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TECHNICAL REPORT

Police-Community Relations in Cincinnati

Year Three Evaluation Report

Terry Schell, Greg Ridgeway, Travis L. Dixon, Susan Turner, K. Jack Riley

Sponsored by the City of Cincinnati

Safety and Justice

A RAND INFRASTRUCTURE, SAFETY, AND ENVIRONMENT PROGRAM

The research described in this report was sponsored by the City of Cincinnati and was conducted under the auspices of the Safety and Justice Program within RAND Infrastructure, Safety, and Environment (ISE).

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Preface

This is the third annual report that the RAND Corporation has produced on police-community relations in Cincinnati. The reports are required under RAND's contract to evaluate whether an agreement on police-community relations in Cincinnati is achieving its goals. The collaborative agreement was reached in 2002 and extended in 2007, when the Cincinnati Police Department joined with other agencies and organizations (collectively referred to here as *the parties*) to enact a series of reforms and initiatives intended to improve police-community relations in the city.

This report should be of interest to policymakers and community members in Cincinnati and elsewhere in Ohio. This report may also prove useful to residents and officials in other jurisdictions in which similar issues are being confronted. The City of Cincinnati funded this project on behalf of the parties to the collaborative agreement. The first and second years' reports can be found in Riley et al. (2005) and Ridgeway et al. (2006), respectively. Other, recent and related RAND works that may be of interest to readers of this report include the following:

- *Analysis of Racial Disparities in the New York City Police Department's Stop, Question, and Frisk Practices* (Ridgeway, 2007)
- "Assessing the Effect of Race Bias in Post-Traffic Stop Outcomes Using Propensity Scores" (Ridgeway, 2006)
- "Testing for Racial Profiling in Traffic Stops from Behind a Veil of Darkness" (Grogger and Ridgeway, 2006)
- *Race and the Decision to Seek the Death Penalty in Federal Cases* (Klein, Berk, and Hickman, 2006).

The RAND Safety and Justice Program

This research was conducted under the auspices of the Safety and Justice Program within RAND Infrastructure, Safety, and Environment (ISE). The mission of ISE is to improve the development, operation, use, and protection of society's essential physical assets and natural resources and to enhance the related social assets of safety and security of individuals in transit and in their workplaces and communities. Safety and Justice Program research addresses occupational safety, transportation safety, food safety, and public safety—including violence, policing, corrections, substance abuse, and public integrity.

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Introduction

In 2002, the Cincinnati Police Department (CPD), the Fraternal Order of Police, and the American Civil Liberties Union (ACLU) joined together in a collaborative agreement to resolve social conflict, improve community relations, and avoid litigation in Cincinnati. The collaborative agreement requires the parties (that is, the participants in the agreement) to undertake collective efforts to achieve these goals. Specifically, the agreement requires CPD to implement a variety of changes in pursuit of five primary goals:

- Ensure that police officers and community members become proactive partners in community problem solving.
- Build relationships of respect, cooperation, and trust within and between police and communities.
- Improve education, oversight, monitoring, hiring practices, and accountability of CPD.
- Ensure fair, equitable, and courteous treatment for all.
- Create methods to establish the public's understanding of police policies and procedures and recognition of exceptional service in an effort to foster support for the police (*In re Cincinnati Policing*, S.D. Ohio, 2003, pp. 3–4).

Evaluation is a stipulated component of the agreement. RAND was chosen as the evaluator in 2004 to aid the parties in understanding progress toward the agreement's goals. RAND will conduct the evaluation for five years, with the results published annually in a report available to the public. The evaluation has used a variety of methods, including the following:

- a survey of citizen satisfaction with CPD
- a survey of citizens who have interacted with the police through arrest, reporting a crime or victimization, or being stopped for a traffic violation
- a survey of CPD officers about their perceptions of support from the community, working conditions, and other factors related to job satisfaction and performance
- a survey of officers and citizens involved in a sample of citizen complaints against the officers and the department
- an analysis of motor-vehicle stops for patterns of racial disparity in various aspects of the stop
- periodic observations of structured meetings between citizens and representatives of CPD
- a review of CPD statistical compilations

- analysis of a sample of videotaped interactions between citizens and officers during motor-vehicle stops
- analysis of CPD staffing, recruitment, retention, and promotion patterns.

Under the terms of the evaluation protocol, this year-three report addresses only the statistical compilations, motor-vehicle stops, and videotaped citizen-police interactions during vehicle stops. Many of these tasks will reoccur in subsequent years, including all of the tasks included in this year's report. As such, this is necessarily an interim report and will not provide a final or comprehensive evaluation of progress toward the goals of the collaborative agreement.

The Context of Policing in Cincinnati

A critical component of the evaluation is to understand the context of policing in Cincinnati. To that end, CPD provides RAND with statistical compilations that detail arrest and citation activity, calls for service, and crime patterns. These compilations provide insight into how crime, and thus the allocation of law-enforcement resources, varies across neighborhoods. The compilations also feed in to other analyses conducted as part of the evaluation.

Crime and Calls for Service

Overall, crime, the associated enforcement activities, and calls for service remained highly clustered in specific portions of the city. Overall crime rates were nearly unchanged between 2005 and 2006. There were changes within neighborhoods. Downtown and Over-the-Rhine had large reductions in crime, but increased crime in other neighborhoods, such as East Price Hill and Walnut Hills, offset these gains.

Crime rates in Over-the-Rhine dropped after April 2006 by 13 percent more than would be expected, given the trends elsewhere in the city and the trend in Over-the-Rhine prior to April 2006.

Arrests and Citations

The number of arrests in the Over-the-Rhine neighborhood increased by 9 percent between 2005 and 2006, on top of a 25 percent jump between 2004 and 2005. The increase in arrests coincides with the implementation of the Over-the-Rhine task force in April 2006.

Use of Force

The rate of use-of-force incidents per arrest remained the same as in 2005, approximately 14 uses of force per 1,000 arrests. As in previous years, there was no relationship between the type of force used and the subject's race. Black residents were the subjects of use of force in 75 percent of the incidents, approximately the same percentage as their percentage of persons arrested in Cincinnati. These rates are similar to the rates of arrest and use of force from 2004 and 2005.

Analysis of Vehicle Stops

RAND's analysis of vehicle stops assessed whether there is a departmentwide pattern of bias against black drivers in the decision to stop a vehicle; determined the fraction of CPD officers who disproportionately stop black drivers compared to other officers patrolling the same neighborhoods at the same time; and investigated whether there are racial biases in post-stop outcomes, including citation rates, stop duration, and search rates.

Department-Level Stop Patterns

We did not find evidence of departmentwide racial bias in the decision to stop certain vehicles in 2006. Similarly, when we examined data from the entire evaluation period (the first-year report included data from 2003), we did not find evidence of departmentwide bias in the decision to stop.

Individual-Level Stop Patterns

At the individual officer level, a total of five officers (out of 294 in frequent contact with the public through vehicle stops) have stop activity patterns that may be consistent with racially biased policing.[1] At a minimum, these officers' patterns should be investigated more carefully. Three officers out of 294 officers stopped black drivers at substantially higher rates when compared with other officers' stops of similarly situated individuals. Two officers appeared to be stopping more nonblack drivers than did similar officers.

Post-Stop Patterns

When comparing all stops of black and nonblack drivers, the stops of black drivers take longer on average and black drivers are subject to searches at a higher rate. However, much of these differences appear to be driven by the location and time of the stop, the type of stop, whether the driver was a Cincinnati resident, and whether the driver had a valid driver's license. To assess whether race may play a role in officers' post-stop actions, we compared the stops of black drivers with the stops of similarly situated nonblack drivers—that is, white, Hispanic, or other nonblack drivers who were stopped in similar locations, at similar times, and for similar reasons as black drivers.

Black drivers and similarly situated nonblack drivers both had a 47 percent chance of having a stop lasting less than 10 minutes, and black drivers were significantly less likely than matched nonblack drivers to have a stop exceeding 30 minutes. In addition, black drivers received citations less frequently than did similarly situated nonblack drivers (63 percent compared with 67 percent). This difference may be due to officers' reluctance to cite black drivers, or it may be an indicator that officers are stopping black drivers for discretionary offenses for which citations are rarely given.

With respect to searches, officers searched black drivers less frequently than they searched similarly situated nonblack drivers when the officers had discretion (6.1 percent versus 6.7 percent). When officers searched a driver, they were equally likely to recover contraband from black and nonblack drivers.

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[1] Federal regulations regarding the protection of human subjects prevent RAND from conducting research in a way that causes adverse effects to the subjects of, or participants in, the research. Thus, we cannot identify the specific officers. We have, however, provided CPD with the tools and methods to analyze the data and identify specific officers.

Operation Vortex

Operation Vortex is a "highly visible proactive unit that has a zero tolerance approach to street crimes, drug trafficking, and quality of life issues" (Green and Jerome, 2007). The crime-reduction strategy provides saturation patrols to areas with the greatest problems with crime.

A separate analysis of the Over-the-Rhine task force and Operation Vortex indicates that stops made by Vortex officers are more likely to involve black drivers than are stops made by other officers in the same place and at the same time (71 percent versus 65 percent). This racial disparity could not be explained by differences in the types of stops that Vortex officers make. Vortex officers made 33 percent of all vehicle stops at these times and places. Vortex officers were equally likely to issue citations to black drivers and white drivers. They were also equally likely to search black drivers and white drivers, though the rate of searches was twice that of similarly situated non-Vortex officers. Unlike non-Vortex officers, when conducting searches, Vortex officers were significantly more likely to recover contraband from white drivers than from black drivers.

Analysis of Videotaped Police-Motorist Interactions

We analyzed 318 randomly sampled video records of traffic stops from 2006 to analyze the objective characteristics of the stop (e.g., duration, infraction type, time of day) as well as measures of the communication between the driver and the police officer. The video analysis is not designed to determine whether racial inequalities are uniquely attributable to racial profiling. Instead, the analysis is designed to look for differences that community members are likely to perceive as evidence of racially biased policing, regardless of their cause. This approach highlights the factors that are barriers to improved police-community relations, but it cannot determine whether any differences occur because of race.

This analysis revealed three key differences associated with the officers' and drivers' races: (a) black drivers were more likely to experience proactive policing during the stop, resulting in longer stops that were significantly more likely to involve searches and inquiries, (b) white officers were more likely than black officers to use proactive police tactics, (c) the communication quality of white drivers was more positive than of the black drivers—specifically, it was more apologetic and less argumentative.

These results are largely consistent with the findings in the year-one and year-two reports. One difference from last year's report is the significant evidence of greater proactive policing by white officers than by black officers. This could lead some black drivers to believe that they are treated with greater suspicion. However, the actual pattern of data is quite similar to last year, with the black driver–white officer combination having the highest rates of proactive policing behaviors, epitomized by such actions as requiring identification for passengers. As noted in earlier reports, these findings cannot answer whether racial bias does or does not exist, but they do help explain why black Cincinnati residents perceive that it does, which may lead to a more negative attitude in future interactions with the police. It is therefore critical to take efforts to ensure that white and black officers act similarly when stopping motorists, so that improvements in relations between CPD and the black community are possible.

Summary and Conclusions

Data Issues

Both data availability and quality have improved over the three years of the evaluation. Generally, remaining data issues, such as the quality of video and audio tapes, are largely a function of equipment limits or relatively infrequent human errors.

Progress Toward the Goals of the Collaborative Agreement

Blacks continue to bear a disproportionate share of the impact of policing services by virtue of the clustering of crime, calls for service, and policing in predominantly black neighborhoods. While there is no evidence that the police systematically or deliberately treat blacks differently, blacks nevertheless experience a different kind of policing from that experienced by whites. In particular, blacks experience more policing and particularly more of the proactive policing exemplified by Vortex. While it may not be possible to field a proactive enforcement strategy that is racially neutral, much of CPD's interaction with the citizenry comes through vehicle stops. The quality, tenor, and tone of such stops are largely under police control. The department should thus pay special attention to training to ensure that these interactions are conducted in a consistent, courteous, and professional manner. Without a concerted effort to ameliorate the disparate impact of these policies, it seems likely that black Cincinnati residents will remain less satisfied with policing services than will their white counterparts.

Abbreviations

ACLU	American Civil Liberties Union
ANCOVA	analysis of covariance
ANOVA	analysis of variance
CAD	computer-aided dispatch
CBD	Central Business District
CI	confidence interval
CPD	Cincinnati Police Department
DOJ	U.S. Department of Justice
DST	daylight saving time
ETS	Employee Tracking System
fdr	false-discovery rate
IIS	Internal Investigations Section
MVR	mobile video recorder
SR	state route

CHAPTER ONE

Introduction

The Collaborative Agreement

In 2002, the City of Cincinnati and other parties (collectively, the parties) entered into a collaborative agreement that sought to achieve the following goals:

- Ensure that police officers and community members become proactive partners in community problem solving.
- Build relationships of respect, cooperation, and trust within and between police and communities.
- Improve education, oversight, monitoring, hiring practices, and accountability of the Cincinnati Police Department (CPD).
- Ensure fair, equitable, and courteous treatment for all.
- Create methods to establish the public's understanding of police policies and procedures and recognition of exceptional service in an effort to foster support for the police (*In re Cincinnati Policing*, S.D. Ohio, 2003, pp. 3–4).

An independent team monitors the collaborative agreement and a separate memorandum of agreement between CPD and the U.S. Department of Justice (DOJ) on the use of force. The monitor team, headed by Saul Green, tracks the parties' implementation of necessary reforms, changes, and procedures. A U.S. magistrate conciliates disagreements between the monitor team's judgments and the parties.

Evaluation of Progress Toward the Collaborative Agreement's Goals

Under the terms of the collaborative agreement, the parties are required to evaluate the agreement's impact. Indeed, the collaborative agreement itself notes, "this Agreement is outcome oriented, putting great emphasis on objective measures of police-citizen relations and police effectiveness" (*In re Cincinnati Policing*, p. 4). RAND was retained in July 2004 to conduct the required evaluations and assist the parties with measuring progress toward the goals of the collaborative agreement. RAND combines the evaluation's individual elements, referred to as *tasks*, into an annual report. RAND's third annual report was due in draft form to the parties on October 1, 2007, and in final form in December 2007.

This is the third of five annual reports that will be produced as part of the evaluation. Table 1.1 provides information about the content of past, current, and future reports. The year-three report provides an analysis of the outcomes and characteristics of motorist stops.

Table 1.1
Schedule of Reports and Content

	Report Year				
Task	**1**	**2**	**3[a]**	**4**	**5**
Incident year(s) covered by CPD data[b]	2003[c], 2004	2005	2006	2007	2008
Community-satisfaction survey	Yes	No	No	Yes	No
Motorist-stop data	Yes	Yes	Yes	Yes	Yes
Audio and video analysis	Yes	Yes	Yes	Yes	No
CPD staffing	Yes	No	No	No	No
Problem-solving processes	Yes	No	No	No	No
Police-citizen interaction survey	Yes	No	No	No	No
Complaint process	Yes	Yes	No	Yes	No
Officer survey	Yes	Yes	No	Yes	No

NOTES: Shaded cells indicate future reports.

[a] Indicates the reporting year covered by this document.

[b] CPD provides data on statistical compilations, staffing, and motor-vehicle stops, as well as tapes of motor-vehicle stops. RAND collected all other data directly in the year of the report.

[c] Both 2003 and 2004 data were used for the motor-vehicle stop task only.

In addition, the report analyzes data from audio and video recordings of motor-vehicle stops. As always, the report uses as context statistical compilations provided by CPD about crime, deployment, and other issues. This latter task is not reflected in Table 1.1.

Statistical Compilations

The statistical compilations address a range of topics, including arrests and reported crimes by neighborhood; vehicle stops and citation, search, and arrest rates by neighborhood; use-of-force incidents by neighborhood; and calls for service by neighborhood. RAND reviews the compilations each year to help establish the context of policing in Cincinnati, including how CPD allocates resources, the demand for police services, and how these factors vary relative to the racial composition of Cincinnati's neighborhoods.

In this way, the statistical compilations provide important inputs into other tasks of the contract. For example, the compilations reveal that crime tends to be clustered in specific parts of the city during certain times of the day and week. In turn, this means that law-enforcement presence is going to be clustered in space and time in a way that correlates with the crime patterns. Other tasks, such as the traffic-stop analyses, must take into account these clustering patterns, since the risk of exposure to law enforcement is not uniform over time and space.

Traffic-Stop Analysis

The analysis of traffic-stop patterns investigates whether racial biases influence police activities in the decision to stop, cite, and search vehicles in Cincinnati. This analysis is conducted in each year of the contract in three parts. Part one assesses vehicle stops and whether a pattern of racial disparity exists at the department level. Part two develops and applies internal bench-

marks to look for patterns of racial disparity at the individual officer level. Part three assesses whether racial disparities exist in stop outcomes, including such factors as the rates at which officers give citations, stop durations, and the rates at which officers initiate vehicle or personal searches. The traffic-stop analyses are conducted through analysis of data that CPD provided to RAND. This section of the evaluation did not require the collection of any original data through surveys or other means.

Evaluation of Video and Audio Records

We analyze audio and video recordings from cameras mounted in CPD patrol cars to shed light on the origins of police-community conflict and dissatisfaction. Analysis of the video and audio recordings allows us to understand how verbal and nonverbal cues are interpreted and misinterpreted and, in turn, identify opportunities to train officers (and, to a much lower extent, citizens) on how to spot relevant cues and reduce misinterpretation of benign cues. For each year of the evaluation contract, the authors expect to sample 300 videotapes of motor-vehicle stops.

Structure of This Report

The balance of this report is organized around the tasks presented previously. Chapter Two reviews the statistical compilations that Cincinnati provided, including their relevance for the other tasks of the evaluation. Chapter Three presents the findings from the traffic-stop analysis. In Chapter Four, we assess the results of the videotaped interactions of police and motorists. Chapter Five integrates the material from the preceding chapters to highlight issues relevant to the collaborative agreement.

CHAPTER TWO

The Context of Policing in Cincinnati: Crime, Arrests, and Use of Force

Overview

CPD has slightly more than 1,000 sworn officers responsible for policing the city of 330,000 residents. CPD administers police services through five districts, which are further subdivided into neighborhoods for a citywide total of 53 neighborhoods.

This chapter describes the relationship between demand for police services, law-enforcement activity, and the racial composition of neighborhoods. CPD spends much of its law-enforcement effort, as measured by such actions as arrests and citations, on a few neighborhoods. These neighborhoods also have the greatest demand for police, as measured by calls for service and reports of crime. The residents of these areas, such as Over-the-Rhine and Pendleton,[1] are predominantly black. This leads Cincinnati's black residents to be more exposed to both crime and aggressive (even if necessary) police tactics, which can lead to a negative perception of the police.

Using data from CPD on calls for service, reported crime, arrests, and use-of-force incidents, this chapter sets the context for the remainder of the report, providing a description of the spatial distribution of incidents, the concentration of law-enforcement effort, and crime in particular neighborhoods.

The key findings of this chapter are as follows:

- Crime, calls for service, and arrests were geographically clustered in the same areas of the city of Cincinnati.
- The residents of the neighborhoods most exposed to police are predominantly black, making the black residents of Cincinnati more likely than white residents to be involved in or witness a negative interaction with the police.
- Overall crime rates were nearly unchanged between 2005 and 2006. Downtown and Over-the-Rhine had large reductions in crime, but increased crime in other neighborhoods, such as East Price Hill and Walnut Hills, offset these gains.
- The number of arrests in the Over-the-Rhine neighborhood increased by 9 percent between 2005 and 2006, on top of a 25 percent jump between 2004 and 2005. The increase in arrests coincides with the implementation of the Over-the-Rhine task force in April 2006.

