-American, less White, about as Hispanic, and more Asian-American than the population of the City of Berkeley itself.

BPD policing data must be understood in context: In Berkeley, as in any other police department, it cannot be assumed that all the persons with whom the department’s officers interact are necessarily residents of the jurisdiction served by BPD, nor of the neighborhood in which an encounter takes place. Nonetheless, jurisdiction-wide and neighborhood demographics provide the best available benchmarks for sketching the demographic outlines of the population from which people who interact with police are drawn.

Racial differences in policing data must also be contextualized with other contributing factors, including neighborhood characteristics, crime rates, and other factors modeled in the regression analyses presented in this report.

⁴ Source: University of California Berkeley Office of the Vice Chancellor for Equity and Inclusion, Diversity Snapshot (Fall 2013), Tables 1 and 2, at <https://diversity.berkeley.edu/sites/default/files/diversity-snapshot-web-final.pdf>.

Data Provided

This section describes the data BPD provided to CPE for analysis. It also identifies a few sources of information that might have facilitated more rigorous analyses, but were not included in the datasets shared with CPE, or could not be analyzed in the time available to prepare this report, and recommends more comprehensive data collection practices in the future.

BPD provided data from the following categories:

- Call for service (374,849 cases from January 1, 2012 through December 31, 2016)
 - The data contained the following fields: incident number, id number, create date, year, call source, call type, priority, @1st unit dispatch time, address, address location type, latitude, longitude, stop disposition note, disposition code type, disposition codes for up to 7 persons, number of persons, pedestrian stop indicator, vehicle stop indicator, reason for stop code.
 - We used “call type” to determine which of these represented pedestrian or vehicle stops.
 - There was data for 40,594 vehicle stops.
 - There was data for 3,010 pedestrian stops, but only 32 during 2012, 27 during 2013, and 44 during 2014; we analyzed the more complete data from 2015–2016.
- Use of force data from January 1, 2012 through December 31, 2016 (174 incidents; one incident was dated as having occurred during 2010 and was removed); subject race data was missing for 2 incidents; 2 incidents occurred outside the city of Berkeley 10 incidents could not be geo-located to a census tract.
 - The data contained the following fields: unique id, date, time, day, nature of contact, disposition/subj arrest, force reason, officer injured, officer hospitalized, officer department years, officer age, officer race, officer sex, subject date of birth, subject race, subject sex, subject hospitalized, subject injured.
- Crime report data from January 1, 2012 through December 31, 2016 (416,649 crimes reported to BPD)
 - These data contained the following fields: case number, reported date, address, location type, latitude, longitude, officer id number, incident type, statute, statute type, crime code, statute description, UCR return a code, location/scene, bias motivation, case subject type victim, jacket type, age, race, sex.
 - We used crime data in multiple regression analyses predicting use of force incidents by race. For these analyses, we selected crimes that were in the Part 1 crime category using the “offense” indicator; we selected crimes from 2012 to 2016 to match the timeframe of use of force data. Because the overwhelming majority of use of force incidents involved persons who were Black (47%) OR White (35%), we analyzed those incidents to more directly assess the hypothesized relationship between racial differences in use of force and crime.

Data Not Provided

Much of the racial analysis in this report focuses on results for Black and White individuals, who together account for the great majority of stops (69%) and use-of-force incidents (82%). Although Asian-Americans comprise nearly one fifth of the Berkeley population, they account for relatively few vehicle stops (9% of the total), pedestrian stops (4%), or recorded use-of-force incidents (3%). Statistics for groups with smaller numbers tend to be “noisier” (that is, they fluctuate more over time because of random chance) than statistics with larger groups of observations (e.g., stops or force incidents involving White or Black people).

A Note on Racial Disparities in Berkeley

The charts and analyses in this report show evidence of racial disparities in policing. Two important caveats should be kept in mind when evaluating these statistics. The first urges caution about drawing conclusions based on local population data. The second involves the limitations of causal inference.

Firstly, our methodology for measuring racial disparities is based on an assumption about the size of the underlying population of each racial group. If a racial group comprised 10% of the city’s population but accounted for 30% of the traffic stops in the city, this difference could—but does not necessarily—indicate racial disparity in traffic law enforcement. The caveat is this: not all people who interact with BPD officers will be residents of Berkeley or of the neighborhood in which they were stopped. Data shared with CPE does not identify whether persons who were stopped were residents of Berkeley or not. Because people driving or walking in Berkeley at any given time may come from other neighborhoods, towns, states, or countries, their demographics may not precisely reflect the demographics of Berkeley. We cannot know, for example, whether miles driven or walked differ between racial groups. It is impossible to estimate with precision what the racial distribution of police encounters might be if race were not a factor.

At this time, census data provides the best available benchmark for analysis of police stops and use of force, as there is no other reliable way to benchmark the effective representation of each racial group among persons with whom BPD officers may interact. As a result, census-based comparisons are essential, but should be interpreted with caution.

The second caveat is that, even if all police encounters reported by BPD officers involved residents of Berkeley, observed disparities would not necessarily indicate that police officers have engaged in biased or discriminatory behavior. We cannot know, for example, the racial distribution of drivers or pedestrians who engage in behaviors (e.g., infractions) that might result in a police stop or in use of force. There is also no reason to believe that racial disparities observed in law enforcement are isolated from disparities in education, housing, employment, wealth, home ownership, healthcare, or any other factors that may influence the trajectory of

people before they ever come into contact with an officer. The statistical analyses presented in Parts II.C and III.B are designed to assess such complex relationships, but this caution should be kept in mind when interpreting the observed disparities presented in this section.

Section II: Racial Disparities in Vehicle and Pedestrian Stops

In this section, we present a descriptive analysis of vehicle stop, pedestrian stop, and use of force data that BPD shared with CPE through the National Justice Database. This section presents counts of vehicle stops, pedestrian stops, and use of force, both for the department as a whole and by race/ethnicity. This section categorizes race/ethnicity using the categories used by BPD: Asian, Black, Hispanic, White and Other/unknown. Subjects in the Hispanic category could be of any race.

Section 2A presents the total number of vehicle stops, the number of vehicle stops at which a citation is issued or an arrest is made, the racial distribution of such stops and outcomes, and the “yield rate”—that is, the likelihood that a search yield an arrest—for different racial groups. Section 2B presents the total number of pedestrian stops, the number of pedestrian stops at which a citation is issued or an arrest is made, the racial distribution of such stops and outcomes, and the yield rate for pedestrian searches.

Section 2A: Racial Disparities in Vehicle Stops

This section presents information extracted from BPD’s vehicle stop data for January 2012 through December 2016. It presents aggregate vehicle stop trends over time, noting the overall numbers of stops, citations, and arrests. It then presents stop and outcome data disaggregated by race, overall and as compared to the population of Berkeley, and analyzes the “yield rate” for BPD vehicle searches (using arrest rate as a rough proxy for contraband found).

It should be noted that 7% of all vehicle stops recorded by Berkeley officers occurred outside the City of Berkeley. These incidents are excluded from the inferential analyses presented in this report. A table showing the geographic and racial distribution of these incidents is attached to this report at Appendix A. Of the 2,728 out-of-jurisdiction BPD vehicle stops, 73% occurred in Oakland, 21% in Emeryville, 5% in Albany, and 1% in Kensington. The racial disparity in these stops was higher than that observed in stops within Berkeley: 58% of persons stopped outside Berkeley were Black, 21% were White, 10% were Hispanic, 7% were Other, and 4% were Asian-American. CPE has not received information about any enforcement agreements between Berkeley and the adjoining cities, and received no data indicating whether these incidents involved a pursuit.

Summary of findings:

Across the observation period (2012-2016), the number of vehicle stops by BPD increased moderately. Throughout the observation period, Black drivers were stopped by BPD at rates that could not be explained by reference to their share of the population: Black people comprise 8% of Berkeley residents, but made up the largest group (36%) of drivers stopped by

BPD. Using population as a benchmark, Black drivers were much more likely (6.5 times more) than White drivers to be stopped by BPD. Over the five-year observation period, the total number of Black drivers stopped by BPD was 14,441, which is nearly 150% of the entire non-Hispanic Black population of Berkeley (9,737 people, including children). By comparison, the total number of White drivers stopped was 13,166, which is 20% of the non-Hispanic White population (65,771, including children).⁵ A Black adult driver would face a likelihood of being stopped more than once in Berkeley between 2012 and 2016, while it seems that most White drivers who reside in Berkeley would not have been stopped during this time.

Nearly half of White and Asian drivers who were stopped received a citation (without any arrest), compared to about a third of Hispanic drivers and a quarter of Black drivers.

Once stopped, Black and Hispanic drivers were much more likely than White drivers to be searched. Black drivers were four times more likely to be searched at a vehicle stop (20%) than White drivers were (5%); Hispanic drivers were three times more likely to be searched at a stop (15%). These disparities held true for Black, Hispanic, and White drivers in every age category. The least-stopped age group of Black drivers (those 40 years and older) was stopped more often than the most-stopped age group of White drivers (those under 18 years old). The collection, sharing, and analysis of data about whether contraband was found could help to determine whether drivers of different racial groups were searched at differing levels of suspicion.

The percentage of stops resulting in arrest showed a large increase from January 2015 to the end of the study period. Overall, less than 2% of vehicle stops resulted in an arrest. Arrest rates at vehicle stops were much higher for drivers who were described as Asian (2.5 times higher), Hispanic (80% higher), or Black (70% higher) than for stopped drivers who were White.

⁵ Source: United States Census Bureau, American Community Survey Demographic and Housing Estimates, 2012-2016 American Community Survey 5-Year Estimates, Berkeley City, California.

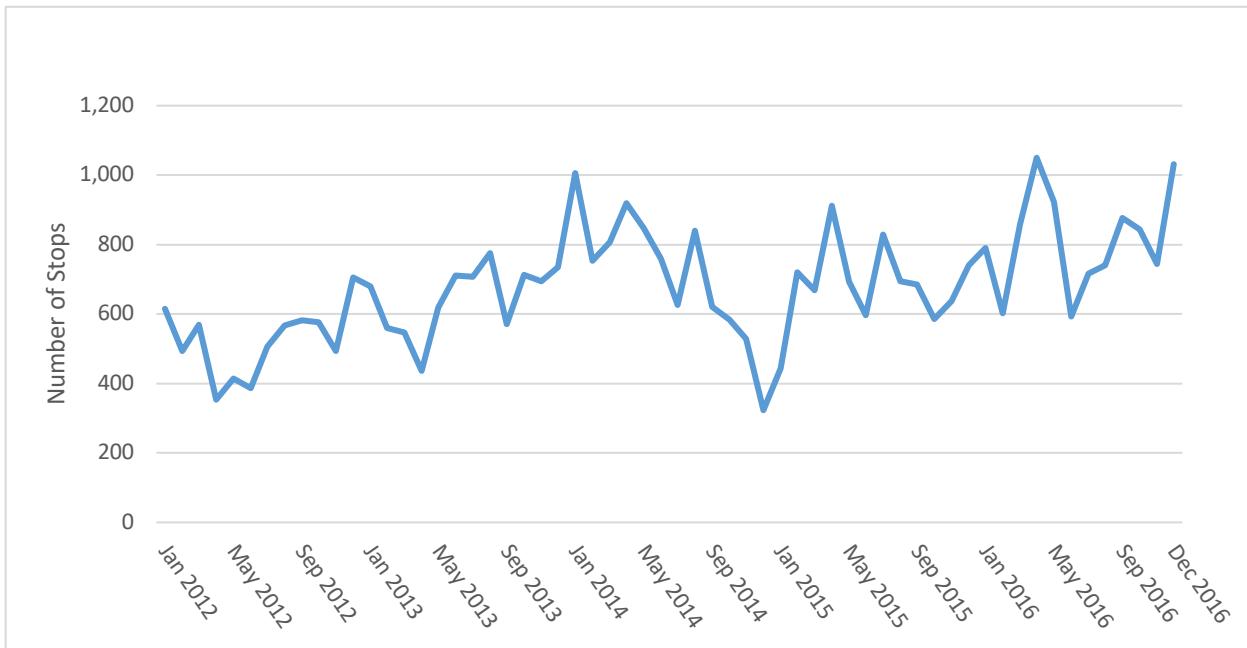
Figure 1. Vehicle Stops per Month, 2012-2016

Figure 1. This chart displays the number of vehicle stops recorded by BPD for each month of the observation period. The number of vehicle stops per month varied over time, with the fewest stops recorded in December 2014 and the largest number of stops recorded in April 2016. Overall, the trend line rose moderately upward, increasing 68% from the start to the end of the observation period.

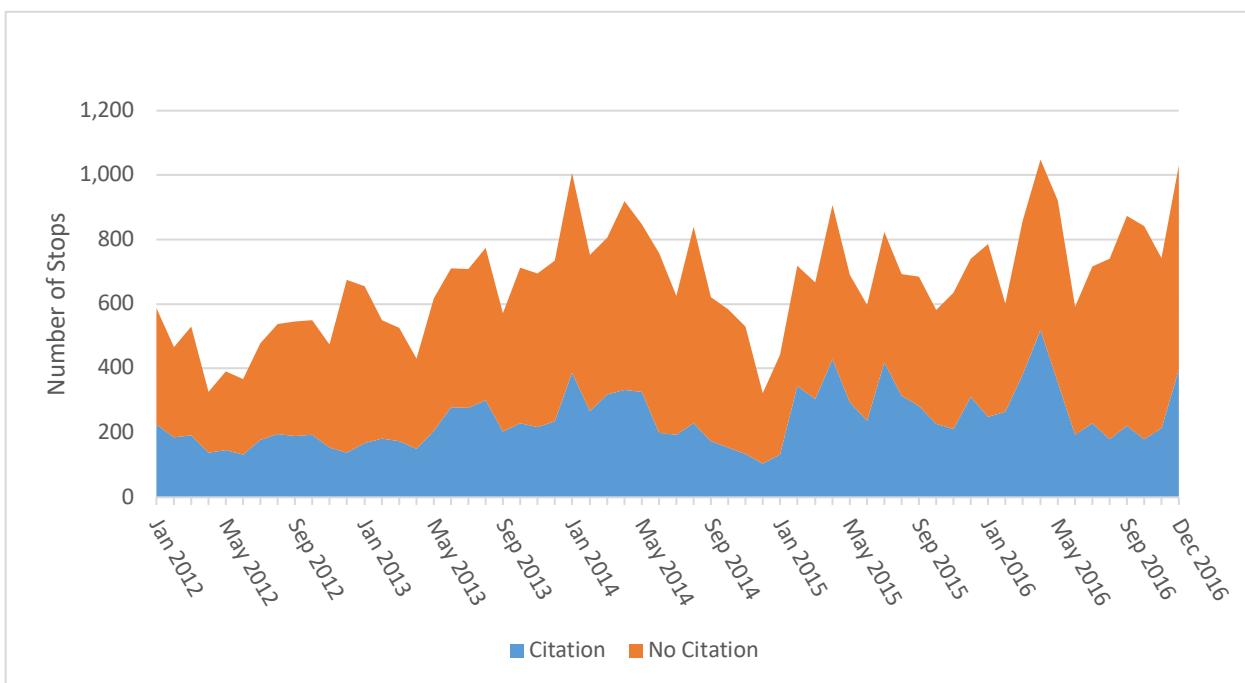
Figure 2. Number of Stops with and without Citations per Month, 2012-2016

Figure 2. This chart displays the number of vehicle stops by whether or not a citation was issued. The percentage of stops resulting in a citation ranged from 20.6% to 50.7% across the observation period, averaging 35.7% per month. Although the number of stops increased moderately over time (see **Figure 1**), the percentage of stops resulting in a citation was nearly the same for the first and last months of the observation period.