[1] Over-the-Rhine and Pendleton are two neighborhoods adjacent to and just north of Cincinnati's downtown.

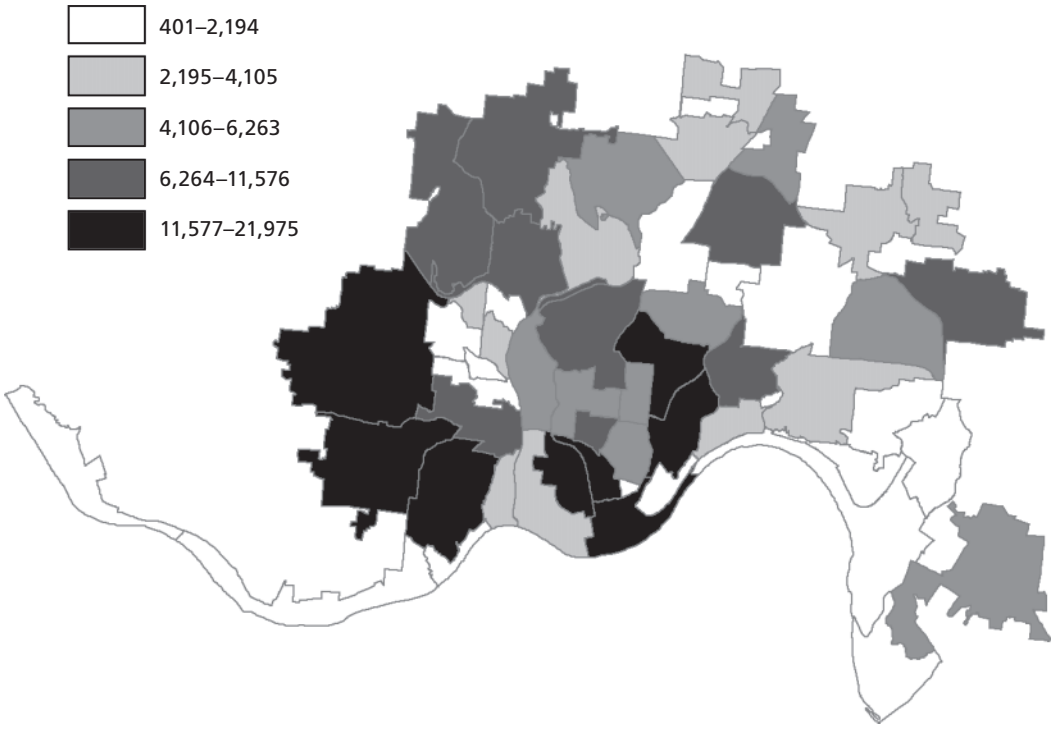
- Crime rates in Over-the-Rhine dropped after April 2006 by 13 percent more than would be expected, given the trends elsewhere in the city and the trend in Over-the-Rhine prior to April 2006.
- The rate of use-of-force incidents per arrest remained the same as in 2005, 14 uses of force per 1,000 arrests.
- There was no relationship between the type of force used and the subject's race.
- The race of the officer involved also appears to be unrelated to the subject's race.

Calls for Service and Serious Crimes

Figure 2.1 shows the number of calls for service by neighborhood for 2006. The areas with the greatest calls for service correspond to areas that CPD has identified as hot spots (CPD, 2007). The Over-the-Rhine neighborhood accounted for 21,975 calls for service, 5 percent fewer than in 2005. However, citywide, the total number of calls for service increased in 2006 by 7 percent. Several neighborhoods had large increases in the number of calls, including Westwood and East Price Hill (both with 14 percent increases) and West Price Hill (with an 11 percent increase in calls for service).

Figure 2.2 shows the number of part 1 crimes (murder, rape, robbery, aggravated assault, burglary, larceny, and automobile theft) by neighborhood for 2006. Overall, part 1 crimes are

Figure 2.1
Calls for Service, by Neighborhood, 2006



SOURCE: CPD (2007).

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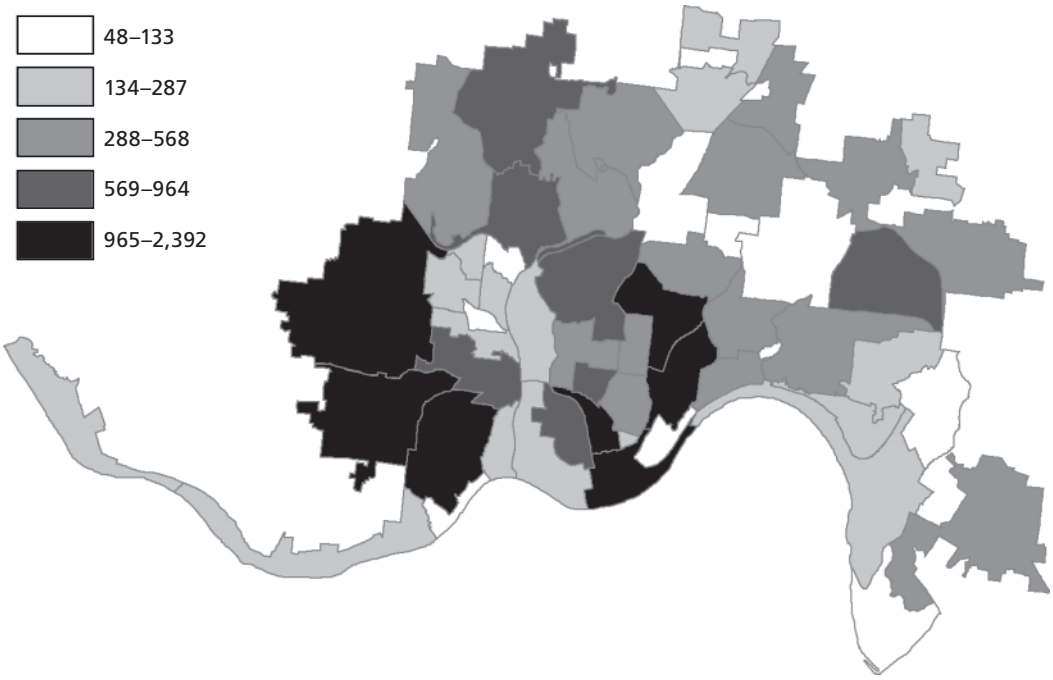
Figure 2.2
Part 1 Crimes, by Neighborhood, 2006



SOURCE: CPD (2007).
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down marginally by 1.5 percent. Some neighborhoods had large reductions in crime, including Downtown and Over-the-Rhine by 23 percent and 19 percent, respectively. Crime increased in East Price Hill by 10 percent and in Walnut Hills by 18 percent, offsetting the reductions in other neighborhoods.

Stops, Citations, Arrests, and Reported Crimes

Table 2.1 shows the number and percentage of arrests, reported crimes, and calls for service by neighborhood. Reported crimes may include part 1 crimes but also include reports of harassment, domestic-violence misdemeanors, and public indecency. The first five neighborhoods listed in the table comprised 45 percent of CPD arrests and 24 percent of Cincinnati's reported crimes. The largest share of arrests occurred in Over-the-Rhine, Central Business District (CBD)/Riverfront, and East Price Hill. In 2006, the number of arrests in Over-the-Rhine increased by 9 percent, this on top of a 25 percent jump between 2004 and 2005. At the same time, the number of reported crimes has decreased by 16 percent, on top of a 5 percent drop between 2004 and 2005.

The establishment of the Over-the-Rhine task force in April 2006 is the likely cause for the large increase in arrests in Over-the-Rhine. The task force implemented a zero-tolerance, saturation patrol approach to target street crimes, drug sales, and quality-of-life offenses. Figure 2.3 charts the 2006 average daily number of arrests for the city as a whole and

Table 2.1
Arrests, Reported Crimes, and Calls for Service, by Neighborhood

	Arrests		Reported Crimes		Calls for Service	
Neighborhood	**n**	**%**	**n**	**%**	**n**	**%**
Over-the-Rhine	9,916	20	2,600	6	21,975	7
CBD and Riverfront	3,921	8	2,154	5	16,924	5
East Price Hill	3,164	6	2,582	6	16,985	5
West End	2,915	6	1,483	3	12,817	4
Avondale	2,720	5	1,958	4	14,279	5
Westwood	2,295	5	3,656	8	21,227	7
Walnut Hills	2,025	4	1,982	5	12,751	4
Clifton	1,959	4	987	2	7,195	2
West Price Hill	1,750	4	2,414	6	15,446	5
Evanston	1,151	2	1,005	2	8,202	3
Madisonville	1,097	2	911	2	8,548	3
Mount Auburn	1,033	2	871	2	6,263	2
Northside	1,016	2	1,587	4	11,576	4
South Fairmount	925	2	1,019	2	7,161	2
Fairview	876	2	980	2	6,811	2
Corryville	847	2	749	2	6,227	2
Bond Hill	738	1	840	2	7,460	2
North Avondale	719	1	787	2	5,895	2
Roselawn	662	1	809	2	5,752	2
College Hill	625	1	1,156	3	8,599	3
Oakley	580	1	963	2	6,154	2
Lower Price Hill	579	1	387	1	3,562	1
Mount Airy	576	1	1,106	3	7,005	2
Millvale	536	1	411	1	2,499	1
Winton Hills	491	1	809	2	4,548	1
Clifton and University Heights	487	1	708	2	5,341	2
Fay Apartments	455	1	532	1	2,775	1
Pendleton	427	1	286	1	1,979	1
Paddock Hills	419	1	195	0	1,904	1
Camp Washington	372	1	406	1	4,588	1
Winton Place	371	1	518	1	2,991	1
Queensgate	341	1	324	1	3,619	1

Table 2.1—Continued

	Arrests		Reported Crimes		Calls for Service	
Neighborhood	**n**	**%**	**n**	**%**	**n**	**%**
Kennedy Heights	340	1	370	1	3,016	1
Hyde Park	338	1	566	1	4,105	1
North Fairmount	303	1	286	1	1,677	1
Hartwell	291	1	426	1	3,179	1
East Westwood	281	1	322	1	2,194	1
Mount Washington	255	1	650	1	4,424	1
Pleasant Ridge	231	0	558	1	3,868	1
South Cumminsville	229	0	135	0	1,060	0
Carthage	195	0	404	1	2,978	1
Columbia and Tusculum	183	0	221	1	1,893	1
East Walnut Hills	182	0	568	1	2,939	1
English Woods	176	0	263	1	1,587	1
East End	174	0	288	1	1,972	1
Mount Adams	162	0	158	0	1,485	0
Mount Lookout	150	0	211	0	1,430	0
Sedamsville	144	0	223	1	1,548	0
Sayler Park	142	0	300	1	1,642	1
Riverside	102	0	246	1	1,180	0
California	56	0	72	0	587	0
Linwood	56	0	102	0	906	0
O'Bryonville	18	0	66	0	401	0

SOURCE: Calculated from CPD data sources.

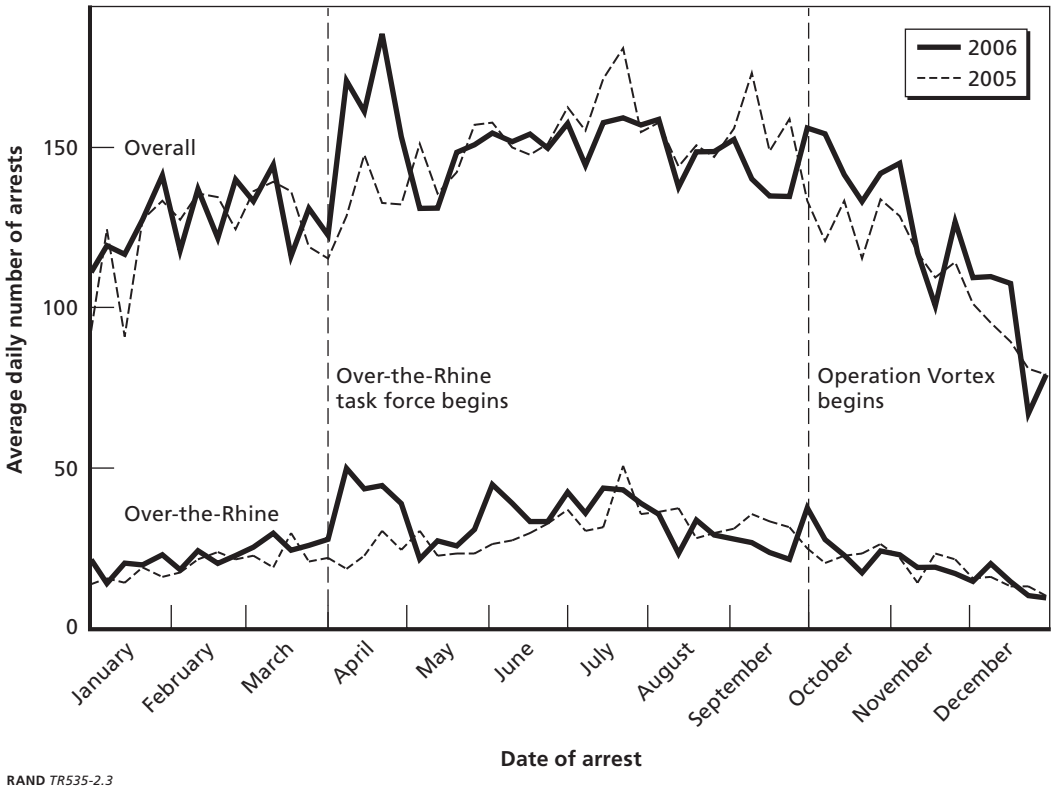
NOTE: The numbers in the percentage columns indicate that neighborhood's share of the city total.

for the Over-the-Rhine neighborhood (heavy line). The arrest rate for 2005 is also included (lighter line). The large increase in arrests appears to be due primarily to the large spike in April following the implementation of the Over-the-Rhine task force. Another jump in arrests occurs in October, coincident with the initiation of Operation Vortex.

Figure 2.4 shows the analogous trends for part 1 crimes. After April, the 2006 crime trend in the Over-the-Rhine neighborhood is consistently below the 2005 rate. Statistical modeling indicates that, after April 2006, there was a 13 percent (95 percent confidence interval [CI] [–2 percent, 26 percent]) reduction in crime relative to what we would have expected, given general crime trends in Cincinnati.[2] This analysis cannot separate the effect of the Over-

[2] We fit a Poisson regression model with the weekly number of crimes as the outcome and with a week × Over-the-Rhine interaction term and a year × Over-the-Rhine × post-April interaction term. The exponentiated coefficient of the latter term

Figure 2.3
Arrest Trends in 2006



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the-Rhine task force from other changes in that neighborhood that might have coincided with the implementation of the task force.

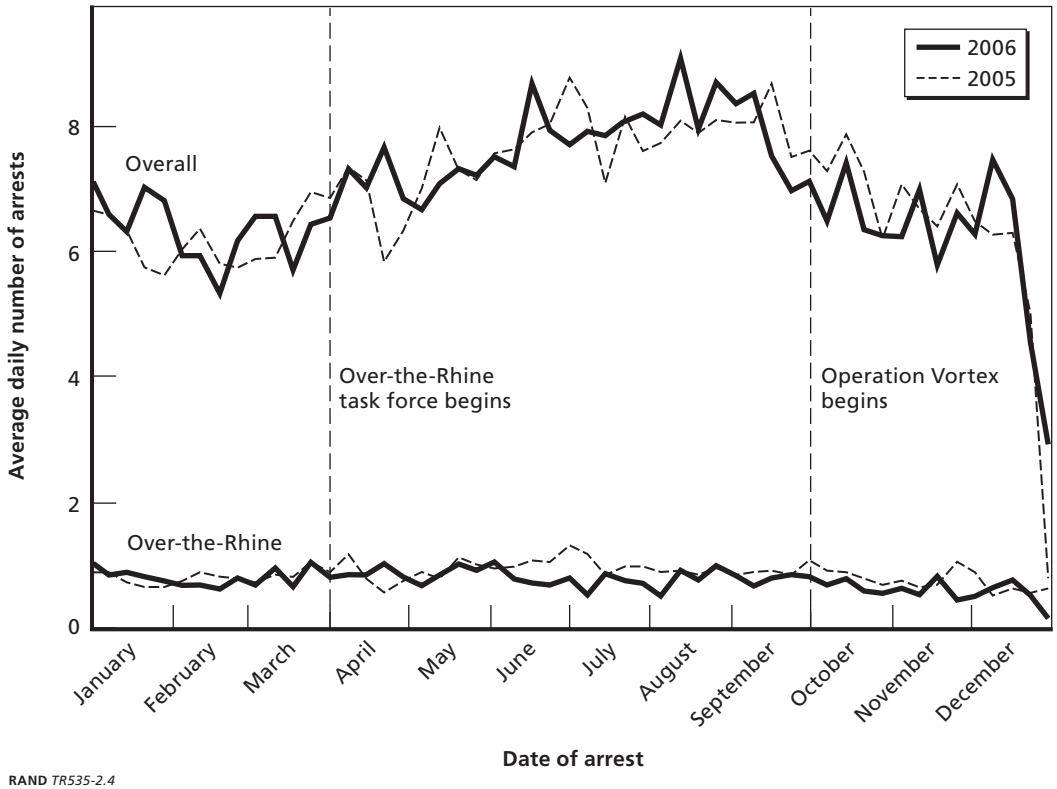
Table 2.2 shows the number of motor-vehicle stops and the citation rate, search rate, and arrest rate of those stops by neighborhood. The number of stops depends on many factors, including the number of police, the volume of traffic, and the rate of offending in the neighborhood. Millvale and Fay Apartments, adjacent neighborhoods, have high rates of arrest following traffic stops. Over-the-Rhine continues to have a large number of arrests (9,916), a large number of traffic stops (2,975), a large number of arrests following traffic stops (775), and a high arrest rate following traffic stops (26 percent). Only I-75 exceeds the Over-the-Rhine neighborhood in the number of traffic stops. Citation and search rates varied widely across the neighborhoods, 42 percent to 93 percent for citation rates and 2 percent to 28 percent for search rates.

Use of Force

Many of the points in the collaborative agreement and the DOJ memorandum of agreement pertained to use of force. These included restructuring CPD's use-of-force policies, training, documentation, and investigations. RAND obtained data on use-of-force incidents

minus 1 gives the relative reduction in crime rates.

Figure 2.4
Part 1 Crime Trends in 2006



RAND *TR535-2.4*

occurring in 2006. Our analysis assumes that these records are a complete inventory of use-of-force incidents. TASER®-weapon incidents are electronically recorded on the device so that a complete accounting of TASER-weapon discharges is easy to verify.[3] Some incidents may not be reported, but several policies and practices (e.g., mobile video recorders [MVRs] in all cars, a rigorous civilian complaint process) reduce the risk of incidents going unreported.

For each incident, data included the incident date, the incident location (address or intersection), race and sex of the individual involved, identifiers for the officers involved in the incident, the officers' races, the reason or charge that led to force, and the type of force used. The data we received derive from CPD's Employee Tracking System (ETS) and records the severest type of force according to a hierarchy. We recategorized some stops based on readings of the incident descriptions. Uses of chemical irritants recorded in injury-to-prisoner incidents have been recoded as chemical-irritant incidents. Descriptions of incidents labeled in ETS as use-of-force investigations were recoded to the type of force described in the incident (one firearm-discharge incident, nine hard-hand incidents (e.g., palm and fist strikes, kicks, knee thrusts), and 10 TASER-weapon incidents; for two incidents, we did not have incident details).