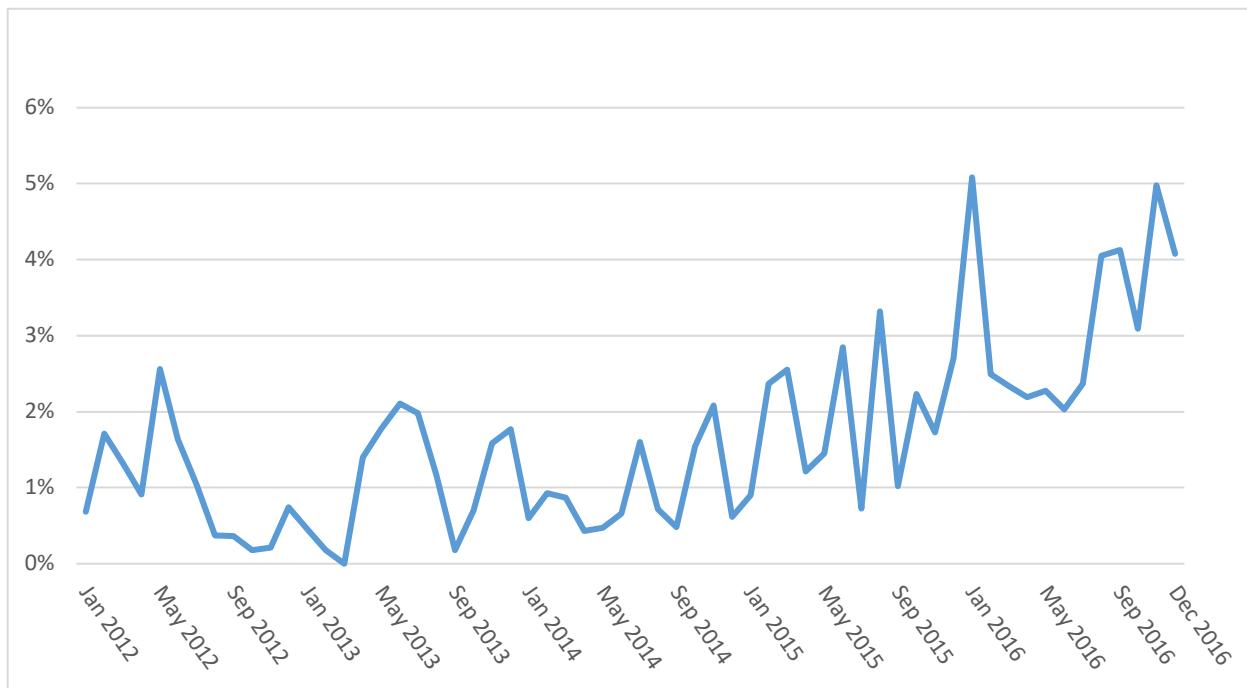
Figure 3. Percentage of Vehicle Stops with an Arrest, by Month, 2012-2016

Figure 3. This chart displays the percentage of vehicle stops at which an arrest was made. As is to be expected when the monthly number of arrests is low, the percentage varied considerably from month to month. A spike was observed in January 2016, when more than 1 in 20 vehicle stops (5.1%) resulted in arrest. The percentage of stops resulting in arrest averaged 1.6% across the observation period. From 2012 to 2014, the trend line was fairly flat, but a steep increase was observed from January 2015 to the end of the study period. The percentage of stops involving an arrest increased from 0.7% in January 2012 to 4.1% by November 2016.

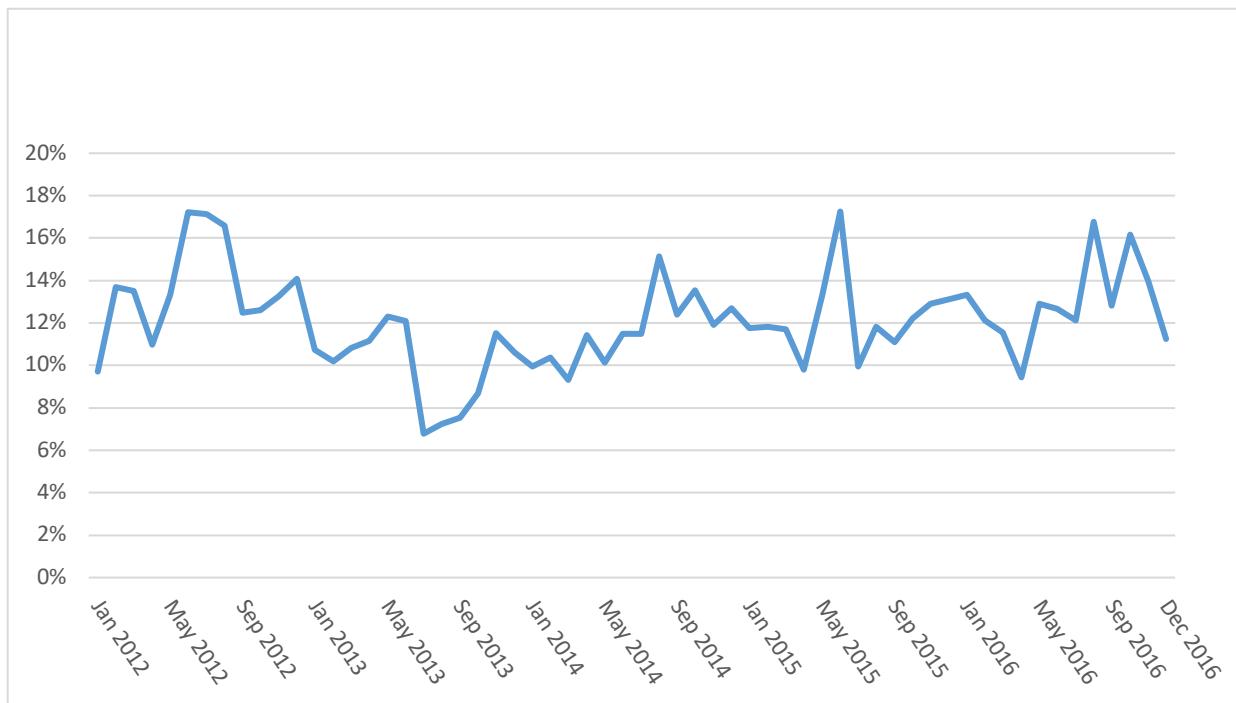
Figure 4. Percentage of Stops Involving Searches, per Month, 2012-2016

Figure 4. This chart displays the percentage of vehicle stops that involved a search. The search percentage varied over time, with the fewest searches per stop recorded in July 2013 (6.8%) and the most searches per stop in June 2015 (17.3%). Across the observation period, the percentage of stops involving a search increased slightly. Arrests were made in 12.1% of all stops.

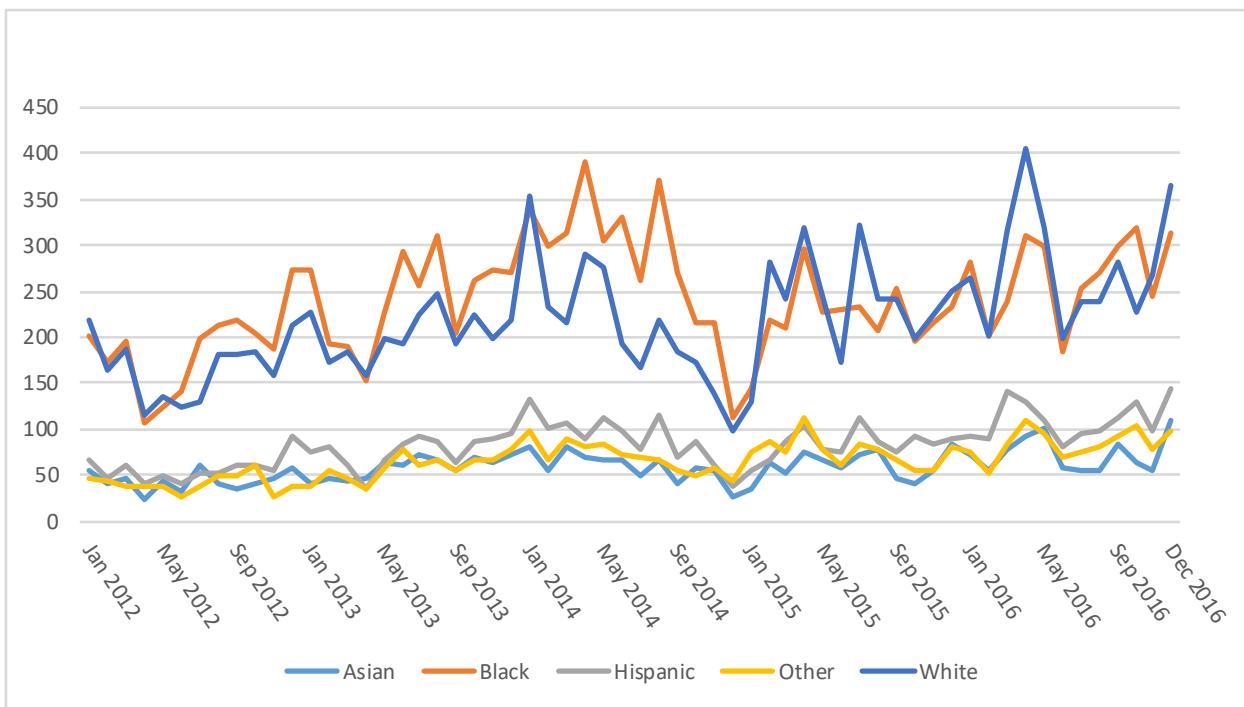
Figure 5. Number of Vehicle Stops per Month by Driver's Race, 2012-2016

Figure 5. This chart displays the number of vehicle stops per month by race of the driver. More than two thirds of BPD vehicle stops (about 69%) involved either White or Black drivers. Stops of Hispanic (13%), Asian-American (9%) and Other (10%) drivers accounted for the balance of BPD stops. Although the Berkeley population is about 56% white and 8% Black, BPD stopped a greater number of Black drivers than White drivers. 33% of BPD stops involved White drivers, while 36% involved Black drivers.

The number of vehicle stops increased greatly across the observation period for every racial group. The percentage increase from the beginning to the end of the observation period was somewhat greater for White drivers (67%) than for Black drivers (56%). Greater increases were observed for other groups of drivers (stops of Asian-American drivers increased 98%, stops of Other drivers increased 104%, and stops of Hispanic drivers increased 120%), but these numbers should be viewed with caution as statistics are “noisier” for groups that experience smaller numbers of stops.

Figure 6. Percentage of Stops Resulting in a Citation Without an Arrest, by Driver Race, 2012-2016

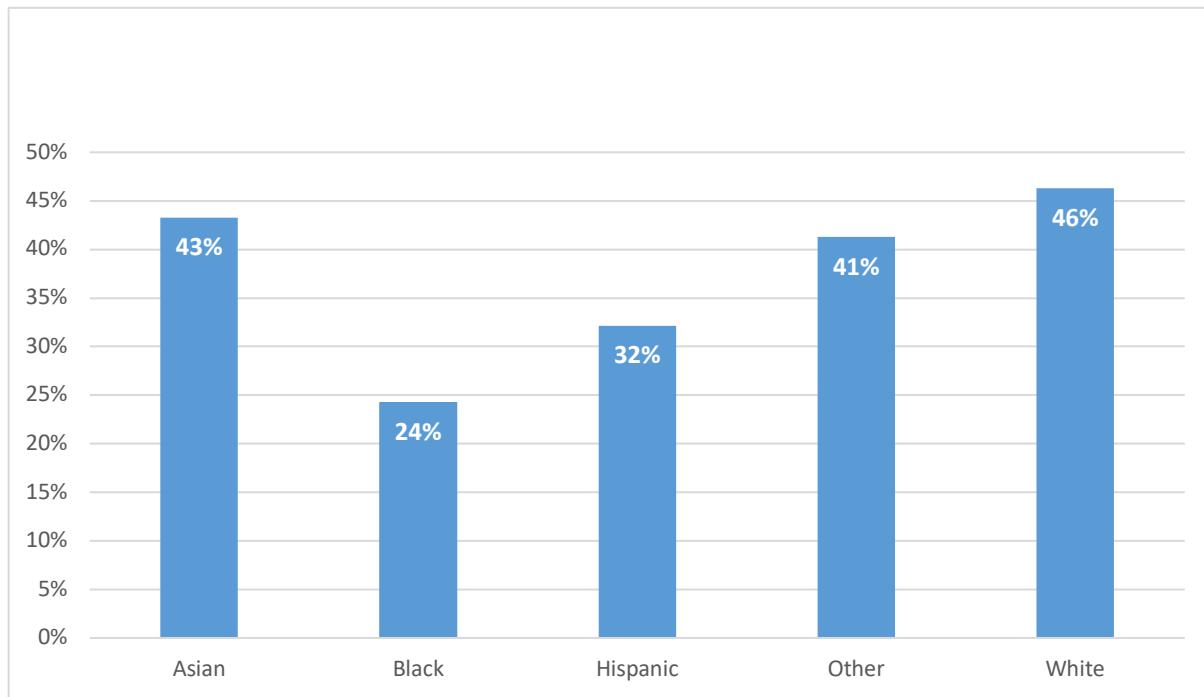


Figure 6. This chart displays the percentage of stops that resulted in a citation without an arrest, by race of the driver. Compared to stopped White drivers (46% of whom received a citation without being arrested), stopped Black drivers were about half as likely to receive a citation without arrest (24%). Stopped drivers who were described as Asian (43%), Other (41%) or Hispanic (32%) were slightly less likely to receive a citation than stopped White drivers were.

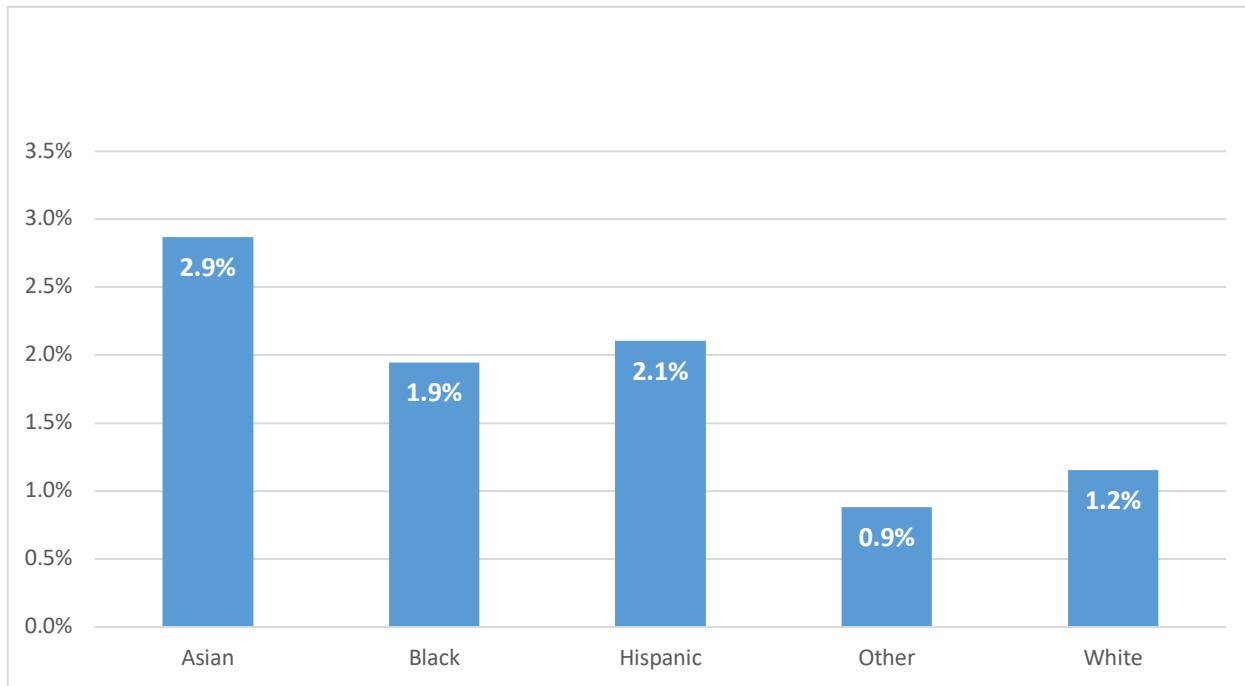
Figure 7. Percentage of Stops Resulting in an Arrest, by Driver's Race, 2012-2016

Figure 7. This chart displays the percentage of stops that resulted in an arrest, by race. 1.2% of White drivers who were stopped by BPD were arrested. Compared to stopped White drivers, stopped Asian-American drivers were more than twice as likely to be arrested (2.9%). Arrest rate disparities were also moderately high for Hispanic (2.1%) and Black (1.9%) drivers. Drivers in the “Other” racial category (0.9%) were slightly less likely than Whites to be arrested at a vehicle stop.

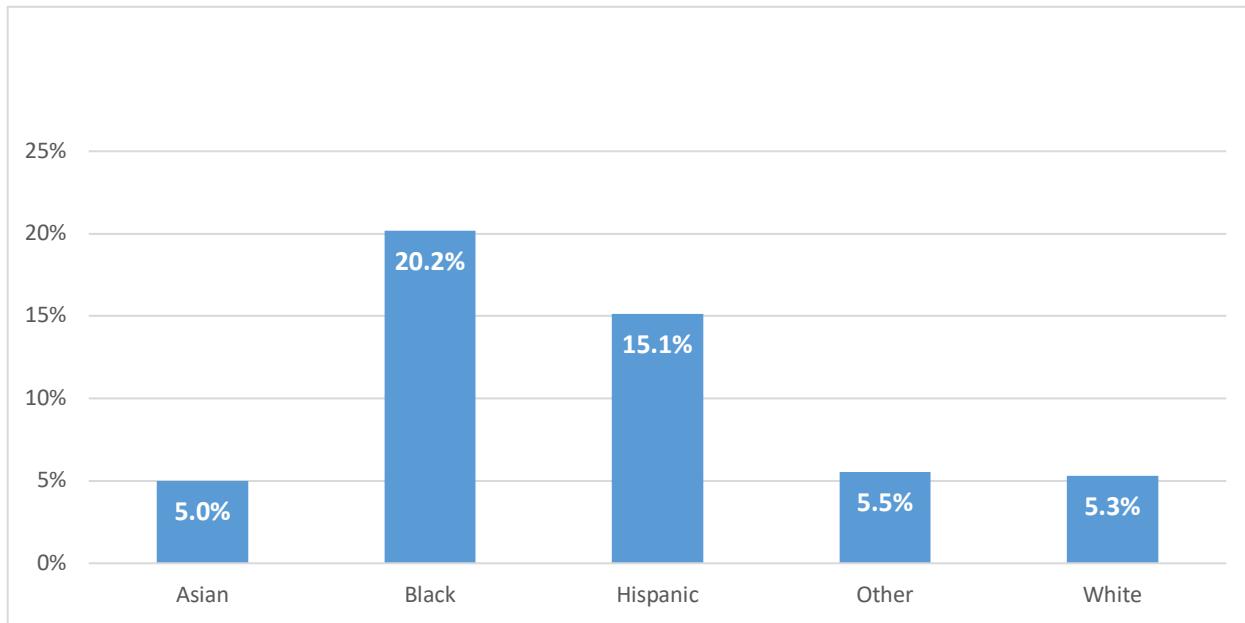
Figure 8. Percentage of Stops Resulting in a Search, by Driver Race, 2012-2016

Figure 8. This chart displays the percentage of stops that involved a search, by race of the driver. Compared to White drivers (5.3% of whom were searched at a vehicle stop), Black and Hispanic drivers were much more likely to be searched at a vehicle stop. Stopped Black drivers were nearly four times more likely to be searched than stopped White drivers, and stopped Hispanic drivers were more than three times more likely to be searched. Put another way, one in five BPD stops of a Black driver resulted in a search; one in seven stops of a Hispanic driver did; and one in 20 stops of a White driver resulted in a search.

Search rates for stopped drivers who were Asian-American or Other were similar to those for stopped White drivers.

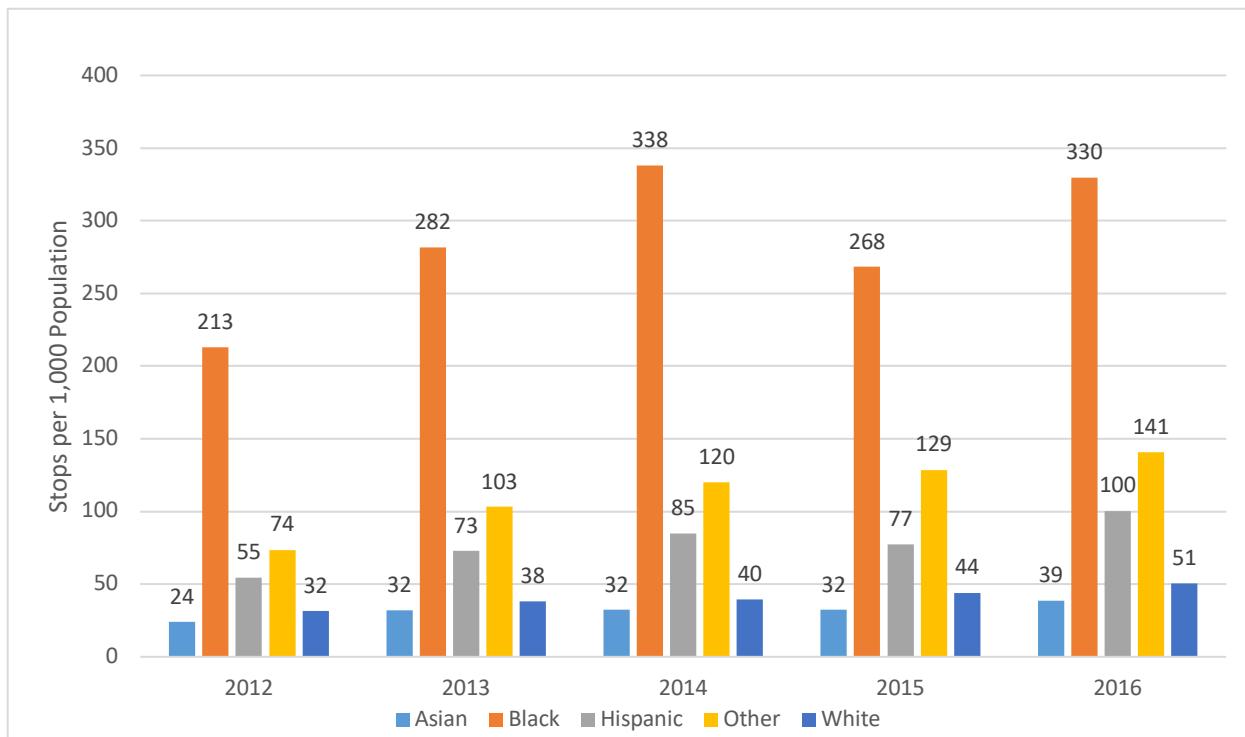
Figure 9. Vehicle Stop Rate per 1,000 Population, by Race, 2012-2016

Figure 9. This graph displays per-capita vehicle stop rates for each major racial group for each year of the study period. These rates were calculated by dividing the number of vehicle stops by census estimates of the number of Berkeley residents of the same racial group during this time period. (As noted above, the demographics of drivers in Berkeley may differ from the demographics of the City of Berkeley itself.) Per-capita vehicle stop rates showed wide disparities in every year of the study period. Compared to the per capita rate at which Whites were stopped while driving, Black drivers were 6.5 times more likely to be stopped, Hispanic drivers were twice as likely, and Other drivers were nearly three times as likely. Relative to population, Asian-American drivers were slightly less likely to be stopped than White drivers were.

Figure 10. Rate of Stops Resulting in a Citation without Arrest, by Race per 1,000 Population, 2012-2016

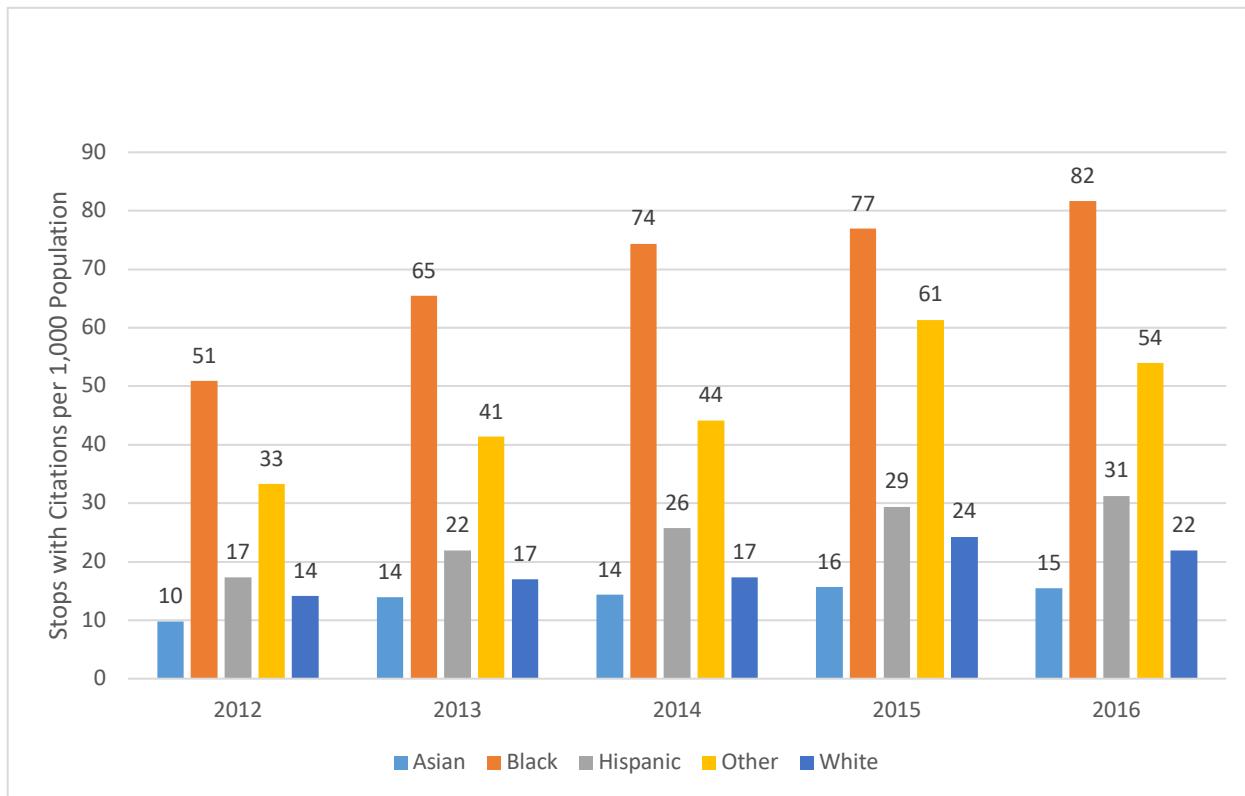


Figure 10. This graph displays the number of stops resulting in a citation per 1,000 residents of the same racial category. These rates were calculated by dividing the number of vehicle stops by census estimates of the number of Berkeley residents of the same racial group during this time period. Even though Black drivers received citations at about half the rate of White drivers (**Figure 6**), Black persons were stopped so much more often (**Figure 5**), and represent such a small proportion of the Berkeley population, that the per capita rate of citations at vehicle stops is much higher for Black than White drivers. On a per capita basis, Black persons were more than three times more likely to receive a citation while driving in Berkeley than White persons were, and Hispanic persons were 50% more likely than Whites to receive a citation.

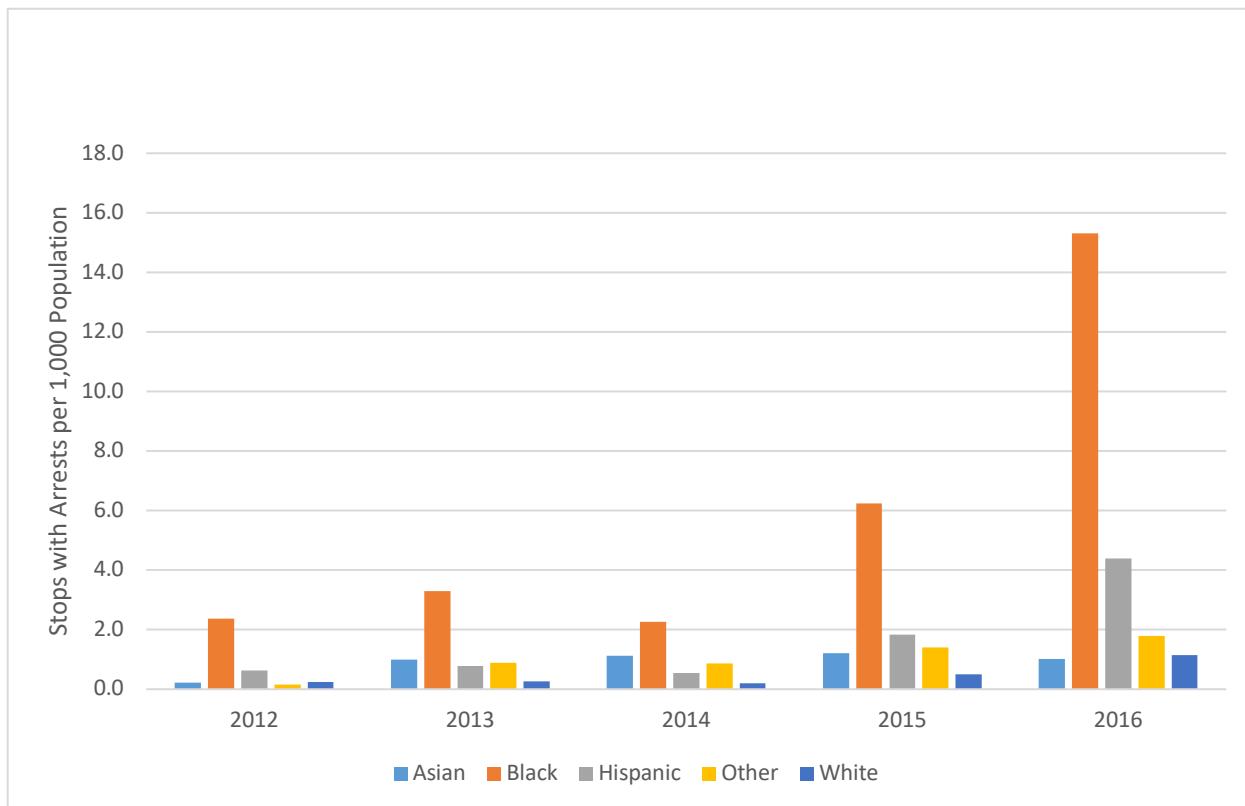
Figure 11. Rate of Stops Resulting in an Arrest per 1,000 Population, by Race, 2012-2016

Figure 11. This graph displays the number of stops resulting in an arrest per 1,000 residents of the same racial category. These rates were calculated by dividing the number of vehicle stops by census estimates of the number of Berkeley residents of the same racial group during this time period. On a per-capita basis, Black and Hispanic drivers were much more likely to be arrested at a vehicle stop than White drivers were. These disparities were evident in every year of the observation period, and they increased over time. By 2016, compared to their share of the Berkeley population, Black persons were more than 13 times more likely per capita than Whites to be arrested at a vehicle stop, and Hispanic drivers were nearly four times as likely.