In 2006, there were 715 use-of-force incidents in Cincinnati excluding incidents involving canine bites. Table 2.3 summarizes the number of use-of-force incidents, by type and race, that occurred in 2006. TASER-weapon discharges are the most commonly used type of force and account for 72 percent of the incidents (n = 513). There is no significant difference in the

[3] TASER® is a registered trademark of TASER International, Inc.

Table 2.2
Motor-Vehicle Stops and the Citation, Search, and Arrest Rates, by Neighborhood (Sorted by Arrest Rate)

Neighborhood	Stops	Citations (%)	Searches (%)	Arrests (%)
Millvale	675	57	33	28
Fay Apartments	327	66	25	26
Over-the-Rhine	2,975	60	38	26
Winton Hills	340	61	21	26
Avondale	1,636	65	37	25
Pendleton	198	58	32	25
North Fairmount	259	56	26	24
State Route (SR)-126[a]	17	71	12	24
East Price Hill	1,861	55	25	23
South Cumminsville	360	61	29	22
Mount Auburn	744	64	29	20
West End	1,491	61	25	20
Winton Place	711	68	14	20
Corryville	879	62	20	19
East Westwood	559	55	19	19
English Woods	216	58	22	19
Evanston	1,295	58	20	19
Paddock Hills	267	68	25	19
West Price Hill	1,657	54	18	19
Bond Hill	859	76	20	18
Madisonville	657	65	26	17
North Avondale	658	66	25	17
Northside	1,917	66	14	17
South Fairmount	2,022	59	17	17
Mount Airy	973	68	15	16
Walnut Hills	1,663	69	18	16
Camp Washington	979	71	17	15
Kennedy Heights	81	64	17	15
College Hill	1,035	69	13	14
Pleasant Ridge	159	74	18	14
Roselawn	529	70	14	14
East Walnut Hills	403	64	15	13

Table 2.2—Continued

Neighborhood	Stops	Citations (%)	Searches (%)	Arrests (%)
Carthage	285	78	15	12
Westwood	2,344	66	11	12
Clifton and University Heights	1,246	65	12	11
Fairview	1,035	67	13	11
Lower Price Hill	1,047	70	12	11
Sedamsville	400	76	8	10
SR-562	128	81	9	10
Hartwell	361	78	8	9
Oakley	569	73	12	9
Queensgate	556	77	13	9
CBD and Riverfront	1,797	71	10	8
Clifton	1,975	70	7	8
I-75	4,836	89	7	7
Mount Washington	202	65	8	7
East End	745	83	6	6
I-71	2,026	89	6	6
Sayler Park	163	68	5	6
Columbia and Tusculum	645	85	5	5
Mount Adams	295	79	5	5
O'Bryonville	153	74	6	5
Hyde Park	585	69	5	4
Mount Lookout	235	82	6	4
Riverside	405	71	3	4
I-74	780	88	4	3
I-275	266	93	3	2
I-471	42	60	5	2
Linwood	374	89	2	2
California	12	42	8	0
Total	51,974	69	16	14

SOURCE: 2006 contact cards.

[a] We had no arrest data on highways, which is why they appear in this table and not Table 2.1.

type of force used by race, though black suspects are slightly more likely to be the target of a TASER weapon, while white suspects are more likely to be sprayed with a chemical irritant or be physically taken down by officers (p-value = 0.14). Black suspects are approximately 75

Table 2.3
Use-of-Force Incidents by Race in 2006

	Black		White		Other		
Type of Force	n	%	n	%	n	%	Total
Firearm discharge[a]	1	0	0	0	0	0	1
TASER[b]	394	74	111	66	8	61	513
Pepper ball	0	0	0	0	1	8	1
Chemical irritant[c]	22	4	13	8	3	23	38
Strikes[d]	8	1	1	0	0	0	9
Noncompliant suspect or arrestee[e]	107	20	43	25	1	8	151
Internal Investigations Section (IIS)[f]	2	0	0	0	0	0	2
Total	534	100	168	100	13	100	715

NOTE: The table does not include 12 incidents of weapon discharges at animals (TASER weapons and firearms). One hundred sixty-four injury-to-prisoner incidents are not included in this table because the incident description indicated that officers used no force in the incident. Canine deployments are not included. The percentages show, within race, the share of each type of force.

[a] This firearm discharge is recorded as a use-of-force investigation in ETS. The incident involved two officers returning fire at an armed suspect after one of the officers was shot.

[b] Ten of these TASER-weapon discharges are coded as use-of-force investigations in ETS.

[c] Thirteen chemical-irritant uses are coded as injury-to-prisoner incidents in ETS.

[d] These palm and fist strikes, kicks, and knee thrusts are coded as a use-of-force investigation in ETS.

[e] Noncompliant suspect or arrestee incidents involve balance-displacement takedowns or physical restraint. Thirty-three of these are coded as injury-to-prisoner incidents in ETS.

[f] Details of these use-of-force investigations are with IIS.

percent of the subjects of use-of-force incidents, the same as the percentage of 2006 arrestees who are black.

Table 2.4 shows the number of use-of-force incidents, broken down by type and neighborhood. Over-the-Rhine has the largest number of use-of-force incidents with 116, accounting for 16 percent of Cincinnati's total. One incident occurred outside of the city limits.

Table 2.4 also shows the rate of uses of force per 1,000 arrests. Citywide, there were, on average, 14 use-of-force incidents per 1,000 arrests, unchanged from the 2005 rate and down from 20 per 1,000 in 2004. The table orders the neighborhoods by the rate of use of force per 1,000 arrests; however, statistically, the ordering is very sensitive to random changes, so year to year, these rankings could vary greatly. Several neighborhoods have rates that greatly exceed the citywide rate; however, most of these neighborhoods had few arrests, so the rates are highly sensitive to small changes in the number of use-of-force incidents and arrests. Avondale had a large number of both arrests (2,720) and use-of-force incidents (55). Over-the-Rhine also had a large number of arrests, but in 2006 had a rate of use of force lower than the citywide average.

Table 2.5 compares the distribution of the officers' and subjects' races. For example, of the use-of-force incidents involving black subjects, the officer in the incident was white in 69 percent of the incidents. For use-of-force incidents involving white subjects, the prevalence of white officers is 74 percent. Since the rate at which white officers are involved in use-of-

Table 2.4
Use-of-Force Incidents, by Neighborhood and Type

Neighborhood	Firearm Discharge	TASER or Pepper Ball[a]	Chemical Irritant	Strikes	Noncompliant Suspect or Arrestee	IIS	Total Number of Incidents	Neighborhood Share of Incidents (%)	Arrests	Use of Force per 1,000 Arrests
Sedamsville	0	7	0	0	1	0	8	1	144	56
East End	0	5	2	0	1	0	8	1	174	46
Mount Lookout	0	4	2	0	0	0	6	1	150	40
Linwood	0	0	1	0	1	0	2	0	56	36
Clifton and University Heights	0	7	2	0	5	0	14	2	487	29
Northside	0	19	1	0	8	0	28	4	1,016	28
English Woods	0	2	0	0	2	0	4	1	176	23
South Fairmount	0	18	0	0	3	0	21	3	925	23
Corryville	0	12	3	0	4	0	19	3	847	22
College Hill	0	10	0	0	4	0	14	2	625	22
East Westwood	0	6	0	0	0	0	6	1	281	21
Mount Airy	0	8	0	0	4	0	12	2	576	21
Bond Hill	1	12	1	0	1	0	15	2	738	20
Avondale	0	43	3	0	8	1	55	8	2,720	20
Roselawn	0	12	0	0	1	0	13	2	662	20
Walnut Hills	0	30	2	0	7	0	39	5	2,025	19
Lower Price Hill	0	9	1	0	1	0	11	2	579	19

Table 2.4—Continued

Neighborhood	Firearm Discharge	TASER or Pepper Ball[a]	Chemical Irritant	Strikes	Noncompliant Suspect or Arrestee	IIS	Total Number of Incidents	Neighborhood Share of Incidents (%)	Arrests	Use of Force per 1,000 Arrests
Madisonville	0	13	0	1	5	0	19	3	1,097	17
North Avondale	0	11	0	0	1	0	12	2	719	17
Winton Hills	0	5	0	0	3	0	8	1	491	16
Camp Washington	0	6	0	0	0	0	6	1	372	16
Fairview	0	7	1	0	6	0	14	2	876	16
West End	0	26	5	1	14	0	46	6	2,915	16
Mount Washington	0	1	1	0	2	0	4	1	255	16
Mount Auburn	0	13	0	1	2	0	16	2	1,033	15
Fay Apartments	0	6	0	0	1	0	7	1	455	15
Millvale	0	7	1	0	0	0	8	1	536	15
Sayler Park	0	2	0	0	0	0	2	0	142	14
Oakley	0	8	0	0	0	0	8	1	580	14
West Price Hill	0	16	1	0	5	1	23	3	1,750	13
Pleasant Ridge	0	3	0	0	0	0	3	0	231	13
Mount Adams	0	2	0	0	0	0	2	0	162	12
Westwood	0	21	0	0	7	0	28	4	2,295	12
Pendleton	0	4	0	0	1	0	5	1	427	12
Over-the-Rhine	0	80	7	5	24	0	116	16	9,916	12

Table 2.4—Continued

Neighborhood	Firearm Discharge	TASER or Pepper Ball[a]	Chemical Irritant	Strikes	Noncompliant Suspect or Arrestee	IIS	Total Number of Incidents	Neighborhood Share of Incidents (%)	Arrests	Use of Force per 1,000 Arrests
East Price Hill	0	23	2	0	11	0	36	5	3,164	11
East Walnut Hills	0	1	1	0	0	0	2	0	182	11
Evanston	0	8	1	0	3	0	12	2	1,151	10
Carthage	0	2	0	0	0	0	2	0	195	10
Riverside	0	1	0	0	0	0	1	0	102	10
CBD and Riverfront	0	28	0	1	8	0	37	5	3,921	9
Queensgate	0	2	0	0	1	0	3	0	341	9
North Fairmount	0	1	0	0	1	0	2	0	303	7
Kennedy Heights	0	2	0	0	0	0	2	0	340	6
Winton Place	0	1	0	0	1	0	2	0	371	5
South Cumminsville	0	1	0	0	0	0	1	0	229	4
Clifton	0	5	0	0	2	0	7	1	1,959	4
Hartwell	0	1	0	0	0	0	1	0	291	3
Paddock Hills	0	0	0	0	1	0	1	0	419	2
California	0	0	0	0	0	0	0	0	56	0
Columbia and Tusculum	0	0	0	0	0	0	0	0	183	0
O'Bryonville	0	0	0	0	0	0	0	0	18	0
Hyde Park	0	0	0	0	0	0	0	0	338	0

Table 2.4—Continued

Neighborhood	Firearm Discharge	TASER or Pepper Ball[a]	Chemical Irritant	Strikes	Noncompliant Suspect or Arrestee	IIS	Total Number of Incidents	Neighborhood Share of Incidents (%)	Arrests	Use of Force per 1,000 Arrests
I-71	0	0	0	0	1	0	1	0	—	—
I-74	0	1	0	0	0	0	1	0	—	—
I-75	0	1	0	0	0	0	1	0	—	—
I-275	0	0	0	0	0	0	0	0	—	—
I-471	0	0	0	0	0	0	0	0	—	—
SR-126	0	0	0	0	0	0	0	0	—	—
SR-562	0	0	0	0	0	0	0	0	—	—
Outside Cincinnati[b]	0	1	0	0	0	0	1	0	—	—
Total	1	514	38	9	151	2	715	100	49,640	14

[a] The single pepperball usage occurred in Corryville.

[b] We had data for outside Cincinnati only for use-of-force incidents, which is why it appears here and not in Tables 2.1 and 2.2.

Table 2.5
Distribution of Officers' Races, by Subjects' Races

	Officer's Race (%)				
Subject's Race	**Black**	**White**	**Black and White**	**Other**	**Total**
Black (n = 534)	23	69	5	2	100
White (n = 168)	16	74	8	1	100
Other (n = 13)	23	46	23	8	100

NOTE: Includes only chemical-irritant, firearm-discharge, strike, takedown-of-noncompliant-suspect-or-arrestee, TASER, and pepper-ball incidents.

force incidents does not vary by the subject's race, this suggests that there is no evidence that white officers use force more frequently against black suspects. That is, the races of the officers involved in incidents do not appear to differ for black and white subjects (p-value = 0.10).

Summary

As we noted in our previous reports, patterns of calls for service, reported crime, arrests, and police use of force are geographically clustered in Cincinnati. Neighborhoods that are afflicted by a high volume of crime are also more likely to have a high volume of arrests and police use-of-force incidents. Over-the-Rhine, Avondale, West End, Downtown, East Price Hill, and Walnut Hills appear to be neighborhoods that crime and police interventions (e.g., stops, arrests, and use of force) disproportionately affect. As a result, these neighborhoods' residents are likely to be exposed to negative interactions with police, either personally or by witnessing an arrest or use-of-force incident in their neighborhood.

CHAPTER THREE

Analysis of Vehicle Stops

Overview

This chapter examines data on traffic stops from 2006 to assess whether the data indicate racial profiling on the part of CPD officers. Our approach involves three phases: (1) an assessment of whether there is a departmentwide pattern of bias against black drivers in the decision to stop a vehicle; (2) an assessment of the fraction of CPD officers who disproportionately stop black drivers compared to other officers patrolling the same neighborhoods at the same time; and (3) an assessment of racial biases in post-stop outcomes, including citation rates, stop duration, and search rates.

Note that, in this chapter, each of the analyses removes the effect of other plausible explanations for differences. This includes adjustments for when, where, and why stops occur. The aim is to isolate race's effect from that of other factors on the decision to stop, cite, and search vehicles. Even though these analyses find few differences between black and similarly situated nonblack drivers, this should not minimize the fact that black drivers in Cincinnati are exposed to more policing and are likely to be stopped in situations that are more likely to result in longer stops, searches, and generally negative interactions. Nonblack drivers in those same areas may be treated identically, but, across the city, black and nonblack drivers collectively will have different experiences. The analysis of videotaped interactions in Chapter Four more directly studies those differential experiences.

The key findings are as follows:

- An analysis of stops occurring near the changes to and from daylight saving time (DST) found a substantial drop from prior years in the rate of black drivers being stopped during daylight, when drivers' races are more visible. Changes in enforcement patterns in 2006 may explain this change. The trend across the past four years suggests no evidence of racial profiling in officers' decisions to stop drivers.
- While we did not find departmentwide evidence of racial bias, a few officers seemed to have stop activity consistent with racially biased policing. Three officers out of 294 officers stopped black drivers at substantially higher rates when compared with stops of similarly situated individuals made by other officers. Two officers appeared to be stopping more nonblack drivers than did similar officers.
- While stops of black drivers took longer, on average, than stops for white drivers, when differences in other characteristics of the stops were accounted for (e.g., location and time of stop, reason for stop), the stops were of similar duration. Black drivers and similarly situated nonblack drivers both had a 47 percent chance of having a stop lasting less than

10 minutes. Black drivers were significantly less likely than similarly situated nonblack drivers to have a stop exceeding 30 minutes.

- Black drivers received citations less frequently than similarly situated nonblack drivers (63 percent compared with 67 percent). This difference may be due to officers' reluctance to cite black drivers, or it may be an indicator that officers are stopping black drivers for discretionary offenses for which citations are rarely given. A third possibility is that those black drivers who would have received a citation were actually found to be involved in criminal activity and were arrested instead.
- Officers searched black drivers less frequently than matched nonblack drivers when the officers have greater discretion (6.1 percent versus 6.7 percent). The rate of consent searches of matched nonblack drivers increased by 1 percent from the year-two report.
- When officers searched a driver, they were equally likely to recover contraband from black and nonblack drivers.
- Trends in these results in the past three to four years show substantial improvements. When factors such as time and location of the stop are taken into account, we find no evidence of a departmentwide pattern of disparities due to race on several of the key measures: stop rates, search rates, and hit rates.
- A separate analysis of the Over-the-Rhine task force and Operation Vortex, CPD's policing strategy that targets crime hot spots, indicates that stops made by Vortex officers are more likely to involve black drivers than stops made by other officers in the same place and at the same time (71 percent versus 65 percent). Vortex officers made 33 percent of all vehicle stops at these times and places. Vortex officers were equally likely to issue citations to black drivers and white drivers. They were also equally likely to search black drivers and similarly situated white drivers, though their use of high-discretion searches was much greater than that of similarly situated stops made by non-Vortex officers. Unlike non-Vortex officers, when conducting searches, Vortex officers were significantly more likely to recover contraband from white drivers than from black drivers.

Introduction

This chapter investigates whether racial biases influence police activities in the decision to stop, cite, and search vehicles in Cincinnati. We develop this assessment in three stages. The first stage assesses whether a racial pattern exists at the department level in initiating vehicle stops. The second stage assesses whether individual officers appear to have racial biases in their decisions to stop. The third stage assesses whether there are racial disparities in the outcomes of stops (citation, duration, searches).

First, to assess bias in the decision to stop, we took advantage of a natural experiment, comparing stops made during darkness to stops made during daylight. If there is a racial bias, that bias will be most prevalent during daylight hours, when drivers' races are most visible. In the absence of racial bias, we expect the percentage of black drivers among drivers stopped during daylight to equal the percentage of black drivers among those stopped in darkness. Since the racial composition of the driving population may change between daylight and darkness, we compare stops immediately before and immediately after changes to and from DST. On one Monday, it is light at 6:30 p.m., and the following Monday, it is dark at 6:30 p.m. Such comparisons help account for the changes in the racial distribution of the driving population

throughout the day. As a result, it does not require explicit information on the characteristics of drivers at risk of being stopped.

Second, we implemented an internal benchmark, comparing each officer to other officers who patrol the same neighborhoods at the same times and with the same assignment. This method selects an officer, identifies stops that other officers made in the same time and place, and compares the racial distributions of the stopped drivers. Since the officers are patrolling the same areas at the same times, the racial distributions should be the same (assuming that the officers are on the same assignment). We report estimates of the percentage of officers who appear to stop drivers of one race disproportionately.

Third, we analyzed stop outcomes, citation rates, stop duration, search rates, and search outcomes, to assess racial bias in actions taken post-stop. To isolate the effect of racial bias in the stop outcomes, we statistically removed the effects of when, where, and why the stop took place.

In the past year, there has been particular scrutiny of CPD's Vortex strategy, the use of specially designated teams of officers to step up police presence and enforcement activities in crime hot spots, and its effect on police-community relations. We have included an analytical component to this chapter that compares stops made by officers in the Vortex unit with stops made by non-Vortex officers. We compare the racial distributions of the stops (matching on time, place, and other factors) and patterns in the stop outcomes.

Data

Contact Cards

CPD's investigatory-stop policy requires officers to complete Form 534, a citizen contact card, for all motor-vehicle stops. In addition, for any passenger detained separately, the officer must complete a separate Form 534. The contact cards include information on the vehicle (license plate, car make, and year), the driver (race, age, driver's license), passengers, and the stop (stop location, stop reason, whether a search occurred, stop outcome, stop duration). CPD officers also completed contact cards for some pedestrian stops, collecting information on the individual detained and on stop attributes. Our analyses rely primarily on the data from a database that CPD created from these contact cards for the 2006 calendar year.

Stop Location

As of April 2006, CPD began recording the policing block in which the stop occurred and implemented more rigorous checks on address validity. Policing-block numbers correspond to one of 504 small geographic areas of the city, a resolution of the stop location much finer than the 53 neighborhoods used in our analyses for 2003–2005. For stops prior to April 2006, we geocoded each stop's address or intersection as documented on the contact cards to a policing block. For any stop that occurred on a highway (interstates 275, 471, 71, 74, and 75, SR-126 [Ronald Reagan Cross County Highway], and SR-562 [Norwood Lateral]) we coded as unique locations, replacing their policing-block labels with highway identifiers. Ultimately, we could identify the policing block in which the stop occurred in all but 65 of the moving violations, a match rate of 99.9 percent of the stops. This rate continues to show improvement over rates from 2003, 2004, and 2005 (97.1, 98.3, and 99.3 percent, respectively).