Figure 12. Rate of Vehicle Stops Resulting in a Search per 1,000 Population, by Race, 2012-2016

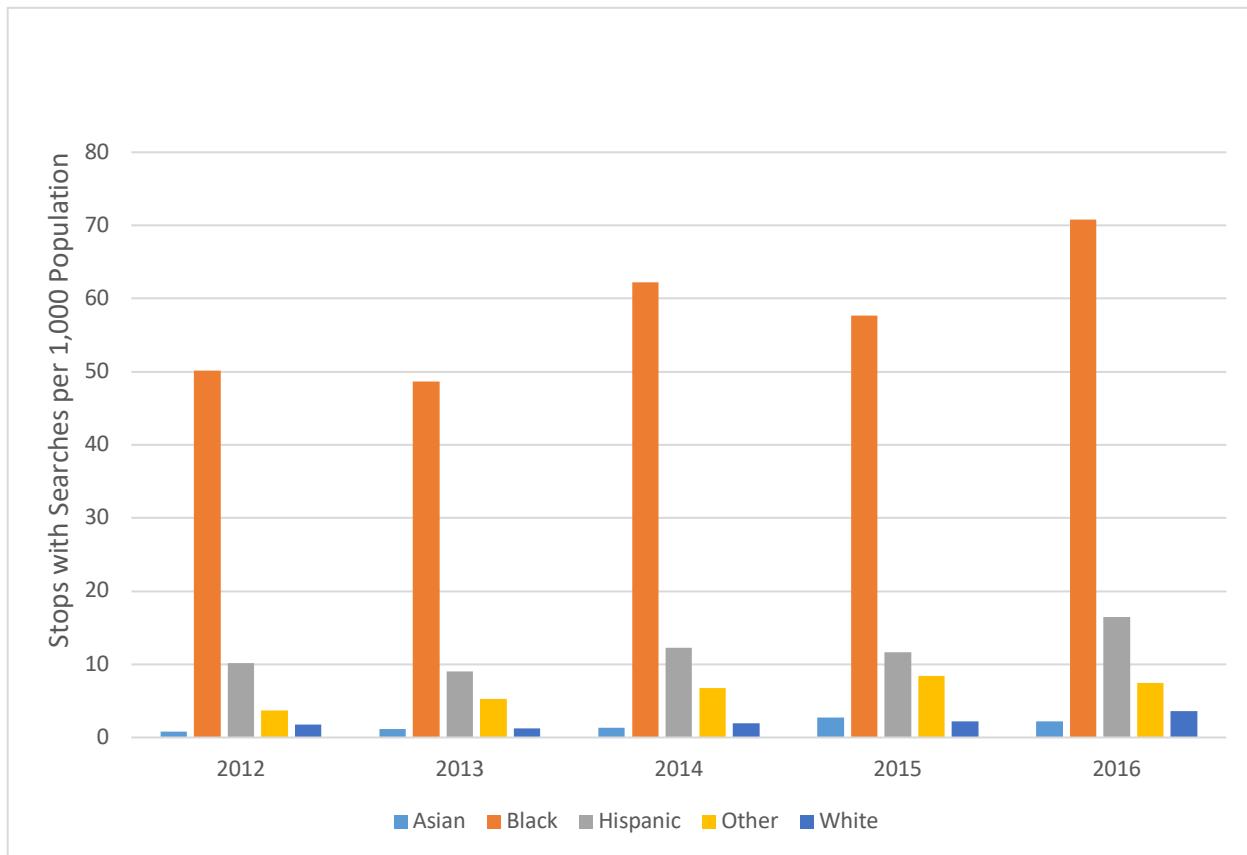


Figure 12. This graph displays the number of stops resulting in a search per 1,000 residents of the same racial category. These rates were calculated by dividing the number of vehicle stops by census estimates of the number of Berkeley residents of the same racial group during this time period. On a per-capita basis, Black and Hispanic drivers were much more likely to be searched at a vehicle stop than White drivers were: per capita, Hispanic drivers were searched at vehicle stops 4.5 times more often than Whites, and Black drivers were searched at nearly 20 times the per capita rate of Whites. These disparities were evident in every year of the observation period, and they increased over time.

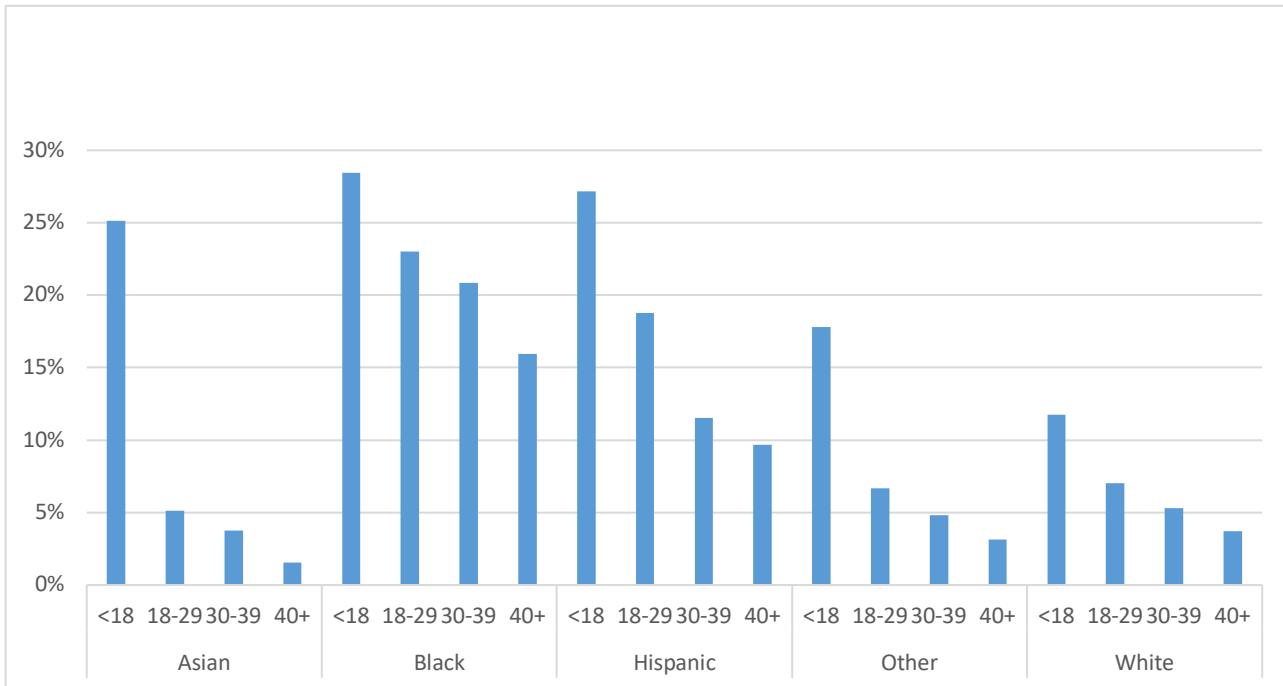
Figure 13. Percentage of Vehicle Stops Resulting in a Search, by Race and Age Group, 2012-2016

Figure 13. This graph displays the number of stops resulting in a search by race and age group. Within every racial group, drivers under 18 years of age were more likely to be searched, and the likelihood of a search decreased with age. However, the Black-White disparity was so large that even the oldest Black drivers were more likely to be searched than any age group of White drivers. Once stopped, 16% of over-40 Black drivers were searched, compared to only 12% of under-18 White drivers.

Within each age group, Black and Hispanic drivers were much more likely to be searched at a vehicle stop than were their White counterparts. For example, Black drivers under age 18 were 2.4 times more likely to be searched than White drivers the same age. The Hispanic-White disparity for the youngest drivers was nearly identical: Hispanic drivers under 18 were 2.3 times more likely to be searched. In the oldest age category (over 40 years old), disparities were even greater: Black drivers were 4.3 times more likely to be searched than their White counterparts, and Hispanic drivers were 2.6 times more likely to be searched.

Section 2B: Racial Disparities in Pedestrian Stops

This section presents information extracted from BPD's pedestrian stop data for January 2015 through December 2016. We begin by presenting aggregate pedestrian stop trends over time, noting the overall number of stops, citations, and arrests. This section then presents stop and outcome data disaggregated by race, then presents stop and outcome by race as compared to the population of the City of Berkeley.

It should be noted that 1% of all pedestrian stops recorded by Berkeley officers occurred outside the City of Berkeley. A table showing the geographic and racial distribution of these 36 incidents is attached to this section at Appendix A. CPE has not received information about any enforcement agreements between Berkeley and the adjoining municipalities, and received no data indicating whether these incidents involved a pursuit. These stops are not further analyzed in this report.

Summary of findings:

The average number of pedestrian stops recorded by BPD declined moderately across the study period. Black citizens, who comprise 8% of the City population, accounted for 33% of pedestrian stops. If they were stopped, pedestrians of all races were about equally likely to receive citations or to be arrested. But, compared to their White counterparts, Black and Hispanic pedestrians who were stopped by BPD were much more likely to be searched. The finding that stopped Black and Hispanic pedestrians were more likely than their White counterparts to be searched without being arrested may raise doubt about the utility of the higher search rate in detecting criminal behavior. Because they were 4.5 times more likely (per capita) to be stopped, Black pedestrians represented a disproportionately large number of citations and arrests.

CPE did not receive data from BPD regarding whether contraband was found in these searches. The collection, sharing, and analysis of data on contraband found could help to determine whether drivers of different racial groups were searched at differing levels of suspicion.

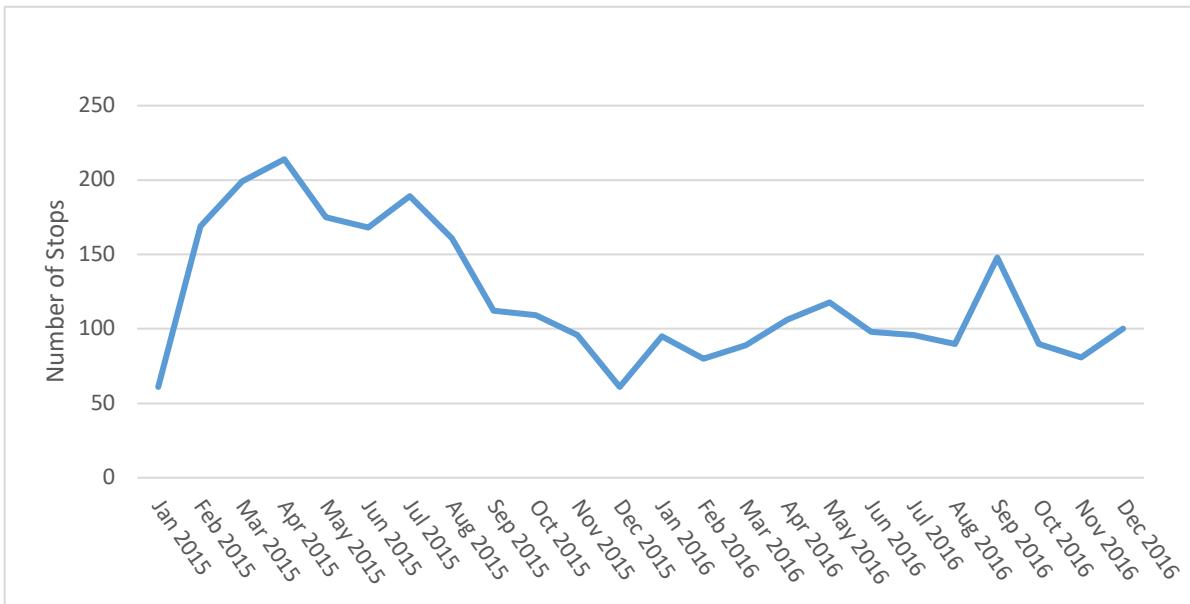
Figure 14. Number of Pedestrian Stops per Month, 2015-2016

Figure 14. This graph displays the number of pedestrian stops per month recorded by BPD during 2015 and 2016. After starting out at 61 per month in January 2015, the number peaked at 214 in April 2015. From the April 2015 peak, the number of pedestrian stops declined greatly (more than 50%) over the following seven months until it stabilized in December 2015 and held roughly steady through 2016 (with the exception of a smaller spike in September 2016).

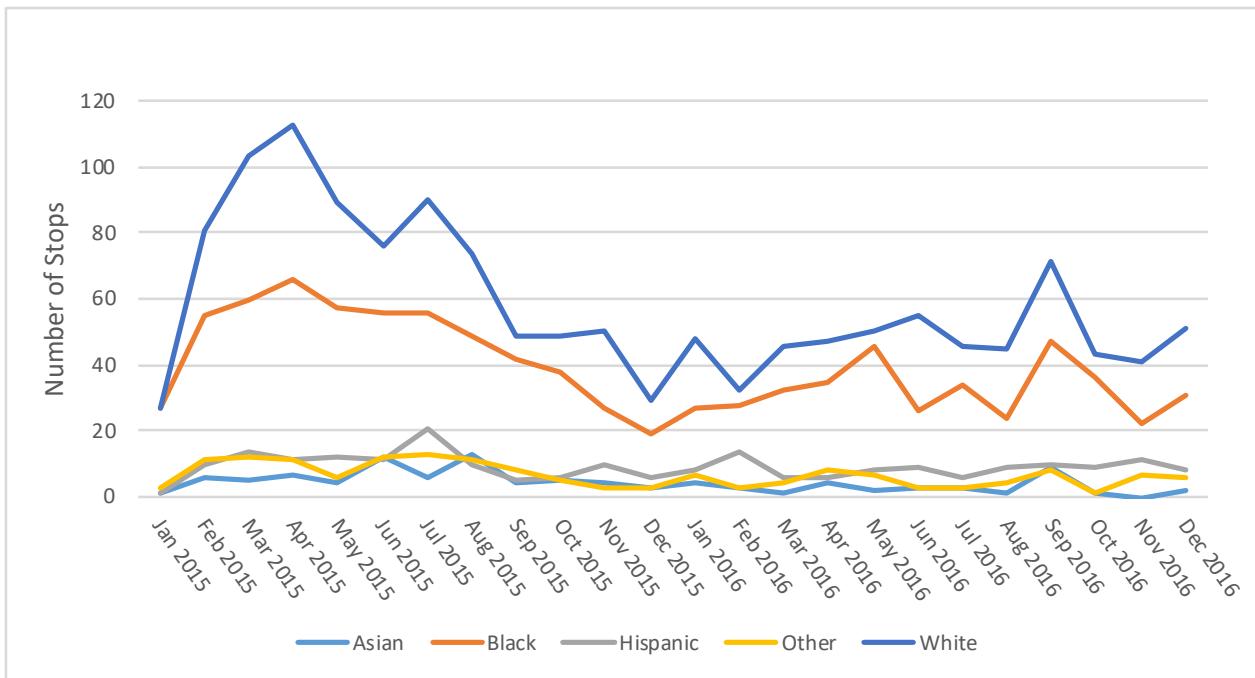
Figure 15. Number of Pedestrian Stops by Race and Month, 2015-2016

Figure 15. This graph shows the number of stops per month by racial group. As shown in Figure 14, the number of pedestrian stops was relatively low at the beginning of 2015, peaked during April 2015, dropped steeply, then stabilized (with a smaller peak in September 2016). White pedestrians were stopped more frequently than pedestrians of other racial groups. As with vehicle stops, however, stops of Black pedestrians were nearly as frequent as stops of White pedestrians, even though Black persons comprise only 8% of the Berkeley population, while White persons comprise 56%. Pedestrians described as Asian, Hispanic or Other were stopped at similar, low rates.