Completion Rates and Missing Entries

We received data on 55,336 stops in 2006 (51,974 stops for motor-vehicle violations). For closer inspection of the completion rates, we obtained computer-aided dispatch (CAD) logs from CPD. These CAD logs indicate the date and time of stop initiation, the stop's completion time, the stop location (address, policing block, and district), disposition, and an incident number. In 2006, CPD recorded 35,369 traffic stops in CAD, a number much smaller than the 54,319 stops recorded in CAD in 2005. For every traffic stop, CPD officers radio dispatch indicating that they are involved in a traffic stop and unavailable to be redeployed elsewhere. All stops recorded in CAD should have an associated contact card (Form 534) giving additional stop details. We utilized the CAD log data both to supplement the geocoding effort identifying the stop locations and to check whether incident numbers in the CAD logs had matching contact cards (which would help us estimate the contact-card completion rate).

Contact-Card Completion Rates. To assess contact-card completeness, we attempted to match each CAD record with a contact card.

- We could directly match 84.3 percent of CAD records with completed contact cards.
- When matching stops with incident numbers that were off by one or two digits but had matching districts, dates, and occurred within 30 minutes of the CAD record, we found that 90.3 percent of CAD records had completed contact cards. See Table 3.1 for the percentage not matched, by district.

This leaves 9.7 percent (3,436) of the stops recorded in the CAD logs as traffic stops that do not have corresponding contact cards, yielding an estimated compliance rate of 90.3 percent. There are 20,369 contact cards for motor-vehicle violations with seemingly valid incident numbers that do not seem to appear in the CAD logs. These may actually document some of the 3,436 CAD logs without matching contact cards, but they cannot be readily matched, possibly due to data-entry errors on the incident number and at least one of the district, date, or time variables. As a result, the 90.3 percent compliance rate is a lower bound, and the actual compliance rate is likely to be higher.

Quality of Recorded Data and Missing Attributes of Documented Stops. Items from the contact cards were missing at times. CPD noted that, in the process of upgrading the contact-card database, stop durations were not being recorded in the database. Missing data greatly increased after an October 19, 2005, system upgrade. This affected data on stop durations through March 2006. Table 3.2 shows the percentage of missing stop-duration data by month.

Table 3.1
CAD Records, by District, That Could Not Be Matched to Contact Cards

	District				
Unmatched Records	**1**	**2**	**3**	**4**	**5**
Percent	22	8	4	9	5

Table 3.2
Contact Cards Missing Stop Duration, by Month

Missing Cards	Month											
	Jan.	Feb.	Mar.	Apr.	May	June	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Percent	94	95	70	1	1	1	1	1	0	0	1	1

Missingness of data is problematic only when associated with the value that we would have observed had the data not been missing. For example, if officers do not fill in the stop duration when a stop is very short, dropping stops with missing stop duration would cause us to overestimate the stop lengths. A worse case, for the purposes of RAND's study, occurs when missing data are associated with both stop duration and race. However, neither of these problems is likely to occur, since the cause of missing data is a switch in the database's front end such that a missing stop duration is certainly unassociated with both race and the actual stop duration. As a result, the missing data will not skew the results. The only possible effect is reduced accuracy, but, since 40,000 still have stop duration recorded, the loss of precision will be small.

In 2006, 0.3 percent of stops were missing at least one of the following: stop location, date, time, driver age, race, or sex. In 2005, this figure was 3 percent. Table 3.3 gives some more specific information on the types of fields that are important for RAND's analyses. Table 3.3 also includes a comparison with the 2004 and 2005 rates and, besides the technical error involving lost stop durations, the missing-information rate has greatly decreased.

Assessing Racial Disparities in the Decision to Stop, Using a Natural Experiment

The difficulty in assessing a racial bias in traffic stops is in developing a reasonable expected rate, often known as the *benchmarking problem*. Census data from 2006 report that 44 percent

Table 3.3
Missing Basic Stop Information from Motor-Vehicle Violations

Stop Feature	Missing (2006)		Missing (2005) (%)	Missing (2004) (%)
	n	%		
Date	0	0.0		
Time	89	0.2	0.2	0.6
Duration	12,360	23.8	20.0	7.5
Location	65	0.1	0.7	1.7
Officer	0	0.0	0.6	1.6
Driver race	11	0.0	0.7	6.0
Driver sex	11	0.0	0.9	6.1
Driver age	15	0.0	1.7	6.9

NOTE: n = 51,974 stops for motor-vehicle violations.

of Cincinnati's residents are black (U.S. Census Bureau, 2006). In 2006, 49 percent[1] of the stops involved black drivers, and, of those stops involving a Cincinnati resident, 58 percent involved a black driver. These differences say little, if anything, about unequal treatment. For example, in the same data set, we found that 67 percent of the drivers stopped were male. Even though this figure differs greatly from the residential rate of 47 percent, we believe that much of this difference is due to men driving in the city more often and being more likely to break traffic laws when they drive rather than officers targeting men; although this too is possible. We must reason in the same fashion when dealing with race rather than sex. We must ask whether something besides racial profiling can explain the difference between the observed rate at which black drivers are stopped and the stop rate expected if there were no bias.

We must account for three factors when comparing the racial distribution of stops. We do not know whether any of the following factors was true in Cincinnati, but the analysis must be able to separate them to assess racial biases.

1. Driving behavior might vary by race. That is, black drivers may be stopped more often because they may be more likely to commit some kind of traffic infraction. This may include expired license plates, speeding, or mechanical violations. Some studies have shown differences by race in speeding (Lange, Blackman, and Johnson, 2002) and seat-belt use (Hallmark, Mueller, and Veneziano, 2004), but we do not know whether this is the case in Cincinnati.
2. Exposure to law enforcement might vary by race. Black drivers may be stopped more often because they are more likely to be exposed to law enforcement. They may drive more often or, more likely, in regions with greater police presence, so that any infraction they make would be more likely to be noticed.
3. Police might be practicing racially biased policing. Black drivers may be stopped more often because officers are actively seeking black drivers to stop. When officers observe vehicles involved in some traffic infraction, they might be more likely to stop the vehicle if the driver is black.

Any method that aims to assess a racial bias in the decision to stop a vehicle must be able to account for or rule out differences resulting from the first two items. Comparisons to the residential census are inadequate, since they do not account for either of the first two reasons. Also, a large fraction of motorists does not even reside in the neighborhood in which police stopped them. In 2006, more than 22 percent of the drivers stopped in Cincinnati were not Cincinnati residents. Several proposed methods aim to assess the racial distribution of drivers on the streets either by posting observers on street corners or by using surrogate measures such as the racial distribution of not-at-fault car crashes. While these methods might adjust for differential police exposure, they do not adjust for different rates of offending. Instead, such methods require the assumption that drivers of each racial group have equal rates of offenses, which may or may not be true. Studies have shown that almost all drivers have some vehicle-code violation while driving (Lamberth, 2003); however, police do not stop vehicles for all violations and are expected to use discretion when selecting certain offenses and certain vehicles for a traffic stop. We aim to assess whether this discretion differentially affects black drivers.

[1] This is nearly the same as the rates in 2003, 2004, and 2005 (48, 49, and 47 percent, respectively).

Methods

To assess racial bias in the decision to stop, we use the veil-of-darkness method described in Grogger and Ridgeway (2006). Fridell (2004, p. 123) also discusses this method, describing it as a method for "benchmarking with data from 'blind' enforcement mechanisms."

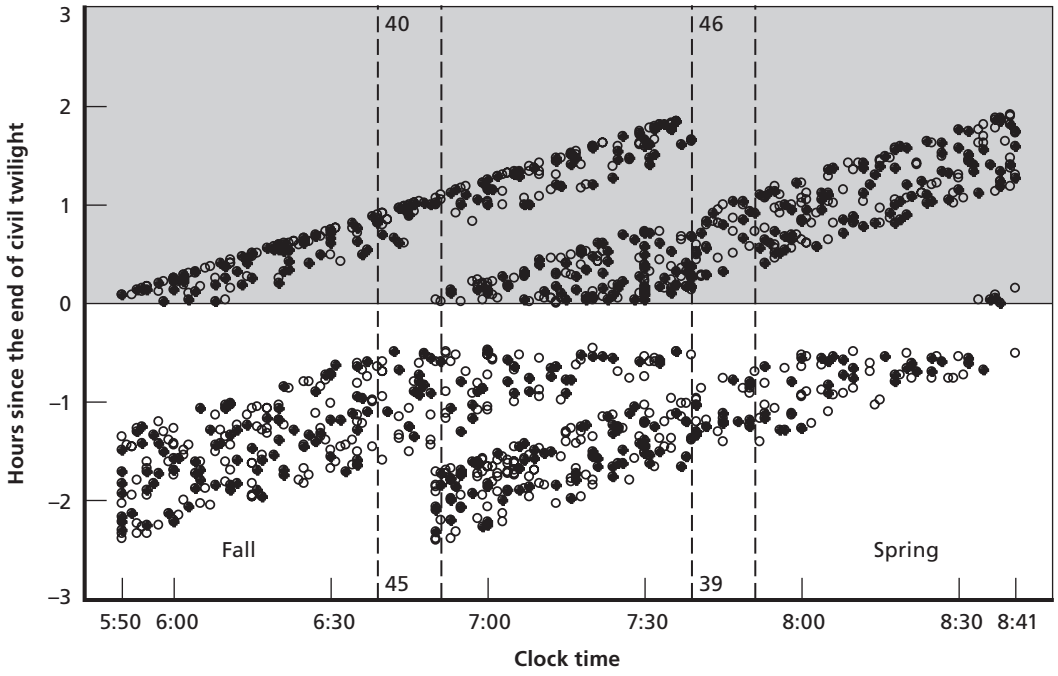
In its basic form, our analysis compares the racial distribution of stops made during daylight to the racial distribution of stops made at night. If there were a practice of targeting black drivers, the effects of this practice would be most pronounced during daylight, when driver race is most visible. While the race of some nighttime drivers might be visible, the rate of police knowing driver race in advance of the stop must be smaller at night than during daylight. An overly simplistic analysis compares the percentage of black drivers among those stopped during daylight with the percentage of black drivers among those stopped at night. However, things might be different during daylight from how they are at night. For example, even if there were no racially biased practices, we still may observe differences in the prevalence of black drivers among those stopped, daytime versus nighttime, if the mix of black and white drivers on the road changes over the course of the day. Differences in work schedules can cause changes in the mix of black and white drivers (Hamermesh, 1996). However, every spring and fall, Cincinnati switches between Eastern DST and Eastern standard time. Around the time these changes occur, on one Monday, it is daylight between 6 p.m. and 6:30 p.m., while the following Monday, it is dark between 6 p.m. and 6:30 p.m. During both of these periods, the authors hypothesized that the mix of black and white drivers on the road would not drastically change, the kinds of drivers who commit offenses for which police make stops would not change, and the patterns of police allocation would not change. The major difference between these two periods is the officers' ability to identify race in advance of the stop. In practice, for such an analysis, we use several weeks of data on either side of the transitions to and from DST. Within short time slices, we compared the prevalence of black drivers among all stopped drivers, daylight versus darkness.

In Figure 3.1, we consider autumn stops occurring between 5:50 p.m. and about 7:39 p.m. During this period, stops may occur in either daylight or darkness depending on the season. Stops before this time window always occur in daylight; after this time window, they are always in darkness. This time window is the intertwilight period, and the focus of the analysis is on these stops. The intertwilight period is shifted to later in the day in spring, due to differences between spring and fall in the scheduling of DST changes.

Figure 3.1 shows two time windows. Within these intervals, we computed the percentage of stopped drivers who were black. At 6:45 p.m., for example, 40 percent of the drivers stopped in darkness were black and 45 percent of the drivers stopped in daylight were black. These statistics imply that officers stop more black drivers when race is more visible. Note that both samples of stopped drivers occurred at 6:45 p.m., so the only likely difference between the daylight and darkness groups of drivers is visibility of race. While the statistics at 6:45 p.m. imply a racial bias, there are too few stops to be conclusive. In addition, calculations at other time points, such as 7:45 p.m., suggest no racial bias against black drivers, though these computations also involve too few stops. Statistically, we average over all time points using logistic regression to estimate the race effect.[2] Averaging over all time points combines all of the

[2] The logistic-regression model predicts an indicator for black driver from an indicator for darkness and a natural spline for clock time interacted with season.

Figure 3.1
Stops of Black and Nonblack Drivers, by Darkness and Clock Time (Fall and Spring 2006)



NOTE: Percentages within the bands indicate the percentage of stopped drivers in that time period who were black.

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observations while still adjusting for clock time. In addition, we adjust for day of the week, so that we contrast stops made in daylight and darkness on the same day of the week.

Recall that methods must be able to tease out effects of racially biased practices from racial differences in exposure to police and racial differences in driving offenses. Drivers at 6:30 p.m. are exposed to the same distribution of police on either side of the DST switch. While incidents will, from time to time, draw police to particular locations, according to CPD, the allocation of police effort does not suddenly change following the time change. As a result, this method is not as prone to errors due to differential police exposure. The drivers who are likely to offend during daylight are also likely to be the ones who offend at nighttime. At night, the overall rate of offending might decrease (e.g., speeding in poorly lit areas might decrease). However, we assume that there is not a differential change in relative offending rates by race as daylight moves into nighttime. Headlight violations are a special case, in that they could be associated with nonwhite drivers to the extent that there are racial differences in income and equipment on a car. Cars are less likely to have current registration and more likely to have nonfunctional equipment that is noticed only at nighttime. We removed all equipment violations from the analysis so that the method is not prone to errors due to differential offending rates. As a result, the method does not label as racial bias those differences that are due to differential exposure or due to differential offending rates. Table 3.4 shows the data used for the veil-of-darkness analysis. Clearly, this analysis excludes a large percentage of the recorded stops. However, it focuses on those stops that have the greatest potential to isolate the effect of racial bias. Other analyses in this report do make use of all of the available data.

Table 3.4
Stops Used in the Veil-of-Darkness Analysis

Characteristics	Stops
Stops in data set	55,336
Motor-vehicle stop	51,974
Moving violations only	37,088
Evening stops (intertwilight period)	4,644
Evening spring stops (±30 days of DST)	299
Evening fall stops (±30 days of DST)	307

Results

Overall, we did not find evidence of a racial bias in the decision to stop. The analysis included evening stops that occurred within 30 days of either the spring or fall DST change. We isolated this group of stops believing that the racial mix of drivers on the road is more similar during this limited period than during the rest of the year. There were relatively few reported stops in the morning hours, so we focused exclusively on evening stops. The estimates adjust for clock time, as shown in Figure 3.1, to control for the possibility that the racial mix of drivers exposed to the police may change at different clock times. Table 3.5 shows the results.

The odds ratio indicates how many times more likely daylight stops are to involve a black driver than are nighttime stops. As opposed to the past three years of analysis, in 2006, there is a substantial drop in the odds ratio, indicating that black drivers are significantly less likely to be stopped in daylight hours. This runs counter to the racial-profiling hypothesis and suggests a marked change from previous years. A key assumption to this analysis is that, on either side of changes to and from DST, there are no shifts in enforcement practices. In 2006, the Over-the-Rhine task force was implemented in April, immediately at the start of DST, and Operation Vortex began in October, shortly after the end of DST. Removing stops made by Vortex officers did not change the results, but other changes in the allocation of police may have occurred simultaneously. Changes that increase the number of black drivers stopped after dark, such as increasing the number of officers in predominantly black neighborhoods after the end of DST, could explain some of this change. We can account for some of these concerns by adjusting for the neighborhood in which the stop occurred; doing so increases the odds ratio slightly to 0.74 (p-value increases to 0.13). Neighborhood alone cannot explain the change in 2006, and other factors are likely at work.

Combining across all four years indicates that the accumulated data shows no evidence of a racial bias in the decision to stop.

The analysis summarized in Table 3.5 focuses on those stops in a tight period around the DST changes. That narrow focus aims to mitigate the risk that any observed differences might be due to seasonal differences of drivers on the road rather than racial bias (e.g., the mix of black and white drivers on the road in July may differ from the racial mix in December). Although we believe that the analysis is less prone to such errors, the price of that prudence is that we could use only 2,377 stops across four years. Large racial biases would be easily detected if they were present, but, if racial bias is not so pronounced, the analysis might not be sufficiently powerful to detect it.

Table 3.5
Comparison of Black and Nonblack Drivers Between Daylight and Dark, Seasonally Focused

Year	Odds Ratio	95% CI	p-value	n
2003	1.02	(0.70, 1.47)	0.93	543
2004	1.19	(0.80, 1.77)	0.37	465
2005	1.10	(0.81, 1.51)	0.53	763
2006	0.71	(0.51, 1.00)	0.05	606
Combined	0.98	(0.82, 1.16)	0.78	2,377

NOTE: Includes all stops occurring within 30 days of the spring or fall DST change during the evening intertwilight period.

We repeated the veil-of-darkness analysis using all stops occurring during the intertwilight period, regardless of when during the year they occurred. The result is a test that has less uncertainty but is more sensitive to possible seasonal changes in the mix of black and white drivers exposed to police. Table 3.6 shows the results, which indicate no evidence of racial profiling. As with the analysis of stops near DST, the 2006 odds ratio is less than 1.0, evidence contrary to the existence of a racial bias against black drivers. The odds ratios in the second column are near 1.0 for all years, indicating that drivers have an equal chance of being stopped regardless of whether their races were visible in advance of the stop. Combining the analysis across all four years reinforces the conclusion of no racial bias in the decision to stop.

Assessing Racial Disparities in the Decision to Stop, Using Internal Benchmarking

The daylight-darkness analysis tests whether racial bias is a departmentwide pattern of practice. If problems are not departmentwide, but rather the result of a few problem officers, the effect of their biases will likely not be large enough for the analysis in the previous section to detect the problem. In this section, we use an internal benchmarking approach. For each officer, we compare the racial distribution of drivers whom the officer stopped with the racial

Table 3.6
Comparison of Black and Nonblack Drivers Between Daylight and Dark, Year-Round

Year	Odds Ratio	95% CI	p-value	n
2003	1.04	(0.90, 1.20)	0.55	3,899
2004	0.99	(0.87, 1.14)	0.94	4,346
2005[a]	1.06	(0.94, 1.20)	0.34	5,193
2006	0.90	(0.79, 1.02)	0.10	4,644
Combined	0.99	(0.93, 1.06)	0.75	18,082

NOTE: Includes all stops during the evening intertwilight period.

[a] The 2005 figures reported here differ slightly from those reported in the original analysis of the 2005 data, which double counted observations. This did not affect the odds-ratio estimate, only the estimates of precision.

distribution of drivers whom other officers have stopped in the same neighborhoods and at similar times. See Fridell (2004, Chapter Eight) for an overview of internal benchmarking and its use in other jurisdictions.