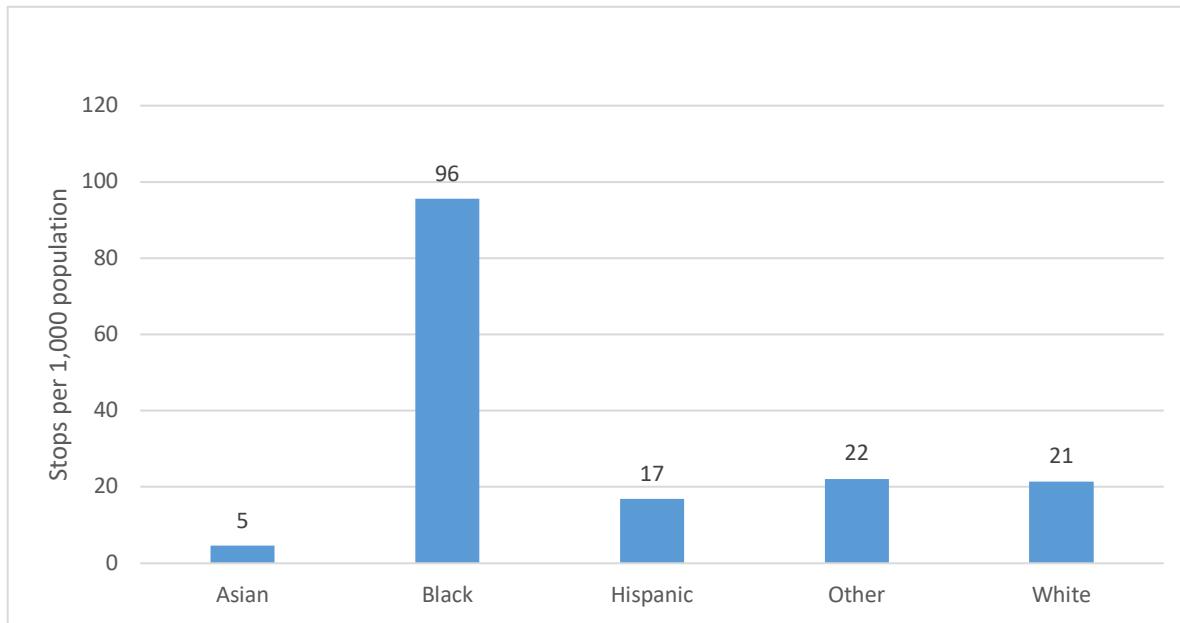
Figure 16. Pedestrian Stops per Capita by Race, 2015-2016

Figure 16. This graph displays per-capita pedestrian stop rates for each BPD racial classification, calculated by dividing the number of stops in each racial group by census estimates of the number of Berkeley residents of the same racial group during this time period. (As is noted above, the racial distribution of persons walking in Berkeley may differ from the population of the City of Berkeley itself.) Using this benchmark, Black pedestrians were much more likely to be stopped by BPD (4.5 times more likely) than White pedestrians were.

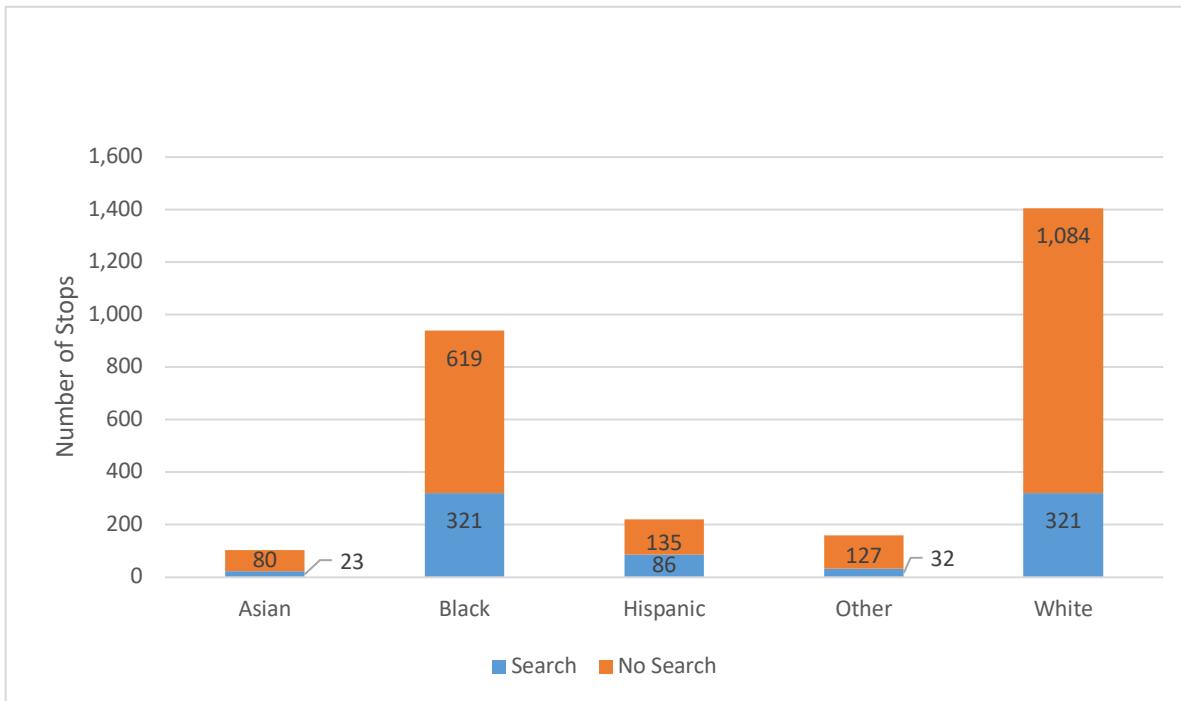
Figure 17. Number of Pedestrian Stops With and Without a Search, by Race, 2015-2016

Figure 17. This graph shows the number of pedestrian stops with and without a search, by racial group. The figure in the box above each bar indicates the percentage of stops that involved a search. More than one third of Hispanic and Black pedestrians who were stopped by BPD were searched, compared to less than a quarter of White pedestrians. Black pedestrians who were stopped were 49% more likely to be searched than White pedestrians. The number of Hispanic pedestrians who were stopped was much lower, but Hispanic pedestrians who were stopped were also much more likely—70% more likely—to be searched, compared to White pedestrians who were stopped. Search percentages for Asian and Other pedestrians were slightly lower than those recorded for White pedestrians.

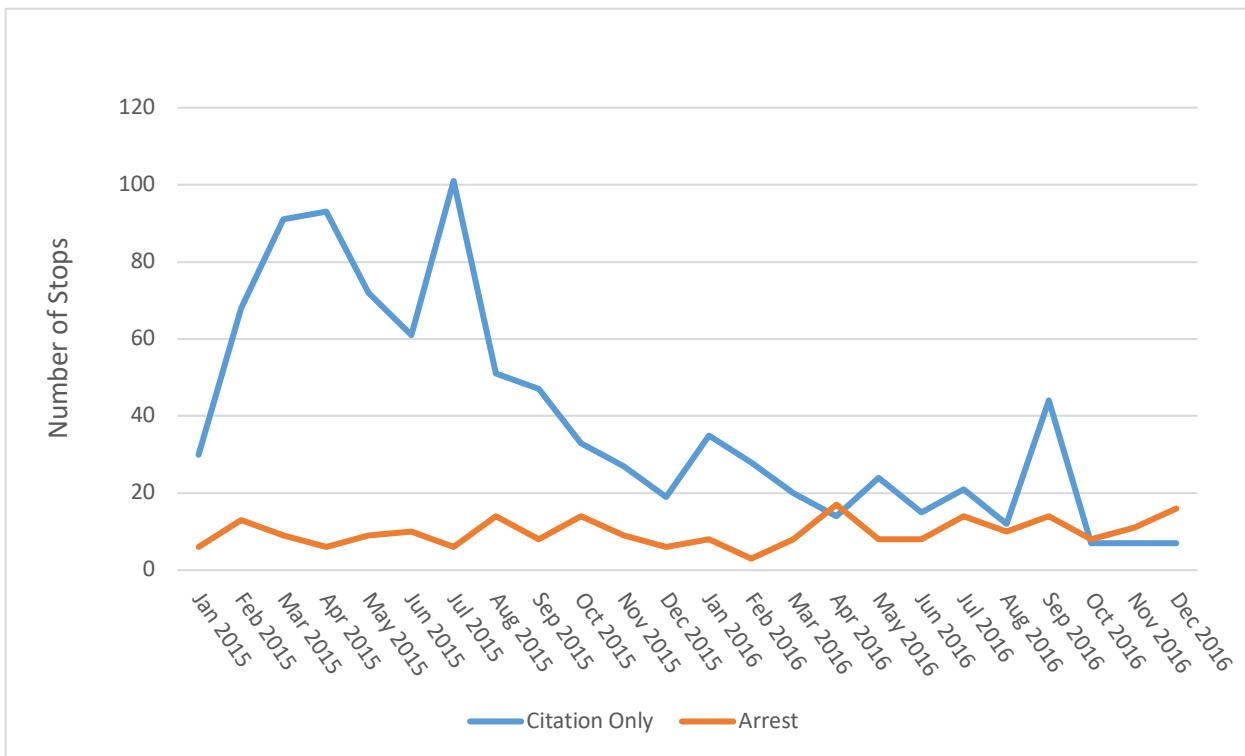
Figure 18. Pedestrian Stop Outcomes, by Month, 2015-2016

Figure 18. This graph displays the number of pedestrian stops that resulted in a citation (without arrest) or an arrest, by month. The number of arrests remained relatively constant over time, averaging 9.8 per month. The number of citations varied greatly across the observation period, ranging from peaks of 93 in April 2015 and 101 in July 2015 to fewer than 10 citations at pedestrian stops in October, November, and December 2016.

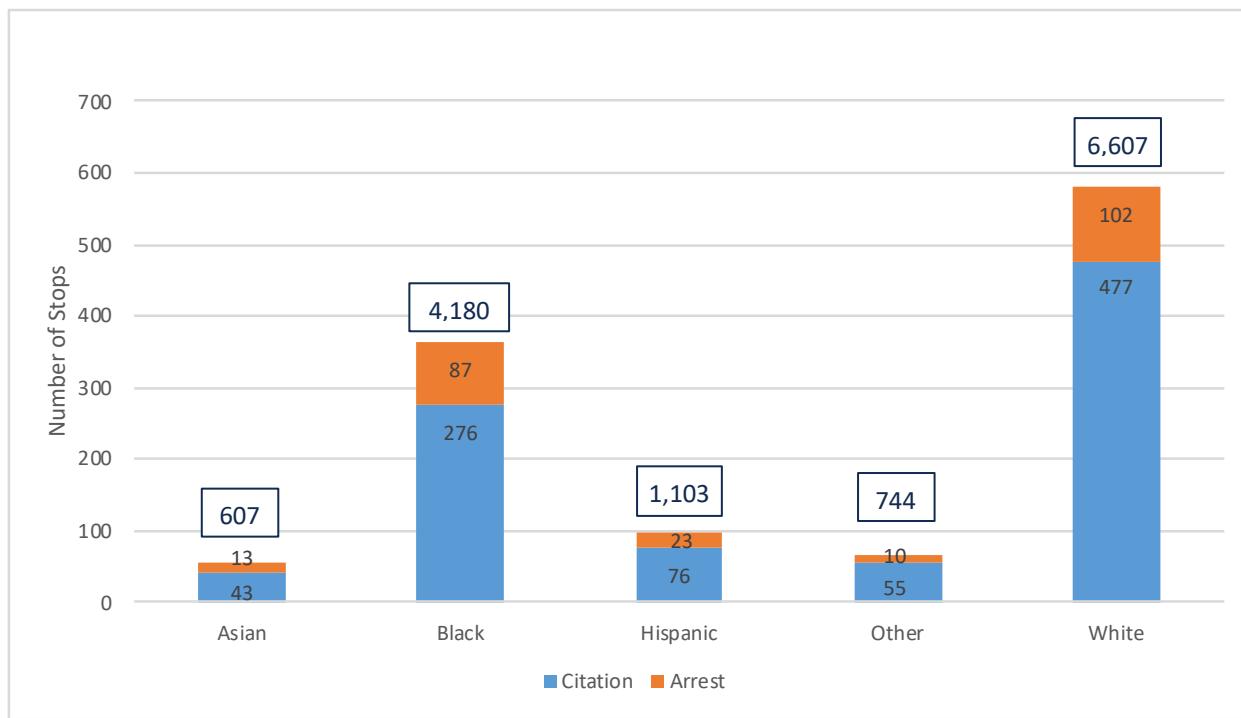
Figure 19. Pedestrian Stop Outcomes by Race, 2015-2016

Figure 19. This graph displays the number of stops that resulted in a citation only or an arrest by racial group. The number of stops that did not result in a citation or arrest is presented in the boxes above each bar. White pedestrians, who comprise 56% of the population, were cited and arrested more frequently than pedestrians of other racial groups. Rates of arrest (between 1.4% and 2%) and rates of citation only (6.1% to 6.8%) were similar across racial groups. The much higher stop rate for Black pedestrians (see **Figure 16**), though, resulted in a disproportionate number of citations and arrests of Black pedestrians relative to their share of the population.

Section 2C: Interpretation of Racial Disparities in Vehicle and Pedestrian Stops

In this section, we assess racial disparities in vehicle and pedestrian stops by comparing arrest rates across racial groups. Because CPE received no data as to whether BPD searches uncovered contraband, the arrest rate (at stops involving searches) is used as a proxy for the yield rate. Ideally, the yield rate would be measured using the percentage of stops that revealed contraband. The aim of yield rate analysis is to identify how much of the racial disparity in search rates might be attributable to differential rates of criminal behavior. Racial disparities in the yield rate that are unexplained by differential rates of lawbreaking may be (but are not necessarily) attributable to racial bias, and warrant further investigation.

Yield rate analyses posit that if members of different racial groups are subjected to equal levels of suspicion and equivalent treatment, then stops of members of each group should be equally likely to uncover illegal activity. On the other hand, if one group is more likely to be stopped at lower levels of suspiciousness, “yield rates” (or in the case of this report, arrest rates) for this group are likely to be lower. The analyses below present and discuss the yield rates of pedestrian and vehicle stops, measured by arrests. Although equivalent search and yield rates across racial groups are not sufficient to conclude that a department is free of racial bias, observed differences in search and yield rates are an indicator of disparity that indicates the likely utility of further investigation.

Yield rate analysis examines the outcomes of stops once they occur. If officers stop and search all drivers at the same level of suspicion, regardless of race, then arrest rates—the rate at which stops and searches uncover illegal activity—should be similar for each racial group. Where the arrest rate resulting from a search is lower for one racial group than it is for another, that finding suggests that the group with the lower yield rate is being stopped and searched for lesser reason (i.e., at a lower level of suspicion) than a group with a higher yield rate: that is, members of the first group are more likely to be stopped while they are engaged in no unlawful conduct. Yield rates can also be used to assess the efficiency of policing resource allocation: to the extent that searches of a particular group are frequent but yield a low yield rate, officers’ time and attention is being spent on behavior that fails to detect or deter criminal activity.

Our use of arrest as a proxy for the “yield rate” assumes that, if an officer discovers evidence of any unlawful activity, s/he will arrest the driver. A limitation of this assumption is that officers almost certainly do not exercise their discretion in this mechanical way. An officer who discovers evidence of a minor crime—say, finds a marijuana cigarette in the car—might not invariably arrest the driver. The use of arrest as a proxy for unlawful behavior will necessarily miss any racial disparities in officers’ discretionary decision-making about whether or not to make an arrest. Conversely, a driver could be arrested without the car being searched, or for reasons unrelated to the search (e.g. an outstanding warrant). To more precisely assess the productivity of BPD searches, BPD should track and share information about whether its searches uncover contraband.

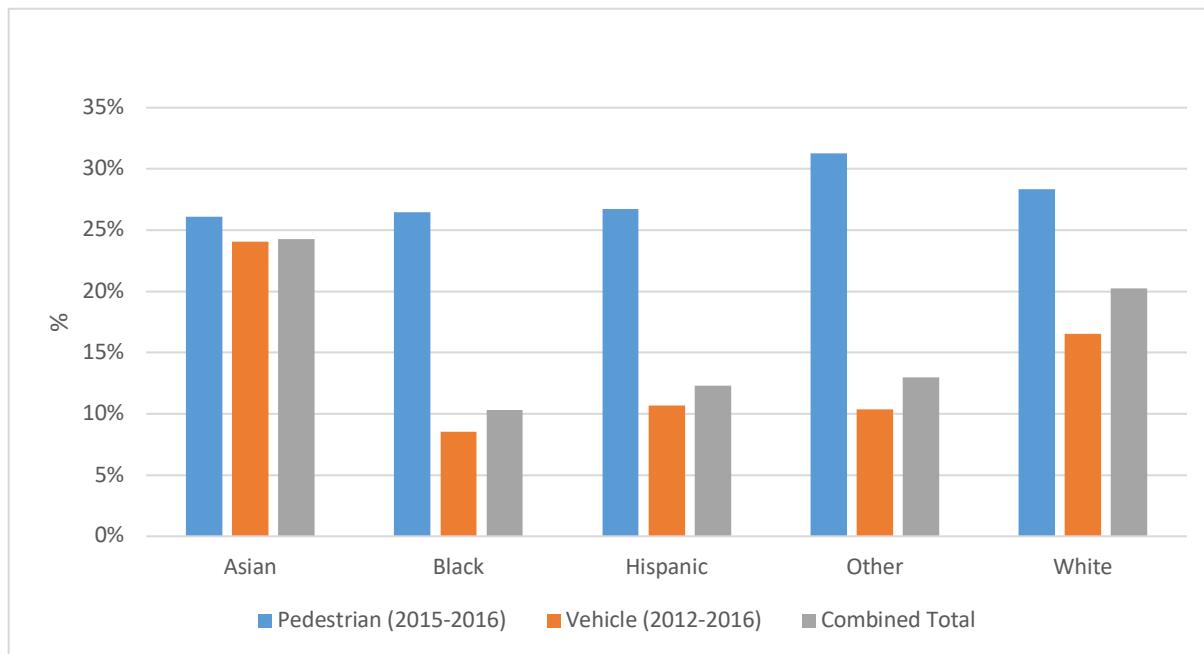
Figure 20. Percent Arrested Among Individuals Searched

Figure 20. This graph displays the percentage of persons who were arrested, among those stopped and searched by BPD. Overall, 20% of White persons who were searched by BPD were arrested. Substantial disparities in yield rates were observed with respect to Hispanic persons (12% of whom were arrested after a search) and Black persons (10% of whom were arrested after a search). That is, searches of Black and Hispanic individuals were less productive at uncovering criminal behavior. Searches of Black individuals were only half as likely as searches of Whites to yield an arrest, and searches of Hispanic individuals were 39% less likely to yield an arrest. Although Black and Hispanic drivers and pedestrians were more likely to be stopped and searched than their White counterparts were, Black and Hispanic persons were more likely to be found doing nothing wrong.

Arrest rates were much higher among Asian-Americans searched by BPD. Asian-American drivers and pedestrians were much less likely than other groups to be stopped or searched, but once searched, they were arrested at a higher than their White, Black, or Hispanic counterparts. 24% of Asian-Americans who were searched by BPD were charged with a criminal offense.

Overall, then, these data reveal considerable variation in stop, search and arrest rates among White, Black, Hispanic, and Asian-American drivers:

- once stopped by BPD, about one in 20 White drivers is searched, and about one fifth of these drivers are charged with a criminal offense.
- Hispanic drivers are about twice as likely as White drivers to be pulled over (Figure 9). Once stopped, Hispanic drivers are searched at 2.5 times the rate of Whites. But, once searched, they are charged with a criminal offense 36% less often than White drivers who are searched.

- Black drivers are about 6.5 times more likely than White drivers to be pulled over (Figure 9). Once stopped, Black drivers are searched at four times the rate of Whites. But, once searched, they are charged with a criminal offense half as often as White drivers who are searched.
- Asian-American drivers are less likely than White drivers to be pulled over. Once stopped, they are searched at the same rate as White drivers, but, once searched, they are criminally charged at a rate 55% higher than that of Whites.

These yield-rate disparities are not consistent with the application of similar, nonracial levels of suspicion to Black, Hispanic, Asian, and White drivers. The higher stop and search rates for Black and Hispanic drivers do not appear to reflect higher rates of unlawful conduct by Black and Hispanic drivers. They appear to be consistent with Black and Hispanic drivers being searched at a lower level of suspicion, so that more innocent persons in these groups experience searches by BPD.

It is unclear why higher search rates would be required to detect criminal behavior by stopped Black and Hispanic drivers as compared to stopped White or Asian drivers. It is unclear why Asian and White drivers' criminality can be more effectively detected with fewer searches of innocent persons in those groups. Put another way, these findings raise the question: if White drivers were stopped and searched at rates as high as those experienced by Black and Hispanic drivers, would their arrest rate increase? If Black and Hispanic drivers were searched at a level of suspicion as high (that is, as infrequently) as White and Asian drivers, would a higher percentage of those searches reveal criminal wrongdoing?

While BPD's Black-White and Hispanic-White disparities in stop and search rates may be partially attributable to higher rates of criminal behavior among those communities, the experience of many other US jurisdictions suggests that another explanation should also be considered: because stop, search and arrest are all discretionary decisions by the officer, it is possible that Black and Hispanic drivers might be subjected to a less forgiving exercise of discretion compared to White drivers. It is possible, for example, that Black or Hispanic drivers might be arrested for minor offenses for which a White driver might receive a citation or a warning. This would be consistent with the finding (Figure 6) that White drivers are more than twice as likely as Black drivers to receive a citation without an arrest. To confirm or rule out either the "best-case" or the "discretionary" explanation, BPD would need to share, and CPE would need to analyze, data about whether searches reveal contraband, and data about the charges that are filed against drivers who are arrested during vehicle stops.

By contrast, Asian-American individuals were less likely than White individuals to be stopped, and they were about equally likely to be searched. Nonetheless, the yield rate for Asian-Americans was 20% higher than for Whites (and double that for Hispanic individuals, and more than double the yield rate for Black individuals). The low stop rates of Asian-American drivers and the high percentage of arrests are unexplained, and warrant further investigation. Information about charges filed against drivers who are arrested at stops might help to illuminate the respective roles of community behavior and officer discretion in these results.

Part III: Racial Disparities in Use of Force

This section presents data received from BPD about reported use-of-force incidents. BPD provided a dataset of force incidents reported by BPD officers between January 1, 2012 and December 31, 2016. Section III.A presents aggregate trends in use of force incident rates over time, then presents descriptive statistics on force type, BPD beat, and race/ethnicity. Section III.B presents multivariate regression analyses designed to assess how much of the observed racial disparity in BPD use of force can be explained by neighborhood characteristics, including poverty, crime rates, and neighborhood racial demographics.

Descriptive statistics presented in this section reflect data shared by BPD with respect to use of force reports filed by its officers across the 60-month observation period. This data must be viewed in the context of BPD departmental policy, which requires the completion of a use of force report whenever an officer uses lethal force, discharges a firearm, or uses a nonlethal weapon (e.g. oleoresin capsicum spray or baton).⁶ BPD departmental policy does not explicitly require that use of physical force be reported (in a Use of Force Report or Incident Report) unless the officer uses a weapon, the individual is injured, or the individual complains. As a result, incidents of hands-on force not involving a weapon may not be comprehensively reported or tracked by BPD, and may not be fully reflected in the data presented in this section.

Where multiple types of force were reportedly used on a person during the same incident, or when multiple officers reported using the same type of force during the same incident, our analysis counts the event as a single incident, classified according to the most severe force type used. A single incident, then, could include multiple force types, multiple applications of force, or multiple officers.

Most, but not all, people who were subjected to BPD force were arrested. Of persons subject to force for whom officers recorded a racial identity (only 1.2% of force incidents were missing racial data), arrest rates were similar: 84.8% of Black persons, 81.4% of White persons, 83.3% of Hispanic persons, and 88.9% of Other persons who were subjected to force were also arrested. Among Asian persons subjected to force, only 40% were arrested. CPE researchers did not receive information about the charges filed against persons subject to force, nor did we receive information about what happened to the approximately one in six persons subjected to BPD force who were not arrested.

Most arrests, of course, do not involve any reported use of force. Among persons arrested by BPD between 2012 and 2016, the percentage subjected to force was higher among White (1.7%) and “Other” persons arrested (1.6%) than among those described as Asian, Black or Hispanic (all 1.3%). These data also show that 50.5% of persons arrested by BPD are Black, and 29.7% are White.

⁶ BPD General Order U-2, ss.23 and 24.

CPE did not receive any information about whether or how persons involved in force incidents had resisted police officers.

Summary of findings:

Compared to other departments of similar size, BPD records show relatively few use-of-force incidents (2.9 per month, on average), a finding which may be partly attributable to the use-of-force reporting policy described above. Despite the fact that BPD policy does not appear to require reporting of every incident of hands-on force, hands-on force without use of any tool or weapon was by far the most frequent force type reported by BPD officers: 76% of incidents reported by BPD officers involved only hands-on force.

Although Black people comprise 8% of the Berkeley population, they comprised nearly half (46%) of all persons subjected to force by BPD officers. Per capita, controlling for other factors, the use of force incident rate was more than 12 times higher for Black persons than for White persons in Berkeley. This disparity was not explained by differences in crime rates, poverty, or neighborhood demographics. This large unexplained racial disparity warrants further investigation.

Section 3A. Use of Force Counts and Racial Disparities

CPE received records of 173 discrete incidents of force being used upon a single individual. In 38% of cases, a single officer was involved. Most force incidents—62% of them—involved more than one BPD officer. 83% of reported incidents involved use of a single force type being used (as noted above, the most common reported force was hands-on); 17% of force reports indicated that more than one type of force was used in the incident.

Some of the data on incident locations were contradictory. For example, in 10 cases the “City” indicator located the incident in a city other than Berkeley; however, 6 of these were geo-located by address to a census tract within Berkeley. A total of 10 incidents could not be geo-located to a census tract, and 2 incidents occurred outside of Berkeley (one occurred in Hercules, in Contra Costa County, and one occurred in Dublin, in Alameda County).

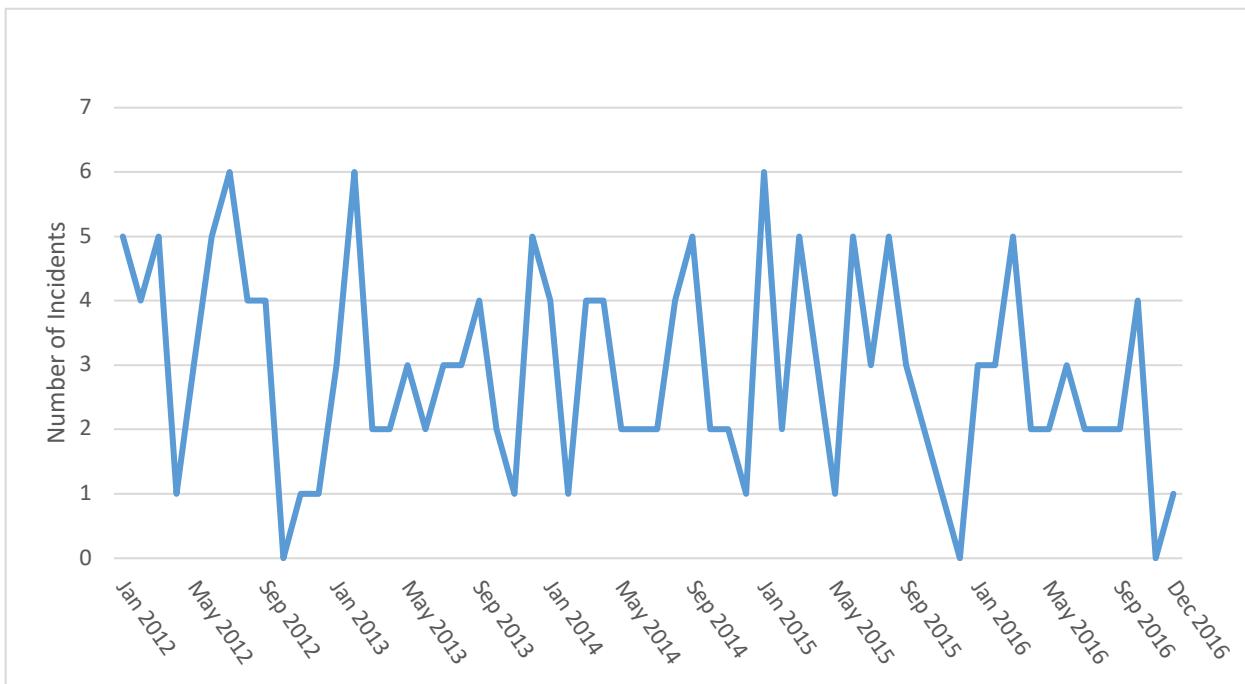
Figure 21. Use of Force Incidents by Month, 2012-2016

Figure 21. This graph displays the number of force incidents reported by BPD per month. The number of incidents reported monthly was low and variable, ranging from one to six incidents per month across the five-year study period, and averaging three incidents per month and holding fairly steady across the observation period. BPD also shared one report of discharge of a firearm, but it is not presented here because no demographic or location data was provided for it.