Methods

The fundamental goal of internal benchmarking here is to compare a particular officer's rate of nonwhite stops with the rate of nonwhite stops of other officers patrolling the same area at the same time. Matching in this way assures us that the target officer and the comparison officers are exposed to the same set of offenses and offenders. Table 3.7 presents an internal benchmark constructed for a particular CPD officer based on the officer's 2005 stops (the neighborhood codes have been scrambled to de-identify the officer). Most of those stops occurred in neighborhood J (49 percent) and neighborhood K (33 percent) with some stops elsewhere in the city. Seventy-one percent of these stops involved black drivers. Depending on the distribution of the race of drivers committing stoppable offenses whom this officer could have stopped, the 71 percent figure could be too high. If vehicle stops that other officers made in the same areas and times at which this officer's stops occurred involved considerably less than 71 percent black drivers, further investigation of this officer is in order.

We located 571 stops that collectively have the same distribution of stop features as the stops made by the officer in question. They were made in the same places, at the same times, on the same days, during the same months, and for the same reasons. Since the officer made few stops in June and few in neighborhood H, the matched stops also showed very few stops in June and neighborhood H. Importantly, we created the matches without looking at the races of the drivers involved in the stops, mitigating the risk of setting up a comparison group of stops that would either absolve or fault the officer unfairly.

Of the matched stops, 46 percent involved a black driver. The officer in question appears to have stopped a larger fraction of black drivers (71 percent) than did other officers making stops in the same area. Statistically, this difference is larger than could be expected by chance. However, in a large collection of comparisons, some extreme differences can occur by chance.

The z-statistic is the commonly used statistical measure for assessing the magnitude of the difference between the percentage of an officer's stops involving a black driver and the officer's internal benchmark (Fridell, 2004). The z-statistic scales this difference to account for the number of stops that the officer made and the number of stops used to construct the internal benchmark, so that large differences based on a small number of stops are treated with greater uncertainty than large differences based on a large number of stops. Given the value of an officer's z-statistic, we can estimate the probability that a flagged officer is, in fact, an outlier. We flag all officers with an outlier probability exceeding 50 percent (equivalent in this analysis to a z-statistic cutoff of about 4.0). The choice of 50 percent as the cutoff is subjective and depends on the costs associated with failing to flag a problem officer and those costs associated with investigating each flagged officer. The commonly selected cutoff is 80 percent (Efron, 2004), but we believe that such a choice undervalues the cost of failing to identify a problem officer. In addition, the 50 percent probability cutoff produces a short list of officers for closer evaluation. Appendix B contains technical details about the methodology.

For the analysis, we selected all CPD officers with more than 50 reported stops in 2006; 294 officers exceeded that cutoff. The 50-stop cutoff focuses the analysis on those officers most frequently interacting with drivers in Cincinnati. It also ensures having at least a minimum level of statistical power for detecting differences if they exist. We have refined the

Table 3.7
Example of Internal Benchmarking for an Example Officer

Variable		Stops Made by Officer 534 (%)	Similar Stops Made by Others (%)	Effect Size[a]
n		111	571[b]	
Time	(12–4 p.m.]	9	9	0.01
	(4–8 p.m.]	57	56	0.01
	(8 p.m.–12 a.m.]	34	35	–0.02
Day	Monday	20	20	0.00
	Tuesday	12	11	0.02
	Wednesday	12	12	–0.00
	Thursday	20	21	–0.03
	Friday	14	14	–0.01
	Saturday	11	11	–0.01
	Sunday	13	12	0.03
Month	January	12	12	0.01
	February	14	15	–0.02
	March	7	7	–0.01
	April	6	6	0.00
	May	8	7	0.05
	June	3	3	–0.03
	July	4	4	–0.02
	August	10	10	0.00
	September	6	6	0.03
	October	4	5	–0.03
	November	14	14	0.01
	December	11	11	–0.01
Neighborhood[c]	H	1	1	–0.01
	I	1	1	–0.01
	J	49	48	0.02
	K	33	34	–0.02
	L	5	5	0.01
	M	11	11	–0.01
Stop reason	Equipment	64	63	0.01
	Moving	26	27	–0.01
	Other	10	10	–0.00

Table 3.7—Continued

Variable		Stops Made by Officer 534 (%)	Similar Stops Made by Others (%)	Effect Size[a]
Outcome	Stops involving black drivers	71	46	

[a] The effect size is the difference of the two columns divided by the standard deviation of the first column. Generally, 0.2 is considered a small effect size, a value much larger than any effect size computed for this comparison.

[b] For the comparison stops, n represents the effective sample size.

[c] The neighborhoods have been given random letter codes to mask the officer.

methodology from last year's report, which used a 100-stop cutoff, to include more officers in the analysis. These 294 officers amount to 37 percent of the CPD officers who reported a stop in 2006 and account for 85 percent of the 2006 stops.

In our previous reports, we used one of Cincinnati's 53 neighborhoods to indicate the location of the stop. Since we now have data on the policing block in which the stop occurred, we attempted to use that to provide a more refined indicator of stop location. We found that it was too difficult to find suitable matches at the level of the policing block. For a solution that balances our needs for a good selection of comparison stops and a refined indicator of location, we continued to match on neighborhood and matched on those policing blocks in which at least 10 percent of the officer's stops occurred. In this way, officers who have focused patrols in small areas are compared with those making other stops in those small areas, while officers ranging more broadly in Cincinnati are compared with similar stops at the neighborhood level. Stops on highways were considered to be in separate neighborhoods and not within any policing block.

Results

Stops were matched on month, day, time, neighborhood (53 neighborhoods plus eight highways), policing blocks in which at least 10 percent of the officer's stops occurred, and the reason for the stop.

Table 3.8 summarizes the results of the analysis, listing five officers with a greater-than-50 percent probability of having disproportionate stop patterns. The second column in Table 3.8 indicates the percentage of the officers' stops that involved a black driver. The third column shows the percentage of stops involving black drivers for the officers' benchmark. In these five cases, there are large differences between these percentages.

The last column shows the estimated probability that the officers' stop patterns do, in fact, depart from other similarly situated stops. Three officers were flagged as having a large probability of stopping a disproportionate percentage of black drivers (flagged officers 1, 2, and 3). Flagged officer 2 is part of the CPD's Vortex unit, the only one of a total of 26 Vortex officers flagged in this analysis (other Vortex officers did not complete more than 50 contact cards). This officer, in particular, made substantially more stops of black drivers than did the other officers patrolling at the same time and place, 93 percent versus 67 percent. Our analysis cannot distinguish whether this disparity is attributable to the particular officer or to the strategies that the Vortex unit has adopted. We will analyze Vortex stops as a collection later in this chapter. Two officers were flagged as having a large probability of stopping disproportionately few black drivers (flagged officers 4 and 5).

Table 3.8
Summary of Internal-Benchmark Analysis

	Stops involving a black driver (%)		Stops		
Flagged Officer	Officer	Internal Benchmark	Officer	Internal Benchmark	Outlier Probability
1	87	68	260	215	0.77
2	93	65	103	150	0.70
3	85	66	131	598	0.53
4	23	37	626	261	0.95
5	19	54	101	101	0.58

We estimate that five officers differ sufficiently from the internal benchmark to warrant further investigation. At this stage, we do not know whether there is a problem with these officers or why we observe such large differences. These differences cannot be due to differences in the stops' times, places, or reasons, though some of these features are measured coarsely. These officers may have assignments that are targeted to very particular locations so that matching on neighborhood and policing block alone is insufficient.

Discussion

The internal benchmark compared each officer's stops to stops made by other officers at the same time and place and for the same reason. Officers patrolling the same areas at the same times will be exposed to the same offender population. If the officers all had the same duties, we would expect the racial distribution of their stops to be similar, if not the same. We compared the racial distributions of these stops. We noted three officers who appeared to be stopping a much larger fraction of black drivers when compared with similar stops made by other officers.

All RAND studies go before an institutional review board that reviews research involving human subjects, as required by federal regulations. RAND's Federalwide Assurance for the Protection of Human Subjects (DHHS, through 2008) serves as its assurance of compliance with the regulations of 16 federal departments and agencies. According to this assurance, the committee is responsible for review, regardless of funding source. These federal regulations prevent RAND's research from singling out specific individuals whom its research could adversely affect.

The analysis in this section offers an estimate of the number of CPD patrol officers of concern. In the first quarter of 2007, RAND transferred capabilities to CPD analysts so that they could regularly run these analyses and conduct reviews of these officers. The system connects directly to CPD's contact-card database, constructs internal benchmarks for each officer, and produces a series of online reports navigable with a web browser. These reports highlight flagged officers and include details on the stops included in the internal benchmark. These reports are now being included in the flagged officers' quarterly reviews.

Assessing Racial Disparities in Post-Stop Outcomes

This section focuses on post-stop outcomes, including the decision to cite and search and stop duration. We used a method known as *propensity-score weighting* to identify stops involving nonblack drivers that are similarly situated to the stops involving black drivers and make post-stop comparisons between the two groups. Ridgeway (2006) gave a complete technical description of the method.

Methods

Officers conduct searches of 6 percent of stops involving black drivers. For stops of white drivers, the search rate is 3 percent. These figures describe the differences in experiences of black and white drivers in Cincinnati. Regardless of whether a racial bias causes these differences, such differences can fuel the perception of racial bias. These differences might have arisen from racial bias, or several other possible explanations could apply. The methods described here aim to measure how much of the observed racial differences in search rates (and several other stop outcomes) can be explained by other factors, to isolate the effect of racial bias.

Traffic stops involving black drivers occur at different times and places from those involving nonblack drivers. For example, nearly 8 percent of stops involving black drivers occur in the Over-the-Rhine neighborhood, while 4 percent of stops of nonblack drivers occur there. At the same time, 24 percent of stops of nonblack drivers were made on the highways, while only 9 percent of stops of black drivers were made on the highways. In addition, the driver's sex and age, the number of passengers, where they live, and whether they have a license all differ by race. In addition, these factors may, independently of race, influence an officer's post-stop decision process. For example, an officer may feel more (or less) compelled to issue a citation to a driver from Kentucky than to a Cincinnati resident. Since 11 percent of white drivers have Kentucky license plates compared with only 3 percent of black drivers, apparent racial disparities in citation rates may be due to differences in place of residence or other factors that are correlated with race.

Whether these possible scenarios do, in fact, occur in the post-stop decision process, to ensure a fair comparison, we must match similarly situated black and nonblack drivers and compare their stop outcomes.

Table 3.9 gives detailed information on stop features by driver race. The Black Drivers column shows the distribution of stop features involving black drivers. The Nonblack Drivers column shows the same distribution for *all* stops involving nonblack drivers. Comparisons between these two columns show large differences. The shaded rows mark a few of the particularly large differences. On the other hand, the Matched Nonblack Drivers column is nearly identical to the Black Drivers column. To arrive at this near match on the distribution of stop features required effectively paring the set of stops of nonblack drivers down from nearly 27,000 down to 6,600. This process downweighted and, at times, removed stops of nonblack drivers that had features that were atypical of stops involving black drivers. The key point of Table 3.9 is that any differences between black drivers and the matched nonblack drivers that we observe in post-stop outcomes *cannot* be due to any of the factors listed in Table 3.9. To isolate the effect of a racial bias, we must adjust for all factors associated with both race and post-stop outcomes, and we have made a concerted effort to include all such observable features in this analysis.

Table 3.9
Comparison of the Features of Stops Involving Black Drivers with the Features of Stops Involving Nonblack Drivers, Matched and Unmatched

Variable		Black Drivers (%) (n = 20,146)	Matched Nonblack Drivers (%) (n = 5,365)	Nonblack Drivers (%) (n = 24,383)
Neighborhood	CBD and Riverfront	2.4	2.4	4.8
	Queensgate	0.7	0.7	1.5
	West End	3.9	3.7	1.7
	Over-the-Rhine	7.1	6.9	3.2
	Mount Adams	0.3	0.3	0.9
	Pendleton	0.4	0.4	0.3
	East End	0.8	0.7	2.3
	East Walnut Hills	0.6	0.5	1.0
	Evanston	3.7	3.5	1.2
	Hyde Park	0.4	0.4	2.0
	California	0.0	0.0	0.0
	Oakley	0.6	0.6	1.6
	O'Bryonville	0.2	0.2	0.4
	Pleasant Ridge	0.4	0.5	0.2
	Kennedy Heights	0.3	0.2	0.1
	Mount Lookout	0.1	0.1	0.8
	Columbia and Tusculum	0.3	0.3	2.2
	Linwood	0.1	0.1	1.4
	Madisonville	1.4	1.4	1.1
	Mount Washington	0.1	0.1	0.6
	Sayler Park	0.0	0.0	0.6
	Riverside	0.2	0.2	1.5
	Sedamsville	0.2	0.2	1.4
	North Fairmount	0.8	0.9	0.1
	English Woods	0.6	0.6	0.2
	East Westwood	1.9	2.0	0.3
	Millvale	1.8	1.6	0.5
	Fay Apartments	1.0	1.0	0.1
	South Cumminsville	1.0	0.9	0.3
	East Price Hill	3.3	3.5	3.2
	West Price Hill	1.9	2.0	4.0

Table 3.9—Continued

Variable		Black Drivers (%) (n = 20,146)	Matched Nonblack Drivers (%) (n = 5,365)	Nonblack Drivers (%) (n = 24,383)
	Westwood	4.2	4.4	5.0
	Lower Price Hill	1.0	1.0	3.0
	South Fairmount	4.6	4.9	3.0
	Mount Auburn	1.7	1.7	1.0
	Corryville	1.9	2.0	1.3
	Avondale	5.0	4.7	0.9
	North Avondale	2.3	2.3	0.3
	Paddock Hills	0.9	0.7	0.2
	Hartwell	0.7	0.7	0.8
	Carthage	0.6	0.6	0.6
	Roselawn	1.6	1.4	0.6
	Bond Hill	3.0	3.4	0.5
	Walnut Hills	4.2	4.2	2.2
	College Hill	3.2	3.2	1.0
	Clifton and University Heights	2.2	2.2	2.8
	Fairview	2.0	2.2	2.1
	Northside	4.7	4.8	2.6
	Clifton	3.2	3.3	4.8
	Mount Airy	2.5	2.4	1.3
	Winton Hills	1.1	1.2	0.1
	Winton Place	1.9	1.7	0.8
	Camp Washington	2.3	2.2	1.5
	I-275	0.0	0.0	1.0
	I-471	0.0	0.0	0.2
	I-71	2.1	2.1	6.1
	I-74	0.5	0.5	2.7
	I-75	6.0	6.1	13.6
	SR-126	0.0	0.0	0.0
	SR-562	0.2	0.2	0.3

Table 3.9—Continued

Variable		Black Drivers (%) (n = 20,146)	Matched Nonblack Drivers (%) (n = 5,365)	Nonblack Drivers (%) (n = 24,383)
Residence	Cincinnati	91.8	90.8	63.2
	Ohio (not Cincinnati)	3.8	4.3	18.8
	Kentucky	1.9	2.6	11.7
	Outside Ohio and Kentucky	2.5	2.4	6.3
Invalid driver's license		18.0	13.2	5.3
Time	12–3 a.m.	23.3	21.8	16.7
	3–6 a.m.	5.2	4.8	3.7
	6–9 a.m.	6.0	8.3	10.8
	9 a.m.–12 p.m.	6.8	7.8	12.7
	12–3 p.m.	6.9	7.5	12.8
	3–6 p.m.	16.9	17.8	15.2
	6–9 p.m.	15.8	14.9	12.7
	9 p.m.–12 a.m.	19.0	17.0	15.4
Reason	Equipment violation	24.0	22.6	12.7
	Moving violation	66.1	69.7	83.4
	Offense	1.8	1.0	0.6
	Other	3.3	3.0	1.4
	Stolen auto	0.2	0.1	0.0
	Suspect in vehicle	4.6	3.6	1.8
Occupants	1	62.4	65.9	74.2
	2	24.6	23.3	17.7
	3	8.3	7.2	5.1
	4	3.4	2.5	2.2
	4+	1.3	1.1	0.8
Registration	Ohio	94.9	93.5	83.4
	Kentucky	2.7	3.5	10.6
	Other	2.5	3.1	6.0
Age (years)	0–17	1.7	1.7	1.8
	18–25	34.8	32.4	31.2
	26–35	28.9	26.3	26.0
	36–45	17.5	19.0	18.9
	46+	17.1	20.6	22.0

Table 3.9—Continued

Variable		Black Drivers (%) (n = 20,146)	Matched Nonblack Drivers (%) (n = 5,365)	Nonblack Drivers (%) (n = 24,383)
Day	Monday	13.4	13.2	13.4
	Tuesday	14.6	15.2	15.4
	Wednesday	15.6	16.6	16.5
	Thursday	15.0	15.1	15.0
	Friday	14.6	15.4	15.2
	Saturday	14.8	13.9	14.2
	Sunday	11.9	10.7	10.3
Month	January	8.6	9.6	9.1
	February	8.7	8.8	9.5
	March	8.9	9.0	9.2
	April	7.9	7.4	9.1
	May	7.6	8.3	7.9
	June	8.1	7.8	8.0
	July	8.7	8.2	8.3
	August	8.8	8.1	8.4
	September	8.6	7.8	8.2
	October	9.2	9.6	8.5
	November	7.2	7.9	6.8
	December	7.7	7.4	7.2
Male		65.9	64.6	65.1

NOTE: Stops were matched also by policing blocks within each neighborhood.

While we attempted to account for as many stop features that might be associated with both race and stop outcomes, it is plausible that other variables not listed in Table 3.9 might be important. For example, the contact cards give no information on how serious the moving violations were. If one racial group committed more serious or more dangerous moving violations, our matching cannot account for this. Differences in stop outcomes between black and matched nonblack drivers may be due to racial bias or any unobserved factor not listed in Table 3.9, such as seriousness of offense.

Results

The process of matching stops involving nonblack drivers to stops involving black drivers can determine the factors that most distinguish their stops. Table 3.10 lists the relative influence of each of the factors, essentially how much each of the factors contributed to eliminating the differences between the two groups. Most of the difference between the features of stops of black and nonblack drivers involves differences in stop locations. Driver residence was also an important factor on which the black and nonblack driver stops greatly differed.

Stop Duration. The stop-duration analyses adjusted for all the factors listed in Table 3.10 as well as for whether the officer issued a citation and whether a search occurred. Any differences in stop duration, therefore, cannot be attributed to citations, searches, or any of the factors listed in Table 3.10. Several racial groups composed the nonblack comparison group. The comparison group was predominantly white (93 percent) but also includes Latino (2 percent) and other (5 percent) racial groups.

Table 3.11 shows the stop durations for black and nonblack drivers. As we found in 2005, there is no racial difference in the percentage of stops that last less than 10 minutes when we account for the factors in Table 3.10. Even though the average duration of stops of black drivers are longer than the citywide average duration of stops of nonblack drivers, for black and similarly situated nonblack drivers, 47 percent of the time stops last less than 10 minutes. Black drivers were actually significantly less likely to have stops exceeding 30 minutes, compared to similarly situated nonblack drivers.

Note that 56 percent of the unmatched stops of nonblack drivers lasted less than 10 minutes, but much of the difference between 56 and 47 percent is due to differences in stop location, the driver's residency, the validity of driver's license, and other factors (e.g., highway traffic stops may take less time than other traffic stops). As a result, the places, times, and conditions under which officers stopped black drivers tended to yield longer stops. Nonblack drivers stopped under those same conditions had essentially the same stop durations, indicating that individual officers' biases were not likely to cause longer stops. However, as we reported in 2005, the long stops result in Cincinnati's black residents having extended negative interactions with the CPD and may contribute to greater police-community friction within the black communities.