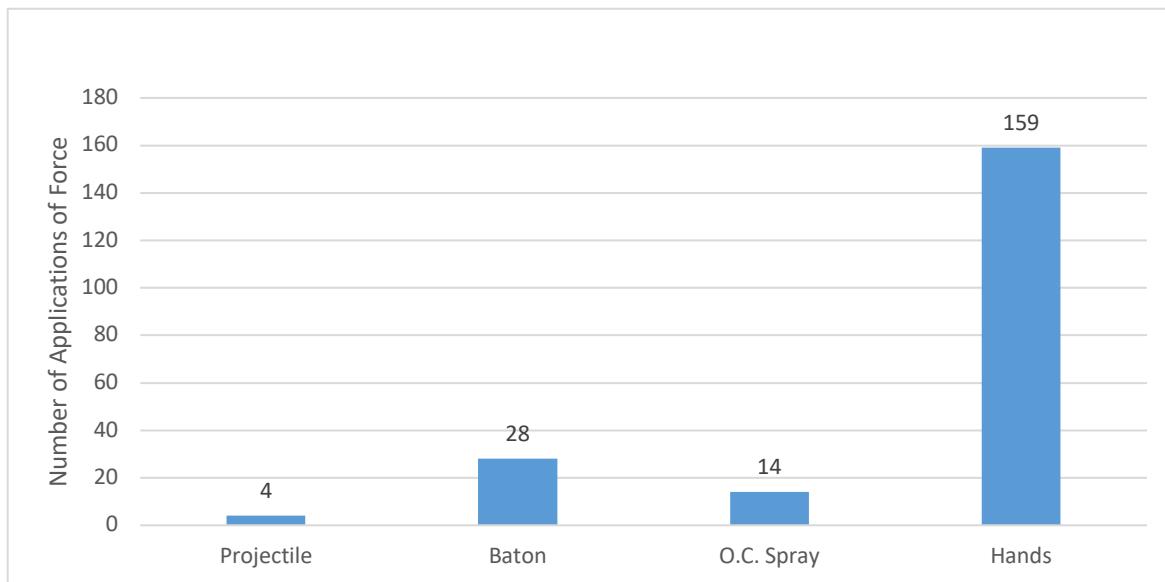
Figure 22. Number of Force Types Reported, 2012-2016

Figure 22. This graph displays the number of force types reported in force incidents reported by BPD officers. As noted above, a single incident may be counted multiple times in this graph if multiple force types were used. As can be seen, even though BPD policy does not require comprehensive reporting of hands-on weaponless force (see footnote 6, on p. 42), and accompanying text), hands-on force was by far the most frequent force type reported by BPD officers during the observation period. Most force incidents that reported use of a weapon (67%) also reported use of hands-on force.

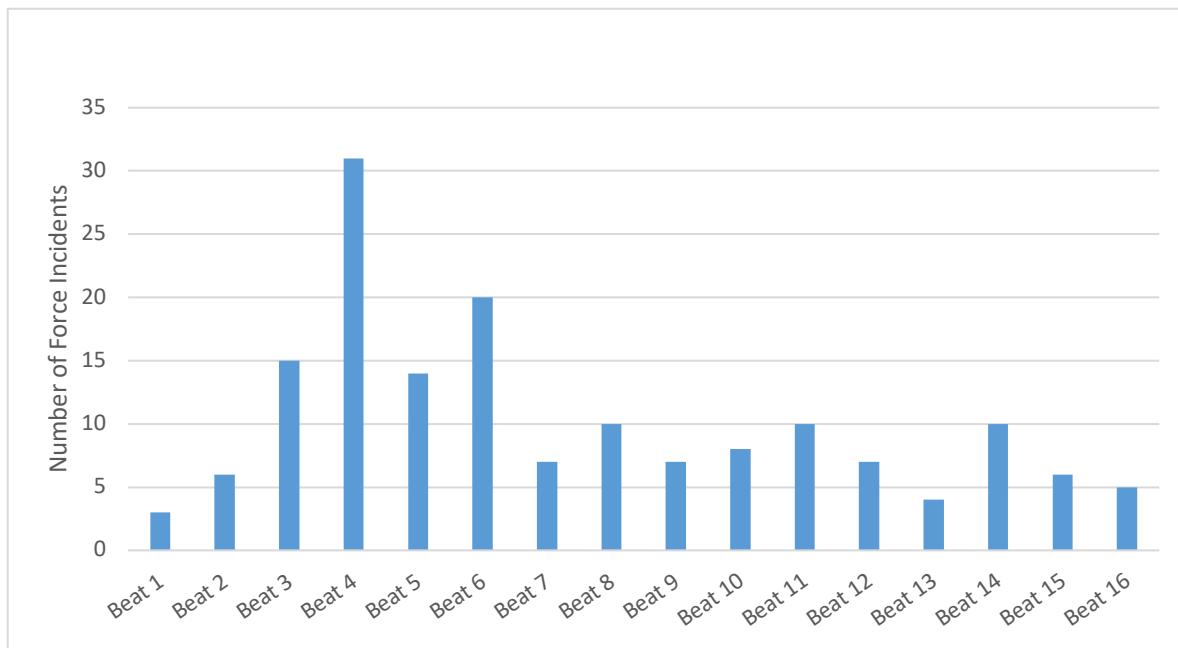
Figure 23. Number of Force Incidents by Beat, 2012-2016

Figure 23. This graph displays the number of force incidents reported by each BPD beat. As can be seen, Beat 4 reported the most incidents (31), followed by Beat 6 (20) and Beat 3 (15). Beats 1 and 13 each reported fewer than five force incidents during the five-year study period.

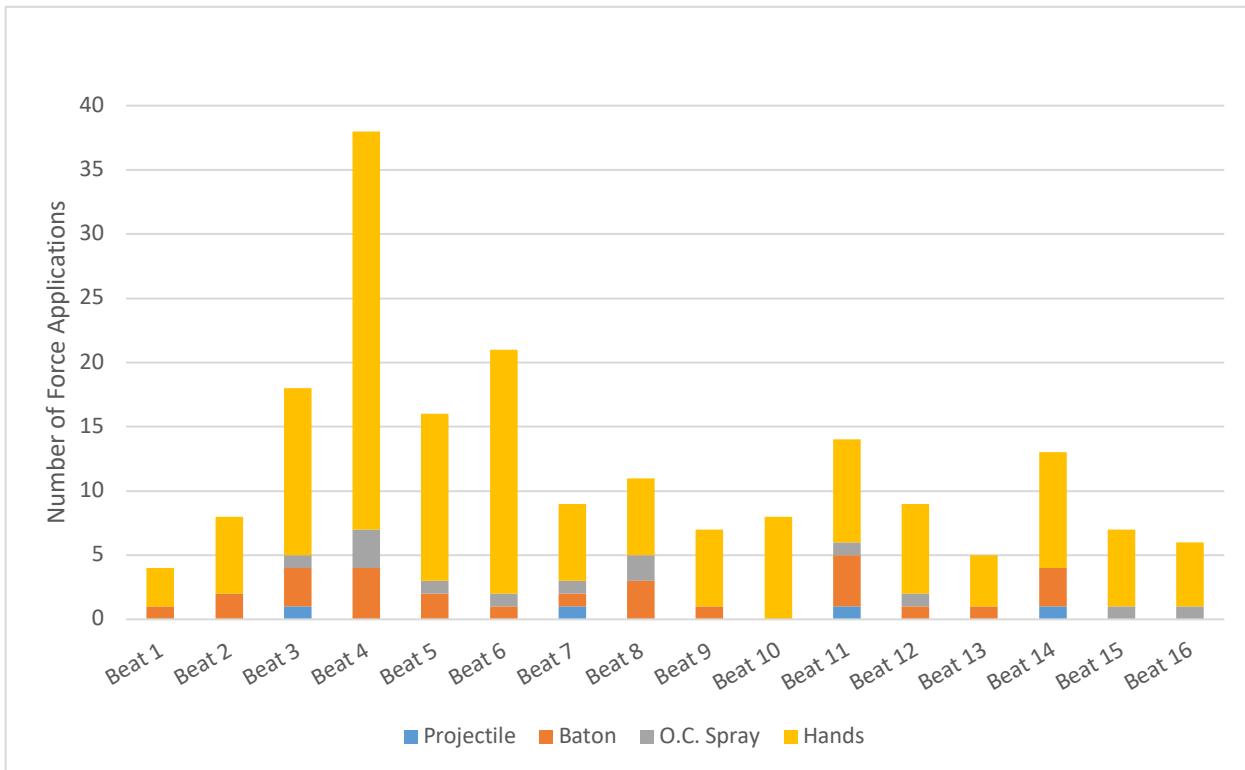
Figure 24. Frequency of Force Types Reported, by Beat, 2012-2016

Figure 24. This graph displays the number of force types reported in incidents reported by officers from each BPD beat. As noted above, a single incident may be counted multiple times in this graph if multiple force types were used. As can be seen, hands-on force accounts for most incidents, but most beats also reported incidents of baton use, and each of Beats 4 and 8 reported more than one O.C. spray incident.

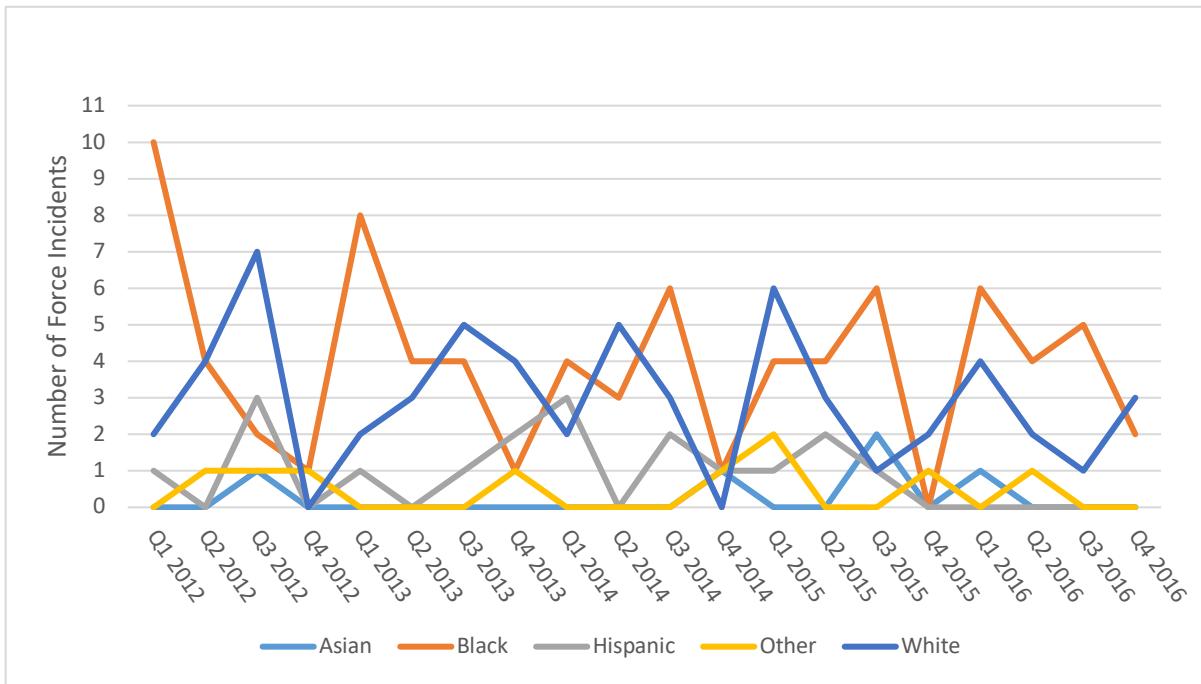
Figure 25. Number of Force Incidents by Race 2012-2016

Figure 25. This graph displays the number of force incidents per quarter by race. As can be seen, in nearly every quarter, force incidents involving Black and White individuals were more frequent than force incidents involving Hispanic, Asian, or Other individuals. Although the White population of Berkeley is seven times larger than its Black population, BPD officers reported more incidents of use of force on Black individuals than on White individuals.

Black persons, who comprise 8% of the Berkeley population, were the subjects of 46% of reported force incidents. White persons, who comprise 56% of the Berkeley population, accounted for 35% of reported force incidents. 11% of reported force incidents involved Hispanic individuals, 5% involved Other individuals, and 3% involved Asian individuals.

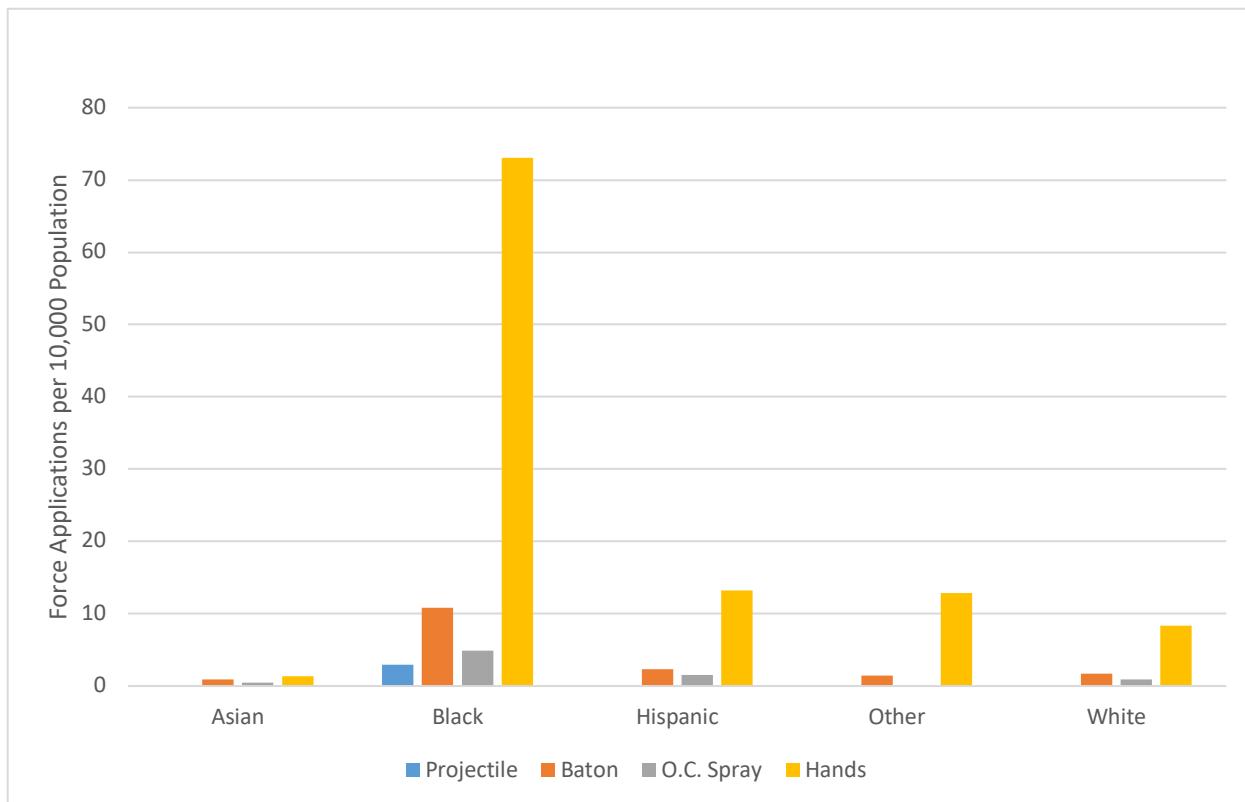
Figure 26. Force Types Used, per 10,000 Population, by Race 2012-2016

Figure 26. This graph displays the number of force incidents reported by BPD officers, benchmarked against the resident population by race. The rate of hands-on force used against Black persons, per capita, was much greater than that for White persons. For every 10,000 White residents of Berkeley, BPD reported 8 uses of hands-on force on a White person. For every 10,000 Black residents of Berkeley, BPD reported 73 uses of hands-on force on a Black person—a rate 9.1 times higher than for White individuals.