Table 3.10
Relative Influence of Variables

Variable	Relative Influence (%)
Policing block	92.8
Driver residence (Cincinnati, other Ohio, or not Ohio)	5.1
Invalid driver's license	0.7
Time of stop	0.4
Reason for stop	0.3
Number of vehicle occupants	0.2
License-plate state	0.1
Age of driver	0.1
Neighborhood	0.0
Day of the week	0.0
Month stop occurred	0.0
Driver sex	0.0
Total	100.0

Table 3.11
Stop Durations for Black and Nonblack Drivers

Year	Stop Duration (Minutes)	Black Drivers (%)	Nonblack Drivers (Matched) (%)	Nonblack Drivers (Unmatched) (%)
2003[a]		n = 16,708	n = 4,881	n = 18,548
	(0,10)	40	43	56
	(10,20)	42	41	36
	(20,30)	10	9	5
	(30,360)	8	7	4
2004[a]		n = 18,721	n = 5,190	n = 20,390
	(0,10)	40	44	59
	(10,20)	43	39	33
	(20,30)	10	10	5
	(30,360)	8	7	3
2005[b,c]		n = 15,571	n = 4,965	n = 20,431
	(0,10)	45	47	60
	(10,20)	43	42	34
	(20,30)	7	7	4
	(30,360)	4	4	2
2006[d]		n = 15,557	n = 3,358	n = 18,458
	(0,10)	47	47	56
	(10,20)	42	40	35
	(20,30)	8	8	6
	(30,360)	4	5	2

[a] In 2003 and 2004, there was a significant difference in the distribution of stop durations between black and nonblack drivers.

[b] This analysis excludes stops with missing stop durations, which comprised about 20 percent of the 2005 stops and 24 percent of the 2006 stops.

[c] In 2005, there was no significant difference in the distribution of stop durations between black and similarly situated nonblack drivers.

[d] In 2006, black were significantly less likely to have stops exceeding 30 minutes than were similarly situated nonblack drivers.

Citation Rates. Table 3.12 compares citation rates for black drivers with those for a matched set of nonblack drivers. Stops resulting in arrest were excluded from this analysis. Citation rates have generally been decreasing over the past several years. In 2003 and 2004, we found no difference in citation rates between the two groups. Both in 2005 and 2006, we find a 3 percent gap between the citation rates for black and matched nonblack drivers. Statistically, this is a significant difference. A 3 percent gap may not be negligible. We do not expect all stops to result in citations and expect some number of investigatory stops. However, one interpretation of the 3 percent gap is that police stopped an excess of 600 black drivers

Table 3.12
Citation Rates of Black Drivers and of a Matched Set of Nonblack Drivers

Year	Black Drivers	Nonblack Drivers (Matched)	Nonblack Drivers (Unmatched)	p-value
2003	n = 12,064	n = 4,438	n = 16,318	0.98
	74.6%	74.6%	82.7%	
2004	n = 12,507	n = 4,386	n = 16,920	0.14
	69.2%	70.4%	79.9%	
2005	n = 19,375	n = 6,141	n = 25,163	< 0.001
	67.7%	70.8%	78.1%	
2006	n = 20,146	n = 5,365	n = 24,383	< 0.001
	62.7%	66.5%	73.3%	

NOTE: The shaded cells indicate the most relevant comparisons.

(3 percent of 20,000 stops). An alternate explanation is that the black drivers who would have received citations were actually found to have criminal involvement and were arrested rather than cited. We had removed stops resulting in arrest from the analysis to focus the analysis on the simplest stops.

Search. The decision to search involves many factors and different levels of officer discretion. If a search occurred, the contact card included the legal basis for the search. We coded the following legal bases as high discretion: consent, reasonable suspicion of weapons, dog alert, odor (alcohol or drugs), and other probable cause. We coded the following legal bases as low discretion: plain view, inventory, and incident to arrest.

Table 3.13 shows a comparison of the adjusted and unadjusted search rates broken down by level of discretion. The shaded cells indicate the most relevant comparison. For high-discretion searches, the searches most at risk for a racial bias, black and matched nonblack drivers have nearly the same search rates. As opposed to earlier years, in 2006, we found that officers searched black and similarly situated nonblack drivers at the same rate. An officer was actually less likely to use a high-discretion search on a black driver than on similarly situated nonblack drivers. While the search rate of black motorists is twice the search rate of all nonblack motorists, the search rates are nearly the same when other important factors are taken into account (e.g., time and location of stop, whether the motorist has a valid driver's license).

Note that the unmatched analysis shows that there are large differences in the experiences that black and nonblack drivers have; officers search black drivers at a rate that is more than double the rate for nonblack drivers (11.0 percent versus 4.8 percent). These differences in experiences can differentially shape black residents' view of CPD officers. Our analysis indicates that other factors besides racial bias can explain much of these differences; black drivers are stopped in locations, times, and situations for which officers are much more likely to search. White drivers stopped in those situations are equally likely to be searched, so racial bias cannot be the reason for the observed difference in search rates. Nonetheless, this will be of little solace to the many searched black drivers, even if all of the searches were legitimate and conducted professionally.

Table 3.13
Searches of Black Drivers and of a Matched Set of Nonblack Drivers

Year	Discretion	Black Drivers	Nonblack Drivers (Matched) (%)	Nonblack Drivers (Unmatched) (%)	p-value
2003		n = 16,708	n = 4,992	n = 18,548	
	High	5.9	5.4	2.8	0.00
	Low	8.1	5.5	2.7	0.00
	All	14.0	10.9	5.5	0.00
2004		n = 18,721	n = 5,342	n = 20,390	
	High	6.7	6.2	3.2	0.00
	Low	10.7	7.0	3.9	0.00
	All	17.4	13.2	7.1	0.00
2005		n = 19,375	n = 6,141	n = 25,163	
	High	6.1	5.2	2.8	0.00
	Low	4.4	3.5	1.6	0.00
	All	11.4	9.4	4.7	0.00
2006		n = 20,146	n = 5,365	n = 24,383	
	High	6.1	6.7	3.0	0.06
	Low	4.9	3.9	1.8	0.04
	All	11.0	10.7	4.8	0.82

NOTE: The shaded cells indicate the most relevant comparison, comparing black drivers to matched nonblack drivers on high-discretion searches.

Table 3.14 breaks down the searches in more detail. The high-discretion search–rate difference for 2006 noted in Table 3.13 appears to be due to a sizable difference in searches based on driver consent, shaded in Table 3.14. Black drivers were more likely to be involved in a low-discretion search, but this difference is attributable to a large difference in searches that were incident to arrest, as shown in Table 3.14. Our data are insufficient to determine whether there may have been a racial bias in the arrest decision, but, once an officer made an arrest, CPD policy requires a search of the arrested motorist. Therefore, since more stopped black motorists were arrested than stopped nonblack motorists, we expected this difference.

Again, we stress that comparisons with unmatched nonblack drivers exaggerate the search-rate disparity, conflating potential officer bias with circumstances surrounding the stop. When properly matched, we found that black and nonblack drivers stopped under the same conditions had nearly the same search rates.

In addition, as noted in our previous reports, police search practices put the greatest burden of search on stop conditions that were more common to black drivers. As a result, Cincinnati's black residents were more likely to be stopped under conditions (i.e., neighborhood or time) that elevated the chance of a search. Some characteristics, such as having a valid driver's license, are clearly in the driver's hands. Officers searched 44 percent of the drivers stopped without a license, regardless of race. However, stopped black drivers were more than three

Table 3.14
Detailed Comparison of Searches of Stopped Black Drivers with Those of a Matched Set of Nonblack Drivers

Year	Legal Basis (sorted roughly from high to low discretion)	Black Drivers	Nonblack Drivers (Matched) (%)	Nonblack Drivers (Unmatched) (%)	p-value
2003		n = 16,708	n = 4,992	n = 18,548	
	Consent	4.3	3.9	2.1	0.35
	Reasonable suspicion of weapons	0.4	0.3	0.1	0.54
	Dog alert	0.0	0.0	0.0	0.76
	Odor (alcohol or drugs)	0.9	0.8	0.5	0.00
	Other probable cause	0.4	0.4	0.2	0.94
	Plain view	0.4	0.3	0.2	0.17
	Inventory	0.7	0.5	0.2	0.11
	Incident to arrest	7.0	4.8	2.4	0.00
2004		n = 18,721	n = 5,342	n = 20,390	
	Consent	4.5	4.5	2.3	0.83
	Reasonable suspicion of weapons	0.5	0.4	0.2	0.25
	Dog alert	0.2	0.0	0.0	0.12
	Odor (alcohol or drugs)	1.1	0.6	0.4	0.00
	Other probable cause	0.6	0.6	0.3	0.91
	Plain view	0.7	0.7	0.6	0.97
	Inventory	0.6	0.3	0.1	0.00
	Incident to arrest	9.4	6.0	3.3	0.00
2005		n = 19,375	n = 6,141	n = 25,163	
	Consent	3.8	3.9	2.0	0.70
	Reasonable suspicion of weapons	0.8	0.3	0.1	0.00
	Dog alert	0.0	0.0	0.0	0.01
	Odor (alcohol or drugs)	0.9	0.3	0.2	0.00
	Other probable cause	0.7	0.8	0.4	0.81
	Plain view	0.5	0.5	0.3	0.52
	Inventory	0.6	0.5	0.1	0.36
	Incident to arrest	2.9	2.3	0.9	0.00

Table 3.14—Continued

Year	Legal Basis (sorted roughly from high to low discretion)	Black Drivers	Nonblack Drivers (Matched) (%)	Nonblack Drivers (Unmatched) (%)	p-value
2006		n = 20,146	n = 5,365	n = 24,383	
	Consent	3.9	4.9	2.2	0.05
	Reasonable suspicion of weapons	0.7	0.5	0.2	0.12
	Dog alert	0.1	0.0	0.0	0.00
	Odor (alcohol or drugs)	0.6	0.4	0.2	0.32
	Other probable cause	0.7	0.8	0.4	0.30
	Plain view	0.3	0.2	0.1	0.20
	Inventory	0.5	0.6	0.1	0.82
	Incident to arrest	3.5	2.8	1.2	0.02

times more likely than were nonblack drivers to have an invalid driver's license (27 percent versus 8 percent), greatly increasing the prevalence of searches among black drivers.

Hit Rates

A search's success depends partially on whether contraband is found (Ayres, 2002). If police searched more drivers, their hit rates (the rate at which they recovered contraband) would likely decrease, because they would be searching drivers who are less suspicious. If the hit rate were lower for one racial group, this would suggest that officers searched that racial group more often than they did other racial groups. The number of reported searches continues to increase; 2006 shows a 16 percent increase in searches over 2005. This is mostly due to a 32 percent increase in low-discretion searches, such as searches incident to arrest, an increase that is equal across racial groups.

Table 3.15 separates hit rates by discretion level. For high-discretion searches, the hit rates for black drivers are nearly the same as the hit rates for nonblack drivers. For lower-discretion searches, the hit rates are similar for black and nonblack drivers with the exception of 2005, when the hit rate was higher for black drivers. The similarity of these rates implies that officers appear to be rather efficient at selecting individuals to search and that there does not seem to be a racial bias in their selection of which drivers to search.

Even though we found no racial bias, officers conducted 1,425 high-discretion searches of black drivers in 2006 that recovered no contraband. Such stops, which the motorist likely views as being made for no good reason, disproportionately affect the black community and likely contribute to blacks' perceptions of unfair policing that were identified in last year's report. While recovery of contraband, such as 94 weapon and 1,637 drug recoveries, can have a social benefit for the Cincinnati community, there is a societal cost for searches that result in no recovery of contraband.

Table 3.15
Hit Rates, by Year and Race

		Black Drivers		Nonblack Drivers		
Year	Discretion	Searches	Hit Rate (%)	Searches	Hit Rate (%)	p-value
2003	High	982	28.0	517	22.4	0.02
	Low	1,360	16.3	495	16.2	0.96
2004	High	1,250	28.8	649	26.7	0.35
	Low	1,984	19.4	798	20.8	0.43
2005	High	1,743	29.0	1,011	26.5	0.18
	Low	2,763	19.6	1,203	15.5	0.00
2006	High	1,858	23.3	1,023	23.6	0.91
	Low	3,654	21.5	1,582	21.0	0.75

NOTE: The number of searches may not equal the total in Table 3.15 due to officers not recording the legal basis for some of the searches.

Analysis of Vortex Officers

In April 2006, CPD began the Over-the-Rhine task force, which, in October, transformed into the citywide Operation Vortex, a crime-reduction strategy that created a team of officers available to saturate target areas with additional patrol officers. We use the term *Vortex* to describe both the Over-the-Rhine task force and the Vortex unit. Vortex has been a contentious issue in Cincinnati. Some have attributed reported reductions in crime in Cincinnati to the fielding of Vortex officers. The monitoring team has suggested that the strategy is inconsistent with problem-oriented policing and may create further tensions between police and the community (Green and Jerome, 2007). In this section, we analyze the stops of Vortex officers and describe how they differ from the stops of other officers patrolling the same neighborhoods at the same times.

We used propensity-score weighting to reweight stops involving a non-Vortex officer so that they have the same distribution of features as the Vortex officers' stops, matching on when the stop occurred (month, day of the week, and time of day) and where the stop occurred (one of the seven interstates or highways or one of the 496 policing blocks).

In the times and places in which Vortex officers made stops, their stops comprised one-third of the stops. Vortex stops involved black drivers 71 percent of the time, while non-Vortex officers patrolling at the same times and places involved black drivers in 65 percent of the stops. This is a statistically significant difference (p-value < 0.001). If the Vortex officers shared the same practices as the non-Vortex officers in these areas, there would have been an estimated 88 (95 percent CI [46, 131]) fewer stops involving black drivers. However, the 6 percent difference also indicates that Vortex is not exceedingly different, in terms of the stops of black drivers, from CPD's standard policing practices in these neighborhoods.

Vortex officers were significantly less likely to make stops for moving violations (54 percent versus 62 percent), with more stops for criminal offenses, equipment violations, and stolen cars. Such patterns are indicative of the Vortex strategy. However, it is not these practices that

appear to explain the higher percentage of stops of black drivers for Vortex officers. Even after matching the Vortex and non-Vortex stops on reason for the stop, the difference between the rate of stops of black drivers between Vortex and non-Vortex stops is unchanged from the results presented in Table 3.16.

Citations. We analyzed the stops of Vortex officers to assess differences in rates of citations between black and white drivers and in comparison to non-Vortex officers.

Table 3.17 shows that Vortex officers are slightly less likely than are non-Vortex officers to issue citations, although the difference is not statistically significant (p-value = 0.11). One possible reason for this could be that Vortex officers are making stops that are more likely to lead to arrests rather than to citations. For Vortex officers, we find no difference in the rate of citations across racial groups (p-value = 0.66).

Searches. We also compared search rates by race between Vortex and non-Vortex officers. As with the citation analysis, we used Vortex officers' stops of black drivers as a reference group so that all other groups are reweighted to have the same distribution of stop features as the Vortex officers' stops of black drivers have.

Table 3.18 shows the results. We found that Vortex officers are twice as likely to use a high-discretion search (e.g., consent search, reasonable suspicion of weapons) than are non-Vortex officers (p-value = 0.002) but that there was no difference in search rates across the racial groups (p-value = 0.50).

Table 3.19 describes the efficiency of these searches by comparing rates of contraband recovery following searches. For non-Vortex stops, the hit rates for black and white drivers are nearly equal, but hit rates for searches by Vortex officers of white drivers have significantly higher rates than those for black drivers (p-value = 0.006).

Overall, it appears that the Vortex strategy results in an increase in the percentage of stops involving black drivers, and an increased frequency of searches when compared to stops that non-Vortex officers made in the same places and at the same times. However, for the Vortex officers, the citation rates and search rates between black and white drivers were equal.

Table 3.16
Stops of Drivers of Different Racial Groups, by Vortex Assignment

Assignment	Black Drivers	White Drivers	Hispanic Drivers	Other Drivers
Vortex (n = 1,466)	71	27	1	1
Non-Vortex (n = 2,949)	65	33	1	2

NOTE: The n computed for the number of non-Vortex stops is the effective sample size accounting for the propensity-score weighting.

Table 3.17
Stops Resulting in Citations

Assignment	Black Drivers (%)	White Drivers (%)
Vortex	58	60
Non-Vortex	61	67

Table 3.18
Stops Resulting in Searches

Discretion	Officer	Black Drivers (%)	White Drivers (%)
High	Vortex	22	25
	Non-Vortex	13	14
Low	Vortex	21	19
	Non-Vortex	24	17

NOTE: Search rates in this table differ from those in Table 3.13 because Vortex officers generally operate in higher-crime areas in which searches are more frequent.

Table 3.19
Searches Resulting in the Recovery of Contraband

Officer	Discretion	Black Drivers (%)	White Drivers (%)
Vortex	High	23.1	33.1
	Low	35.0	52.9
Non-Vortex	High	23.3	22.9
	Low	20.6	20.5

CHAPTER FOUR

Analysis of Videotaped Police-Motorist Interactions

Overview

To better understand interactions between CPD and members of the community, we analyzed 318 randomly sampled video records of traffic stops from 2006. An interracial group of independent, trained coders viewed these recordings and described the interactions using a wide range of measures. These included measures of the objective characteristics of the stop (e.g., duration, infraction type, time of day) as well as measures of the communication between the driver and the police officer.

This analysis differs in important ways from the analysis of CPD stop data in Chapter Three. Most notably, we do not match groups on situational characteristics (e.g., neighborhood), due to the smaller sample size. Because of this, the current analysis is not designed to determine whether racial inequalities are uniquely attributable to racial profiling. Instead, the analysis is designed to look for differences that community members are likely to perceive as evidence of racially biased policing, regardless of their cause. Thus, the analysis cannot assess the officers' reasons for their activities, but it does reflect how blacks and whites in the community experience those activities. This approach highlights the factors that are barriers to improved police-community relations, rather than searching for definitive evidence of civil-right violations or the identification of racists.

This analysis revealed three key differences associated with officers' and drivers' races: (a) black drivers were more likely to experience proactive policing during the stop, resulting in longer stops that were significantly more likely to involve searches; (b) white officers were more likely than were black officers to use proactive police tactics; and (c) white drivers' communication quality was more positive than was that of the black drivers—specifically, it was more apologetic and less argumentative.

These results are largely consistent with the findings in the year-one and year-two reports. However, there has been substantial improvement in the quality of the data, with the overall missing rate less than half of what it was in the year-one report. Another difference from last year's findings is the significant evidence of greater proactive policing by white officers relative to black officers. Proactive policing occurs when officers enforce relatively common or minor infractions (e.g., broken taillights, speeding, or loitering) as a way to search for drugs, weapons, or outstanding arrest warrants. However, the overall pattern of data is quite similar to last year, with the black driver–white officer combination having the highest rates of proactive policing behaviors, epitomized by such actions as requiring identification for passengers.

We believe that reducing these differences is important for improving the relationship between CPD and the community it serves. These improvements will likely require a closer

alignment between police practices and community priorities, the implementation of policies to ensure that white and black officers police black neighborhoods in a similar manner, and efforts by individual officers and citizens to minimize the inconvenience and irritation caused by traffic stops.

Background

Information from vehicle-mounted video and audio recordings can shed light on the origins of police-community conflict and dissatisfaction, because they can document the quality of an interaction. Traffic stops constitute one of the most common interactions between police and community members. Prior to the last two years' reports, there had been very little objective information about what typically occurs in traffic stops and how this may depend on the race of the officer or driver. In the absence of any valid data, beliefs about possible racial difference in these interactions are inevitably based on anecdotes, prejudices, or fears. By having trained, independent observers carefully analyze a random sample of traffic stops, this report is providing needed empirical evidence to assess possible problems in these interactions. This information may also point to specific policies and procedures that can improve police-community relations.