Rates of baton use (6.4 times greater) and O.C. spray (5.3 times greater) were also much higher for Black persons than for White persons. Disparities were also visible with respect to Hispanic persons, who were moderately more likely than White persons to be subjected to use of hands-on force, baton, and O.C. spray.

Section 3B. Interpreting Disparities in Use of Force

As the data in the graphs and tables above show, Black individuals in Berkeley are much more likely to be subjected to police use of force than White individuals are. As is mentioned above, not all observed disparities result from biased or unjust decision-making by police officers or executives. As is mentioned in the Introduction, above, our analysis seeks to distinguish, as much as possible, three possible explanations for disparate policing outcomes: (1) disparities that arise from community characteristics (such as poverty, high crime rates, and calls for service); (2) disparities that arise from police behavior (such as policing practices or individual officer biases); and (3) disparities that arise from the (trusting or wary) relationship between communities and police.

These factors cannot be precisely disaggregated using the limited dataset available to researchers for this report. To begin to quantify the effects of race on policing outcomes, we use statistical analysis techniques called “regression analysis.” Regression analyses allow for estimates of how much of the observed racial disparity is accounted for by racial or nonracial community-level factors that can influence law enforcement patterns, and how much of the racial disparity is unexplained (and possibly attributable to policing policy and practice).

In the data we have received from BPD, one major question to be investigated was the effect of race on the likelihood that a person would be subjected to police use of force in Berkeley. The BPD datasets provided information about use of force incidents. The BPD use of force report form contains a field for the location at which the force incident occurred. For the 161 reported incidents that contained geographic information and occurred within the Berkeley city limits, geocodes were developed using the longitude and latitude or street intersection information in the records. Using these geocodes, researchers were able to ascertain the Berkeley census tract in which each stop or incident took place. (Incidents for which geolocation data was unavailable, or which occurred outside Berkeley, were not included in this analysis.)

Using data from the decennial census and the American Community Survey (ACS), researchers were able to ascertain demographic information about the census tract in which each stop or incident took place. BPD shared data on all arrests made, including geographic location, which enabled us to match the number of Part 1 crimes reported in each census tract for the same time period. For each census tract, researchers were able to assess how much of the racial disparity in use of force was attributable to neighborhood factors such as poverty, racial demographics, or the Part I crime rate.⁷ The existing research literature has found relationships between all of these factors and policing outcomes.

⁷ “Part I crime” refers to the categorization scheme used by the U.S. Federal Bureau of Investigation Uniform Crime Reporting Statistics. The FBI’s “Part I” category consists of the following eight types of crime: criminal homicide, forcible rape/sexual assault, robbery, aggravated assault, burglary, larceny-theft (except motor vehicle theft), motor vehicle theft, and arson.

Table 1. Descriptive Statistics on Use of Force by Individual Race

| Hands-On | 2012 | 2013 | 2014 | 2015 | 2016 | Total |
|-----------------|-------------|-------------|-------------|-------------|-------------|--------------|
| Asian | 0 | 0 | 1 | 1 | 1 | 3 |
| Black | 15 | 17 | 13 | 14 | 15 | 74 |
| Hispanic | 4 | 4 | 5 | 4 | 0 | 17 |
| Other | 3 | 1 | 1 | 3 | 1 | 9 |
| White | 13 | 13 | 9 | 10 | 9 | 54 |
| Total | 35 | 35 | 29 | 32 | 26 | 157 |

| Baton | 2012 | 2013 | 2014 | 2015 | 2016 | Total |
|-----------------|-------------|-------------|-------------|-------------|-------------|--------------|
| Asian | 1 | 0 | 0 | 1 | 0 | 2 |
| Black | 2 | 2 | 2 | 2 | 3 | 11 |
| Hispanic | 1 | 1 | 1 | 0 | 0 | 3 |
| Other | 0 | 1 | 0 | 0 | 0 | 1 |
| White | 3 | 0 | 2 | 4 | 2 | 11 |
| Total | 7 | 4 | 5 | 7 | 5 | 28 |

| O.C. Spray | 2012 | 2013 | 2014 | 2015 | 2016 | Total |
|-------------------|-------------|-------------|-------------|-------------|-------------|--------------|
| Asian | 0 | 0 | 0 | 1 | 0 | 1 |
| Black | 3 | 0 | 0 | 1 | 1 | 5 |
| Hispanic | 1 | 0 | 1 | 0 | 0 | 2 |
| Other | 0 | 0 | 0 | 0 | 0 | 0 |
| White | 3 | 0 | 0 | 2 | 1 | 6 |
| Total | 7 | 0 | 1 | 4 | 2 | 14 |

| Projectile | 2012 | 2013 | 2014 | 2015 | 2016 | Total |
|-------------------|-------------|-------------|-------------|-------------|-------------|--------------|
| Asian | 0 | 0 | 0 | 0 | 0 | 0 |
| Black | 0 | 0 | 0 | 1 | 2 | 3 |
| Hispanic | 0 | 0 | 0 | 0 | 0 | 0 |
| Other | 0 | 0 | 0 | 0 | 0 | 0 |
| White | 0 | 1 | 0 | 0 | 0 | 1 |
| Total | 0 | 1 | 0 | 1 | 2 | 4 |

NOTE: There was one firearm discharge reported in 2012, but race data was missing, so it is not shown in this table.

Table 1. This table displays the number of reported uses of each force type, by race of the person subjected to force. In this table, a single force incident may be counted more than once, if multiple force types were used. As can be seen, the most common force type reported by BPD officers was hands-on. The next most frequent type of force reported by BPD officers was the baton, followed by OC spray.

As noted above (Figure 25), the White population of Berkeley is seven times larger than its Black population, but BPD officers reported more force incidents involving Black individuals than White ones. This pattern held true for the most common force type reported (hands on) and for projectile use: each of these force types were reportedly used more frequently on Black than White individuals. The numbers of reported use of batons (11 each) and OC spray (6 White, 5 Black) were roughly equal for Black and White persons.

For the purpose of our regression analysis, we combined incidents for subjects in Asian, Hispanic and Other racial categories into a larger Other category in order to form a group of comparable size to those of White and Black racial categories.

In order to assess the probability that people of different racial groups in Berkeley were subjected to force at equal rates, we geocoded use of force incidents and other data at the census-tract-level. We use census tracts as a rough approximation of neighborhoods, and consider whether neighborhood-level effects may account for any apparent racial differences in the per-capita rate of use of force incidents. We use a type of regression analysis—multi-level negative binomial regression modelling—to compare racial groups with and without controlling for tract-level factors. Use of force data were aggregated at the incident level (sometimes multiple types of force were recorded for the same incident). Of the 173 use of force incidents recorded within the City of Berkeley from 2012-2016, 161 contained race data as well as geolocation data that allowed for the incident to be located within one of the 54 census tracts within the City of Berkeley.

Typically, statistical significance tests and confidence interval calculations incorporate the likelihood that differences found in the observed data could be due to chance, based on an assumption that the data are randomly selected from a larger population. However, since the data in these analyses arise from police administrative records, they violate that assumption, and thus sample-based significance tests and confidence intervals have an imprecise meaning. Nevertheless, we use these calculations heuristically as a way to guard against accepting all associations as meaningful.

The overall aim of the regression analyses was to identify the degree to which the Black-White disparity in BPD use of force might be attributable to chance, or to characteristics of a neighborhood such as its poverty rate, its racial demographics, or its Part I crimes.⁸ The following table summarizes the census tract data that was used in the regression models:

Table 2. Census-Tract-Level Summary Information

| <u>Variable</u> | <u>Minimum</u> | <u>Maximum</u> | <u>Average</u> | <u>Std Deviation</u> | <u>Variance</u> |
|----------------------------------|----------------|----------------|----------------|----------------------|-----------------|
| Number of use of force incidents | 0 | 26 | 3 | 5 | 20 |
| Total population | 1,414 | 8,448 | 3,473 | 1,314 | 178,181 |
| Non-Hispanic Black population | 0 | 2,305 | 377 | 480 | 230,441 |
| Percent non-Hispanic Black | 0 | 40 | 11 | 12 | 151 |

⁸ For these regression analyses, the measure of Part I crimes was the number of Part I crimes recorded by BPD as having occurred in each census tract.

| | | | | | |
|--|-----|-------|-------|-----|---------|
| Non-Hispanic White population | 567 | 3,484 | 1,840 | 703 | 493,891 |
| "Other" racial category population | 316 | 5,373 | 1,255 | 834 | 695,127 |
| Number of Part 1 crimes (2012-2016) | 0 | 4,335 | 544 | 770 | 593,061 |
| Percent living below federal poverty level | 0 | 57 | 16 | 13 | 166 |

Table 2. Typically, statistical significance tests and confidence interval calculations incorporate the likelihood that differences found in the observed data could be due to chance, based on an assumption that the data are randomly selected from a larger population. However, since the data in these analyses arise from police administrative records, they violate that assumption, and thus sample-based significance tests and confidence intervals have an imprecise meaning. Nevertheless, we use these calculations heuristically as a way to safeguard against accepting all associations as meaningful.

The five regression analyses that we conducted assessed the relationship between the Black-White disparity in use of force and the census tract characteristics described above. We conducted five statistical calculations, or “models,” to assess whether and how much certain variables affected the Black-White racial disparity. For each of the models presented, use of force incident rates for those in the Other racial category were not meaningfully different from those in the White category. The discussion of these analyses will therefore address the Black-White disparity only.

In sum, after controlling for local levels of crime, poverty, and neighborhood demographics, Black persons in Berkeley experienced BPD use of force at a rate about 12 times greater than for their White counterparts. This difference is not attributable to random chance, and is not explained by local levels of crime, poverty or resident racial composition.

The table below presents the results of five regression models. Model 1 uses only individual race as a predictor. Model 2 controls for the number of Part 1 crimes reported (2012-2016). Model 3 controls for the percentage of the tract living below the federal poverty level. Model 4 controls for the percentage of the tract population that is non-Hispanic Black. Model 5 includes all these controls.

Table 3. Regression Model Results

| | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 |
|---|---|---|---|---|---|
| Parameter | Use of Force Incident Ratio (95% CI) |
| Racial Category | | | | | |
| Black | 10.8** (6.4, 18.2) | 10.5** (6.3, 17.4) | 10.5** (6.2, 17.7) | 12.3** (7.3, 20.8) | 12.6** (7.6, 21.0) |
| Other | 0.7 (0.4, 1.4) | 0.7 (0.4, 1.2) | 0.7 (0.4, 1.3) | 0.8 (0.4, 1.4) | 0.7 (0.4, 1.3) |
| White | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Number of Part 1 Crimes, +1 SD | | 2.4** (1.8, 3.2) | | | 2.2** (1.7, 3.0) |
| Percent living below federal poverty level, +1 SD | | | 1.7** (1.2, 2.6) | | 1.0 (0.7, 1.4) |
| Percent of population that is Black, +1 SD | | | | 0.5** (0.3, 0.8) | 0.6** (0.4, 0.8) |

**p <0.01

CI = confidence interval; SD = standard deviation

Model 1 finds that, controlling for the variation in use of force incident rates that is accounted for by members of different racial groups residing in the same census tracts, the Black resident population experienced 10.8 times the use of force incident rate as that of the White resident population. The greater rate of use of force incidents for Blacks is not likely to be due to chance.

Model 2 controls for reports of Part 1 crime. This analysis only slightly attenuates the use of force incident rate ratios: after controlling for the rate of [arrests for/reports of] Part I crime in each neighborhood—that is, taking into account that Black people are disproportionately represented among persons arrested for Part I crimes—Black people remain 10.5 times more likely to be subjected to force than their White counterparts. While high-crime neighborhoods (tracts with Part I crime counts one standard deviation higher than average (representing 770 additional crimes) experienced larger numbers of force incidents, local crime rates explain very little of the Black-White racial disparity in BPD use of force. This finding is not likely to be due to chance.

Model 3 controls for the percentage of the tract population living under the federal poverty level. Controlling for the neighborhood poverty rate only slightly attenuates the racial disparity observed at Model 1. High-poverty neighborhoods (population living under federal poverty level one standard deviation higher, or 13 percentage points greater) experienced more use of force incidents, but the poverty rate explains very little of the Black-White racial disparity in BPD use of force. This finding is not likely to be due to chance.

Model 4 controls for the percentage of the tract population that was non-Hispanic Black. Controlling for the percentage of Black residents in a neighborhood *increased* the disparity

predicted by this model. Census tracts with a Black population percentage one standard deviation higher (12 percentage points) experienced, on average, half as many force incidents per person. Black neighborhoods had fewer use of force incidents per person, but the Black-White racial disparity in use of force incident rates is greater when the racial composition of neighborhoods is factored into the analysis. Controlling for neighborhood percentage Black resulted in a rate ratio for Blacks that is 12.3 times greater than that for Whites. This finding is not likely to be due to chance.

Model 5 includes all of the statistical controls from Models 1-4 in the same model simultaneously. In this combined model, crime and the population percentage Black remain important predictors of use of force incident rates, but the percentage living in poverty was no longer significant. (Other analyses (available from authors) showed that the poverty effect seen in Model 3 was explained by the number of Part 1 crimes. In other words, neighborhoods with higher poverty levels had more frequent use of force incidents, but only because they had more Part 1 crimes.) Controlling for all three factors, Black persons were 12.6 times more likely than Whites to be subjected to BPD use of force.

Appendix A.

Table 4. Vehicle Stops Outside Berkeley, 2012-2016

| City | Asian | Black | Hispanic | Other | White | Total |
|---------------------------|-------|-------|----------|-------|-------|-------|
| Albany | 7 | 32 | 18 | 17 | 62 | 136 |
| Emeryville | 25 | 322 | 65 | 36 | 120 | 568 |
| Kensington (Contra Costa) | 4 | 5 | 2 | 2 | 17 | 30 |
| Oakland | 72 | 1220 | 192 | 138 | 372 | 1994 |
| Total | 108 | 1579 | 277 | 193 | 571 | 2728 |

Table 5. Pedestrian Stops Outside Berkeley, 2015-2016

| City | Asian | Black | Hispanic | Other | White | Missing | Total |
|---------------------------|-------|-------|----------|-------|-------|---------|-------|
| Albany | 0 | 1 | 0 | 0 | 4 | 0 | 5 |
| Emeryville | 0 | 3 | 0 | 0 | 1 | 1 | 5 |
| Oakland | 1 | 19 | 0 | 0 | 5 | 0 | 25 |
| Kensington (Contra Costa) | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| Total | 1 | 23 | 0 | 1 | 10 | 1 | 36 |