Data available in a video can address a much more diverse array of interaction characteristics than is available from the contact cards, including details of the communication and behavior of both the officers and the citizens involved. It also allows for third-party verification of the data that is provided by the officer on the contact card (e.g., stop duration and vehicle search), which may be more convincing to those community members with low trust in the police.

Recent research in communication, linguistics, and psychology has focused on the processes governing interactions between individuals. One conclusion of this research is that individual behavior can be understood only as part of a reciprocal, dynamic process between the participants. Personal expectations about an interaction are transmitted through verbal and nonverbal cues that each participant is constantly interpreting. These interpretations determine behavior, and these behaviors then affect the responses of the other party (Darley and Fazio, 1980; Giles and Smith, 1979). Interactions that result in conflict can often be traced to verbal and nonverbal cues that a participant interprets (or misinterprets) as distrust, disrespect, or anger (e.g., Mehrabian, 1968; Schlenker and Leary, 1982). Neither individual may be solely to blame for a conflict; instead, each person sees his or her own behavior as a reasonable and justified reaction to the situation. Nevertheless, changes in interpersonal interaction could have prevented the conflict.

Unfortunately, intergroup and interracial interactions, even among persons harboring no prejudice against the other group, often exhibit the sort of verbal and nonverbal cues that have led to conflict or hostile interactions (e.g., Devine and Vasquez, 1998; Hecht, Jackson, and Ribeau, 2003; Word, Zanna, and Cooper, 1974). In the absence of prejudice, interracial interactions may still go poorly because of low expectations of a pleasant interaction, misattribution of behavior to prejudice, or different cultural expectations for communication. For example, a nonwhite driver may appear irritated or defensive during a traffic stop because of a personal history of negative interactions in similar situations and not because of any disrespect to a particular officer. Similarly, a nonprejudiced white officer may actually behave differently in

interactions with blacks because of concern about being perceived as prejudiced, even though such behavioral changes may be seen as defensive, aggressive, or disrespectful (Devine, Evett, and Vasquez-Suson, 1996).

Our analysis of the audio and video records of traffic stops is designed to shed light on how these interactions between police and community members unfold. We have conducted a study that pinpoints how these interactions differ as a function of both officer and driver races. We have also identified aspects of the traffic stops that are associated with counterproductive or dissatisfying interactions. Finally, this report provides guidance on training and policies that may improve these interactions.

Methods

Sample of Interactions

The current study was designed to investigate the extent to which interactions between drivers and officers might be affected by the races of the officers and drivers involved. These analyses were conducted on a stratified random sample of video records (n = 318) received from CPD.

The sampling frame for this sample was defined by the contact-card data that police officers entered. Contact cards were used to define the universe of stops because other data sources (e.g., call logs) are not linked to racial data, so the driver's race would typically be unknown. The completion of these contact cards is mandatory under CPD policy, and our attempts to validate the completion rates indicate a substantial degree of compliance (above 90 percent; see Chapter Three). However, any systematic biases in the completion of contact cards could still influence the generalizability of our findings. Our sampling frame included all incidents that (a) had contact-card data associated with the incident, (b) involved a motor-vehicle stop, (c) had a driver's race that the officer assessed as either white or black, (d) had an officer's race that was reported as either white or black in CPD records, and (e) occurred during calendar year 2006. Incidents were included in the sampling frame without regard to the MVR data field on the contact card, which was designed to indicate whether a video recording was made. Thus, we requested to see recordings even when the officer did not explicitly state that a recording existed.

Four sampling strata were created based on the officer and driver races: black officer–black driver, black officer–white driver, white officer–black driver, white officer–white driver. Incidents were randomly sampled within each of these four strata using a computer-generated random number. Thus, all incidents within a stratum had an equal probability of being requested. To best achieve the goals of this task, an equal number of incidents was requested from each of the four strata. This provides the maximum analytic power (the ability to detect a difference that actually exists in the population) for describing racial differences in the interactions. By requesting an equal number of interactions from each stratum, we oversampled incidents involving nonwhite (black) officers and drivers. Thus, the aggregate sample is not a representative sample of all incidents involving the CPD, although it is a representative sample of incidents within each of the four racially defined strata. We believe that the stratified random-sampling method employed resulted in the strongest possible sample for the intended goals of the study, avoiding common problems associated with convenience samples or correlated observations that plague many studies of interpersonal communication.

For each month of 2006, CPD sent us a data file including the relevant contact-card data. RAND researchers sampled incidents from this monthly data and requested that CPD send any video records associated with those incidents. To account for the possibility of missing data (incidents not recorded, records not found, or damaged records), we requested more incidents than needed for the analysis. To ensure the desired sample of 300 analyzable incidents, we included 625 incidents in the requests. A total of 512 recordings were actually sent. To preserve the desired random sample, we analyzed only the first eight available recordings of each type in each month. Of the incidents requested, 18 percent were not sent to us (see Table 4.1) and were thus *not available* for analysis. This is a substantial improvement from the 40 percent *not available* rate in the year-two report and an even larger improvement from the 55 percent rate in the year-one report. There was also evidence of continued improvement within 2006; the missing rate for January through June was 20 percent, but it was 16 percent for July through December.

It is important to note that incidents were labeled *not available* in cases in which no video recording ever existed. For example, all requested motor-vehicle stops conducted by motorcycle or foot-patrol officer would be considered not available for analysis. Similarly, any stops conducted by patrol cars without video equipment installed or with malfunctioning equipment are not available. When CPD could identify the reason that a recording is not available, it noted this when replying to our requests. The use of a motorcycle or bike in the traffic stop explained approximately one-third of unavailable tapes. This was the largest single identifiable cause and suggests that the not-available rate for stops when the vehicle is equipped with a camera may be as low as 12 percent.

CPD labeled each recording with an incident number. When a recording contained more than one incident, RAND staff located the requested incident on the tape or digital recording by matching the time stamp on the recording with the time reported on the contact card. When none of the incidents occurred within 45 minutes of the time listed on the contact card, other information from the contact card was clearly incorrect, or the recording could not be played for technical reasons, we determined that a match was not found, and that incident was coded as missing. This is a stricter standard than from years one and two, in which the incident had to be off by more than one hour. Thirteen percent of the available recordings did not have

Table 4.1
Data Quality of the Video Records

Aspect of Data Quality	%
Of incidents requested, percentage of records not available	18
Of recordings sent, percentage of time incident not found[a]	13
Overall percentage of requested incidents missing for analysis	29
Of the usable records (n = 318)	
Percentage in which incident is not completely recorded	3
Percentage in which the officer's voice is not audible	15
Percentage in which the driver's voice is not audible	24

[a] An incident was considered not found when the record labeled with the incident number did not contain an incident with an electronic time stamp within 45 minutes of the time marked on the contact card.

a satisfactory match to the contact-card data (or were damaged) and were considered *not found* (see Table 4.1). Using the definition of *not found* that was used in the year-two report, the rate would have been 11 percent. This is approximately same as the 11 percent not-found rate in the year-one report and the 10 percent rate from the year-two report. This yields a total missing rate of 29 percent for the current analyses. This represents a substantial improvement from the 45 percent missing in year two and 60 percent missing in year one.

Because we had more recordings this year than were needed to achieve a 300-incident sample size, we did not attempt to code recordings with extensive technical problems. This may make our data-quality variables appear slightly better than they were in past years, so these should not be compared over years. Consistent with our goal of coding at least 300 incidents, we coded 318 nonmissing incident recordings.

There are also several more minor types of missing information that affect only some of our measured variables on the 318 coded videos. In approximately one-quarter of the recordings, either the video or the audio was of poor quality (e.g., camera was not aimed so that driver and officer were in the field of view, or the audio quality would not allow coders to understand the driver). The number of cases in which the video record was not complete (omitting either the beginning or end of an incident) dropped to 3 percent.

As with data in prior years, the rates of missing records (*missingness*) for both the incidents not available and the incidents not found were approximately equal across the racially defined strata. Because the missingness is not associated with the primary predictor variables in our analyses, it is less likely to constitute a threat to the study's validity. Nevertheless, missing data may be of the "non-ignorable" type (Little and Rubin, 1987) if the causes of the missing data are different for the different racial groups. It is still desirable to further reduce missingness in the subsequent years of the study to further reduce this threat to validity.

The total usable sample size of 318 is very near our target of 300 coded incidents. This sample size was chosen because it provides a good balance between costs and statistical power to detect differences. It allows us an 83 percent chance of detecting a difference in means across two groups (using standard statistical assumptions) when the true difference is half of one standard deviation, a medium effect size (Cohen, 1988). Many of the effects found in previous years' studies were smaller than half of a standard deviation. For instance, when the difference between groups is one-quarter of a standard deviation, we have less than 40 percent power. In other words, when the differences in the population are relatively small, we will detect them less than half the time that we conduct a study of this size. For this reason, the reader should expect that many of the small or medium-sized effects we found as significant in past years' data will not be detected as significant in the 2006 data, a result that is entirely due to chance inherent in random sampling. The fact that an effect is not significant within every year's data should not be interpreted as a change in police or driver behavior across years but as an inherent limitation of working with a random sample of 300 incidents. Analyses of the communication variables have somewhat less power, due to the incomplete data caused by inaudible audio.

Coding Procedures

Codebook. The key to this analysis is the conversion of raw video and audio records into meaningful measurements, a process called *coding*. The finalized set of measures and coding instructions, called a *codebook*, were developed after a review of the study goals, an intensive review of the scientific literature, and an empirical examination of the content that could be discerned from the recordings. The actual content and quality of the recordings presented real

limitations on what measures could be reliably extracted from these interactions. Specifically, the single camera position (almost always 30–50 feet behind the stopped driver); low video resolution; single, lapel-style microphone on the officer; and high ambient noise limited the measurements that could be taken from analysis of the recordings.

The year-three codebook has only minor changes from the year-two codebook used on the 2005 data, which was itself an adaptation from the year-one codebook. The development process for the year-one codebook can be found in the year-one report, along with a comprehensive list of constructs included. The entire year-three codebook, along with detailed descriptions and instructions, is contained in Appendix A.

Coder Training. Four graduate students at the University of Illinois at Urbana-Champaign worked as coders during the codebook development. Individuals were recruited in the speech communication department and screened to obtain those with strong academic records. The coders are from the Midwest region (two from Ohio) and have different racial backgrounds. The coders were the same as the ones used for the year-two report. Retraining for year three was accomplished with approximately 10 hours of instruction in a small seminar setting on coding interpersonal interactions, followed by extensive practice with the incident recordings. During the training, all coders would independently code several recordings. The responses of the coders were then compared to ensure that there was a high level of agreement. When disagreements among coders existed, the differences were discussed as a group. For items that caused regular disagreement, additional instructions or examples were added to the codebook to document the coding procedure. Training continued until the average interrater reliability across all of the items was 0.85.

Coding Procedures. Once training was complete, each of the 318 incidents was randomly assigned to a coder. Coders were not given information about the race of the officer or driver from the contact cards; however, racial information was often available from the recording itself at some point during the incident. Coders viewed each recording alone and could watch the entire incident, or any segment of it, as many times as necessary to make the required coding judgments. Data for most incidents were obtained from a single coder. For this reason, it was essential to demonstrate that the coding process maintained a strong and consistent level of performance over time to ensure reliability of the data. To assess this, all coders were asked to code a common set of eight incidents at five points in the coding process, for a total of 40 incidents. By looking at the agreement among coders on these incidents, we monitored the ongoing reliability of the coding procedure. The overall results of these analyses indicated a high level of interrater reliability on virtually all variables, with no evidence of coder fatigue over the course of the study.

Analysis

The basic analyses are designed to describe how a range of possible outcomes measured from the recordings (e.g., stop characteristics, officer behavior, driver behavior, and communication variables) were related to (a) the officer's race, (b) the driver's race, and (c) the similarity between the races of the officer and driver. For most of the objective characteristics of the stop (e.g., duration, number of vehicle occupants, infraction type, citation issued), we assessed these three types of racial differences for each stop characteristic. As described in our year-one report, communication measures were designed to be grouped into scales rather than analyzed individually. This helps to limit the number of separate statistical hypotheses that were

tested—and thus limit exposure to false positive statistical errors. We analyze two communication scales in this report: officer communication quality and driver communication quality.

We used a range of statistical methods to assess the associations between the racial groups and the outcomes that were coded from the recordings. For dichotomous or polytomous outcomes, we used the χ^2 test of independence and logistic regression to assess for differences as a function of the officer's race, the driver's race, and the similarity between the races of the officer and driver. For continuous outcomes, we used analysis of variance (ANOVA) and analysis of covariance (ANCOVA) to assess for differences as a function of the officer's race, the driver's race, and the similarity between the races of the officer and driver. These are common statistical techniques used to ensure that we can make appropriate generalizations to a broader population given the limited sample of incidents and the reliability of our measures.

In general, each type of race effect reported (mean differences across groups defined by officer race, driver race, or racial similarity) is controlling for the other two effects. For example, if we report a difference in the probability of being searched across black and white drivers, that difference controls for any additional effects of officer race or racial similarity. The proper interpretation of that effect is that white and black drivers differed in the probability of being searched *regardless* of the officer's race or racial similarity between the driver and officer.

We implemented additional statistical controls when analyzing the officer's or driver's communication quality. These communication variables are inherently reciprocal across the individual within an interaction (e.g., Giles and Smith, 1979); an individual's communication quality typically rises, or sinks, to the communication level of his or her interlocutor. Because of this interdependence, we controlled for the driver's communication quality when assessing predictors of the officer's communication. Similarly, we controlled for the officer's communication quality when assessing predictors of the driver's communication. For example, when looking at the average communication level for black versus white drivers, we adjusted the results to account for the possibility that police officers could, on average, communicate differently to black versus white drivers. This ensured that black drivers were being compared to white drivers who were treated similarly by the officers. In several instances, we performed additional analyses that employed more complex multivariate models to better understand the nature of the observed effects.

Because of the large number of measures being examined, we present findings only when statistically significant ($p < 0.05$) differences were found. For example, if we discuss a difference between black and white drivers in the proportion of stops involving searches but do not present data on the proportion of searches as a function of officer race, the reader should assume that no reliable differences as a function of officer race were found. In interpreting "nonresults," it is important to keep in mind that not finding a significant difference does not ensure that no difference exists. It is possible that important differences exist in the full population of traffic stops but were not found in the random sample of 318 records analyzed.

Results

Data Quality

Coders assessed several aspects of the quality of the audio or video recording. In the majority of sampled incidents, the interaction between officer and driver was clearly visible, and their speech was audible and intelligible. However, some recording-quality problems resulted

in missing data on specific measures (see Table 4.1). The most important recording-quality problem was the intelligibility of the audio. In slightly more than one-quarter of the recordings, the audio did not allow measuring the officer's speech, the driver's speech, or both. The sample size for these analyses is reduced to 198, which results in slightly less analytic power for communication-outcome analyses than for the stop-characteristic outcomes. Because most of the communication effects found in years one and two were medium or small, the current amount of power makes it likely that we will fail to find some of the significant communication effects observed in the year-one data.

Differences in Incidents as a Function of the Driver's Race

Several differences in the circumstances of the motor-vehicle stop were associated with the driver's race (see Table 4.2). Black drivers were, on average, carrying more passengers. A lower proportion of the stops of black drivers occurred due to moving violations (e.g., speeding, failure to stop) than for white drivers. The analysis cannot indicate the reasons for these different types of stops for black and white drivers. These differences could, for example, occur because white drivers had different rates of certain types of infractions, because whites were more likely to be driving in areas in which the police had different enforcement practices, or because the driver's race was influencing the officer's behavior.

There were also several differences in the characteristics of the stop itself for white drivers relative to black drivers. These differences indicate that black motorists experience more proactive or intensive policing than their white counterparts. The stops of black drivers took an average of 2.7 minutes longer than for white drivers (25 percent longer), and they were more likely to involve multiple police officers. In addition, black drivers and their vehicles

Table 4.2
Differences in Stop Characteristics as a Function of Driver Race

Characteristic	Black Drivers	White Drivers	n	Significance
Mean number of passengers	0.46	0.23	317	<0.01
Stop was for a moving violation	70%	80%	264	<0.05
Mean duration of stop (minutes)	13.4	10.7	318	<0.01
Mean number of officers at scene	1.6	1.3	317	<0.001
Driver asked about drugs or weapons	16%	7%	254	<0.05
Visual search for probable cause	14%	4%	317	<0.01
Passenger was searched	4%	0%	315	<0.05
Vehicle was searched	8%	1%	317	<0.01
Driver told they are getting a "break"	48%	30%	253	<0.01
Officer leaves with a pleasant word	65%	77%	243	<0.05
Mean driver-communication quality	7.3	7.7	189	<0.01

NOTE: *n* gives the number of nonmissing observations on each variable. Higher values of communication quality indicate a better communication style. The mean levels of driver-communication quality are adjusted for several additional factors, including the driver's age and sex and the officer's age, sex, and communication quality. Significance tests for racial differences for *Officer leaves with a pleasant word* are conducted while controlling for the driver's age and sex and the officer's age, sex, and communication quality.

were more likely to be investigated for illegal items. Relative to white drivers, blacks were much more likely to (a) be asked if they were carrying drugs or weapons, (b) have the officer look through the windows to obtain probable cause, (c) have a passenger searched, and (d) have the vehicle physically searched. Racial differences in the circumstances of the stop as well as in the stop characteristics were very similar to both the year-one and year-two results, with no significant changes across this interval.

The observed differences in stop characteristics may not be directly caused by the driver's race. While these results show an association with driver race, the reason for the differences could be any factor that is correlated with driver race. For example, black drivers may be more likely to be stopped in high-crime neighborhoods than are their white counterparts. This could lead to higher rates of searches of black motorists, even if the officer did not consider the driver's race in the decision to search.

In addition to racial differences in stop characteristics, there were differences in the communication behavior of white and black drivers. Replicating findings from years one and two, black drivers had less positive communication quality on average than did their white counterparts. This difference persisted after controlling for the officer's communication quality, the stop characteristics, individual characteristics, and data-quality variables. Similar to findings from last year, officers were more likely to tell black drivers that they were "getting a break" on the citation (note: the rates of citation are not different across racial groups). However, officers are less likely to end the interaction with phrases like "have a nice day" or "take care" in interactions with black drivers. Although some drivers may interpret these benedictions as sarcastic—actually causing increased tensions—they are an expected component of almost all friendly interactions. These word-use differences persist even after controlling for a range of interaction characteristics, including the communication quality, or politeness, of the driver.

To better describe the communication-quality effect in terms of specific communication behavior, the researchers looked at the individual items that are combined to create the driver-communication quality scale. This analysis showed that, relative to white drivers, black drivers were less pleasant and less apologetic, indicated less listening, and were more argumentative (see Table 4.3). While the size of each of these effects is only medium or small by typical behavioral-science standards (Cohen, 1988), there is a consistent pattern across the items and across years.

Table 4.3
Specific Aspects of Driver Communication That Vary as a Function of Driver Race

Item	Driver Characteristic	Quality	Black Average	White Average	Standard Deviation	Effect Size[a]
100	Argumentative	Negative	0.8	0.2	1.34	0.44
90	Listening	Positive	5.4	5.9	1.24	–0.42
89	Pleasantness	Positive	5.5	5.9	1.29	–0.31
96	Apologetic	Positive	3.2	4.0	2.63	–0.29

NOTE: The listed items made the largest contribution to the observed racial difference in drivers' communication quality. Effect size is measured by Cohen's D, with 0.50 typically considered a medium-sized difference and 0.20 typically considered a small difference. For full definitions of specific items, see the codebook definitions included in Appendix A.

Differences in Incidents as a Function of Officer Race

Unlike in the results of 2004 and 2005, data from 2006 indicated several differences in the average behavior of white and black officers (Table 4.4). We did replicate the one effect from previous years: the tendency for black officers to use their names. However, we also found evidence of significant differences in procedures. White officers were more likely to look into cars in an effort to obtain probable cause; they were more likely to require identification from passengers in the cars; they were more likely to stop cars for nonmoving violations (most typically equipment or registration violations); and they stopped cars that had, on average, more passengers. This is a consistent pattern of effects suggesting that white officers are using more proactive police tactics in their traffic stops, using the traffic stop as a means to investigate possible drugs, weapons, or warrants. In contrast, a larger portion of the stops by black officers are classic traffic stops in which the driver is pulled over for a driving infraction, given a ticket, and allowed to leave.

Differences as a Function of the Racial Similarity Between Officers and Drivers

Data from 2006 revealed fewer significant effects of the racial similarity between drivers and officers than did 2005 data. The only significant effect was on the likelihood of having the vehicle searched. When officers and drivers were of the same race, only 2 percent of all vehicles were physically searched. When they were of different races, 6 percent were searched ($n = 317$, $p < 0.05$).

Differences That May Give an Appearance of Racial Bias

The differences we observed in the behavior of white versus black officers, or between racially matched and unmatched interactions, have the potential to give an appearance of racial bias. A given driver, either white or black, may believe that he or she is being treated differently based on the officer's prejudices. Whenever that driver is actually treated differently by black and white officers, the driver's attribution to racial bias is likely to be strengthened.

To investigate which stop characteristics may reinforce beliefs of racial bias, we break down the variables on which we found either officer-race effects or a race-matching effect so that we can look at those effects separately for black and white drivers. These are contained in Table 4.5.

The pattern of effects is very similar across all four of these variables. Black drivers may notice several differences in the stop based on the race of the officer who stopped them. In each

Table 4.4
Differences in Stop Characteristics as a Function of Officer Race

Characteristic	Black Officer	White Officer	n	Significance
Officer uses name	28%	12%	253	<0.01
Visual search for probable cause	5%	14%	317	<0.01
Passengers required to give ID	3%	41%	79	<0.001
Stopped for a moving violation	83%	67%	264	<0.01
Mean number of passengers	0.28	0.41	317	<0.05

NOTE: n gives the number of nonmissing observations on each variable. Percentage of passengers is computed based on the number of vehicles containing passengers rather than all incidents.

Table 4.5
Stop Characteristics as a Function of Both Officer and Driver Race

	Black Driver		White Driver	
Characteristic	**Black Officer**	**White Officer**	**Black Officer**	**White Officer**
Stop was for a moving violation (%)	82[a]	57[a]	84	77
Passengers required to give ID (%)	5[a]	48[a]	0[b]	33[b]
Visual search for probable cause (%)	8[a]	20[a]	1	8
Vehicle is searched (%)	4[a]	12[a]	1	0
Mean number of passengers	1.4	1.5	1.1	1.3

NOTE: Percentage of passengers is computed based on the number of vehicles containing passengers rather than all incidents.

[a] Significant effect of officer race when the driver was black ($p < 0.05$).

[b] Significant effect of officer race when the driver was white ($p < 0.05$).

case, this may lead to an appearance that they are treated with more suspicion when stopped by a white officer. The stop is less likely to be for a moving violation; they are more likely to be searched; and passengers are more likely to be asked for ID. Among white drivers, the only significant effect of officer race is for having passengers asked for their ID, which is more likely to occur when the officer is white.

Similar to last year's results, there appears to be the most proactive policing in the black driver–white officer combination. For each of the five variables in Table 4.5, that combination is significantly different from the average of the other three combinations ($p < 0.05$). This year, however, this is largely attributed to greater proactive policing by white officers rather than due to race-matching effects.

Predictors of Constructive Officer-Driver Communication

To better understand the factors that are associated with pleasant and productive interactions between officers and the community, we explored factors that were associated with high communication quality. This was done by estimating two separate multivariate-regression models predicting driver and officer communication quality from a wide range of stop characteristics, demographic factors, and communication variables. As in the previous two reports, the best predictor for good officer communication was good driver communication and vice versa. These effects remain strong even when controlling for all available stop and personal characteristics. Regardless of whether the stop was in the day or night, ended in a warning or an arrest, was by a man or a woman, the quality of each person's communication tended to rise or sink to the level of the other.

Differences Between 2006 and Earlier Data

In general, the results largely replicate the findings of previous years. However, there were several significant findings in year-one or -two data that were not significant in year-three data. Most notably, there were several race-matching effects in years one and two that were not significant this year, including effects on communication quality (in 2004 data) and stop duration (in 2005 data). These changes in significance should be anticipated due to the modest analytic power to detect small effects with 300 incidents. In other words, the failure to find

this effect in year three should not be interpreted as evidence that it does not exist. A direct comparison of 2006 data to both 2005 and 2004 did not reveal significant changes in officer communication or total time. For example, the magnitude of the race-matching effect on stop duration was nearly the same this year as last year; however, it was significant at the critical $p < 0.05$ level last year and was found to be $p = 0.08$ this year. Similarly, we found significant evidence in 2006 data that white officers were more likely than black officers to ask for passenger ID and stop vehicles for technical violations. This same trend was in last year's data (and can be computed from Table 4.5 in last year's report), but it was not strong enough last year to rise to the level of $p < 0.05$ significance.

The only significant changes from last year are on the data-quality variables. On those, we found significant reductions in the number of recordings not found.

Discussion

The random sample of video records analyzed sheds light on the nature of ordinary interactions between Cincinnati's citizens and its police. One key finding that sets the background for understanding these interactions is that, on average, blacks and whites experienced very different types of policing. White drivers typically experienced traffic stops that were shorter and were less likely to involve an investigation beyond the original vehicle infraction—inquiries and searches for drugs, weapons, or contraband. This finding is generally consistent with the descriptive findings presented in Chapter Three (prior to adjusting for neighborhood, time of day, and other explanatory variables), although the video analyses use independent observers to determine stop characteristics rather than the officers' self-reports.

As we discussed in earlier reports, the fact that black citizens are typically subjected to more intensive and time-consuming traffic stops may be a significant barrier to improved police-community relations. There are several plausible reasons for these differences in stops other than racial profiling, including different neighborhood enforcement techniques or differences in the types of infractions committed by whites and blacks. However, the longer, more invasive traffic stops that black drivers experience are likely to contribute to a more negative attitude in future interactions with the police.

These concerns about enforcement patterns are increased in this year's report because there is evidence that these differences in the stops of black and white drivers, when combined with differences in the behavior of white and black officers, may reinforce an appearance of bias. Although this is different from our finding from last year that police officers were more proactive when they were of a different race from the driver, the practical effect is quite similar: The combination of white officers and black drivers has the highest rates of searches, stops for technical violations, and investigation of passengers. While some community members may view this result as evidence of racial profiling, there are other plausible explanations that we cannot rule out with the existing data. White officers may be given different assignments or duties than black officers, or they may have a different understanding of their assignments for reasons that are not directly related to race (e.g., seniority, neighborhood of assignment, shift being worked). Because we do not rule out several factors that may be correlated with officer race, we do not conclude that this indicates racially biased policing. However, the nature of these effects is consistent with the fundamental asymmetry in outcomes that typically indicates racial discrimination against nonwhites: White officers are more aggressively policing

black neighborhoods than are black officers. This reinforces the cultural beliefs about racial discrimination.

Regardless of the ultimate cause of these effects, the fact that the more invasive traffic stops that black drivers experience occur primarily when they have been stopped by white officers should be expected to contribute to more negative attitudes within the black community. This problem is exacerbated by the fact that white officers conduct approximately two-thirds of all stops of black motorists, so any problems in these interactions are likely to affect a large number of African-Americans. Improving relations between CPD and this community will likely require efforts to ensure that white and black officers act similarly when stopping motorists.

Consistent with findings from earlier years, we found that black drivers had a more negative communication style in traffic stops than did white drivers. Relative to blacks, white drivers were more likely to apologize for the infraction, were more likely to use phrases that indicate courteousness, and were less likely to argue with the police. These communication differences persisted even after controlling for all of the measured stop characteristics. Given findings presented in the year-one report that blacks in the community at large have a more negative view of CPD, it appears likely that this dissatisfaction affects their communication with officers. On the other hand, the differences in communication could reflect different cultural standards of expression, even when underlying attitudes are quite similar (e.g., Hecht, Jackson, and Ribeau, 2003).

Suggestions for Improvement

Correlational research has a very limited ability to identify the ultimate causes of what we observe. Thus it is difficult to know whether the inequalities we have found are caused by racial bias or are the unintended outcome of policies and circumstances that are race blind. Regardless of the cause of the observed inequalities, we believe that they represent a significant barrier to improved police-community relations. Several steps could be taken to remove these barriers.

First, it may be possible to make improvements in relations between CPD and the black community by rethinking how black neighborhoods are policed. The proactive policing of motor vehicles that occurs in these communities (longer stops, more searches) is likely to put a high burden on law-abiding members of these communities, and it may not match the policing priorities of these communities. The high-crime neighborhoods may want more police assistance with drugs and violent crime, but what they are getting is more tickets for expired registrations, more time having their passengers investigated, and more instances of being patted down in public. This type of aggressive policing will certainly help to apprehend some offenders (e.g. Koper and Mayo-Wilson, 2006; Skogan and Frydl, 2004; and Sherman, 1990), but it may have high costs on community relations. Efforts should be made to identify methods of targeting the specific offenses that are a concern to the community while minimizing the impact on community members who are not involved in those offenses.

Secondly, efforts should be made to ensure that black and white officers are consistent in their enforcement priorities and methods. The continued, large discrepancy in the investigation of passengers during traffic stops suggests that there is no enforced CPD policy governing this procedure. Similarly to last year, we recommend that specific guidelines be developed to determine when officers should run ID checks on vehicle passengers who have not, themselves, been observed violating any law. We also suggest that these guidelines reflect the inconvenience

to law-abiding passengers that result from an ID check, as well as the low proportion of arrests that can be attributed to these ID checks. We also suggest that clear traffic-enforcement priorities be communicated to officers. White officers appear to be pursuing technical violations at a greater rate than are black officers in the same situation. Clear tasking and enforcement priorities may reduce this discrepancy. To best improve police-community relations, policies that determine enforcement priorities for moving versus technical violations should reflect the priorities of the community being served.

The results from year three also replicated several of the communication problems that were found in previous years. Black drivers continued to be less polite and cooperative in these interactions. The current data demonstrate that, for both the driver and the officer, their interlocutor's behavior is highly dependent on their own behavior. Drivers and officers who were argumentative, impolite, or indifferent were rewarded with a more unpleasant interaction.

Community members also have a role to play in the improvement of police-community relations. While negative communication by black drivers may be a reaction to the more proactive policing they have experienced, it is likely to be counterproductive. Even if one's dissatisfaction with CPD was entirely justified based on past experience, treating an individual officer with disrespect is likely to increase the inconvenience caused by the current stop and to impede the long-term improvement of police-community relations.

Limitations

There are several limitations to our analysis of the audio-video recordings. One primary limitation is that it uses observational data, and we cannot match black and white drivers on the full range of situational factors (e.g., neighborhood of stop). These methods allow us to describe what typically occurs in these interactions, but we cannot know definitively why it happens. Because of this limitation, the reader should avoid assuming a specific cause of the effects we report. For example, the reader should not conclude from our study that the police chose to search black motorists, or hold them longer, *because* they are black.

Conclusions

An analysis of 318 randomly sampled video records revealed three key differences associated with the officers' and drivers' races: (a) black drivers were more likely to experience proactive policing during the stop, resulting in longer stops that were significantly more likely to involve searches, (b) white officers were more likely than black officers to use proactive police tactics, (c) white drivers' communication quality was more positive than of the black drivers—specifically, it was more apologetic and less argumentative.

Although the original causes for these differences are unknown, we believe that reducing them is important for improving the relationship between CPD and the community it serves. These improvements will likely require a closer alignment between police practices and community priorities, the implementation of policies to ensure that white and black officers use similar operating procedures, as well as efforts by individual officers and citizens to minimize the inconvenience and irritation caused by traffic stops.

CHAPTER FIVE

Summary and Conclusions

This third-year evaluation reports on key issues that are analyzed in every annual report from this study. These issues include the context of crime in Cincinnati, the analysis of motor-vehicle stops, and the analysis of video records. In addition, this report provides the first assessment of a specific CPD crime-control tactic—Vortex—that has been implemented.

Data Issues

Missingness of data is rapidly diminishing as an issue for the analysis. Indeed, the improvements from the year-one report are substantial. While *any* missing and poor-quality data (in the case of the audio and video quality of some of the tapes) can pose a threat to the analysis to the extent that it is systematic or correlated with an outcome of interest, those constraints do not appear to apply here.

Progress Toward the Goals of the Collaborative Agreement

The collaborative agreement identifies five areas that it is intended to address: the development of proactive police-community partnerships on problem-solving; building relationships between the police and the community; improving CPD's staffing, training, and management practices in several dimensions; ensuring fair and equitable treatment for all members of the community; and developing methods to increase support for the police. This annual report is based on only a few of the many data sources needed to fully evaluate these goals, and we cannot provide a final or comprehensive evaluation of the collaborative agreement in the year-three report. Nevertheless, we can draw some conclusions about key questions regarding the status of police-community relations in Cincinnati.

Our assessment remains largely the same as last year's: While there are generally no overt signs of racial discrimination in enforcement patterns, there are racial disparities in the incidence and aggressiveness of enforcement. Specifically, black residents, by virtue of where they live, how the police department allocates officers, and other factors, are more likely to encounter enforcement in general and more likely to encounter enforcement of a particularly proactive nature. The outcomes of the law-enforcement encounters may be very similar across the races, but, all other factors being equal, blacks experience interactions with the police more frequently than whites do.

To a great extent, Vortex epitomizes these disparate experiences. Vortex appears to have contributed to some reductions in crime in Over-the-Rhine. Yet, as we noted last year, such strategies place a greater burden on law-abiding residents living in the areas where the enforcement occurs. It is not clear whether Vortex includes any elements that are designed to minimize official contact with law-abiding citizens while still targeting the underlying crime issues. To the extent that such strategies exist, they should be carefully considered and publicized before the Vortex strategy is deployed in other parts of the city where crime is increasing.

We also reiterate that, while it may not be possible to field a proactive enforcement strategy that is racially neutral, much of the force's interaction with the citizenry comes through vehicle stops. The quality, tenor, and tone of such stops are largely under police control. The department should thus pay special attention to training to ensure that these interactions are conducted consistently, courteously, and professionally. Such improvements would be strong signals of CPD's accountability and responsiveness to oversight.

APPENDIX A

Details of Propensity-Score Weighting

We used propensity-score weighting to reweight stops from some comparison group to have the same distribution of features as the stops in a reference group. The choice of reference and comparison groups differs by the analytical question being addressed.

Stops in the comparison are weighted and are not technically included or excluded from the sample. The weights are constructed in such a way that any weighted statistic of the comparison group (e.g., weighted average age, weighted percentage from neighborhood A, weighted percentage stopped between midnight and 4 a.m.) will match the same unweighted statistic computed for the reference group.

Let $\mathbf{x}$ represent the collection of stop features and t be a binary indicator that the stop is a member of the reference group. The distribution $f(\mathbf{x}|t=1)$ represents the conditional distribution of stop features for those stops in the reference group, and $f(\mathbf{x}|t=0)$ represents the distribution of features for stops in the comparison group. We want to weight the latter distribution so that

$$f\left(\mathbf{x} \mid t=1\right) = w\left(\mathbf{x}\right) f\left(\mathbf{x} \mid t=0\right),$$

where $w(\mathbf{x})$ is the weighting function of interest to us. Solving for $w(\mathbf{x})$ and applying Bayes' theorem to the numerator and denominator yields

$$w\left(\mathbf{x}\right) = Kf\left(t=1 \mid \mathbf{x}\right) \Big/ f\left(t=0 \mid \mathbf{x}\right),$$

where K is a constant that will later drop out of the analysis. The right side of the expression is proportional to the probability that a stop with feature $\mathbf{x}$ is in the reference group divided by the probability that a stop with feature $\mathbf{x}$ is in the comparison group.

This indicates that, for a comparison group stop with feature $\mathbf{x}$, we should apply a weight equal to the odds that a stop with feature $\mathbf{x}$ was in the reference group. Note that, if reference-group stops rarely occur in neighborhood A, for example, then all comparison-group stops made in neighborhood A will receive a weight near 0. On the other hand, comparison-group stops with features much like those of the reference group's will receive large weights.

To estimate $f(t=1|\mathbf{x})$, we use a nonparametric version of logistic regression. See McCaffrey, Ridgeway, and Morral (2004) for complete details. We evaluate the quality of the weights by how well the distribution of the features matches between the reference group and the weighted stops in the comparison group.

APPENDIX B

Estimating False-Discovery Rates

Fridell (2004) notes that a popular statistic for measuring the difference between an officer's nonwhite-stop fraction and the officer's internal benchmark is the *z*-statistic,

$$z = \frac{p_t - p_c}{\sqrt{\frac{p_t(1-p_t)}{N_t} + \frac{p_c(1-p_c)}{N_c}}}. \qquad \text{B.1}$$

In this measure, p_t and p_c are, respectively, the proportion of stops involving nonwhite drivers for the target and the weighted comparison stops. The denominator normalizes this term to have variance 1. This statistic is computed for all officers under consideration. In standard circumstances, z will have a standard normal distribution, and there will be a 5 percent probability that the absolute value of z exceeds 2.0 when there is no difference between the officer's stop rate and the internal benchmark. However, in a collection of 294 *independent* comparisons with no racial bias, we should expect about 15 (5 percent of 294) officers to have z-statistics exceeding 2.0 by chance. Thus, flagging officers with z exceeding 2.0 is bound to select officers with no racial biases. Further complicating matters is that the 294 z-statistics are *not* independent. They are correlated with each other, since each officer might be used in another officer's internal benchmark. In this case, the empirical distribution of the zs may be much wider (or narrower) than would be predicted by statistical theory (Efron, 2006).

Benjamini and Hochberg (1995) pioneered the use of the false-discovery rate (fdr) as an alternative methodology for locating truly extreme values in multiple comparison situations. The fdr is the probability of no group difference given the value of an observed test statistic, z (Efron, 2004).

We can derive the probability of an officer being an outlier as

$$\begin{aligned} P(\text{outlier} \mid z) &= 1 - P(\text{not outlier} \mid z) \\ &= 1 - \frac{f(z \mid \text{not outlier})\, f(\text{not outlier})}{f(z)} \\ &\geq 1 - \frac{f_0(z)}{f(z)}, \end{aligned} \qquad \text{B.2}$$

where $f_0(z)$ is the distribution of z for nonoutlier officers and $f(z)$ is the distribution of z for all officers (Efron, 2004). If the fraction of problem officers is small (less than 10 percent), the

bound in the last line of Equation B.2 is near equality. We estimate $f_0(z)$ with the empirical null, assuming normal but with location and variance estimated using only the central data of the distribution.

We used the R package locfdr 1.1-4 for this analysis' calculations.

APPENDIX C

American Civil Liberties Union Response to Year Three Report

This appendix contains the ACLU's response to this report. We have not altered it in any way.

Appendix by ACLU to Year 3 Rand Report

This report challenges the parties to the Collaborative to refocus on our central mission – making sure that our reforms translate into policing measures that are racially fair and perceived as such by the African American citizens in this City. This report, like its predecessors, confirms that African Americans experience policing very differently than white Cincinnatians. The parties have started a focused program to communicate with the community at large about the Collaborative reforms and how they are intended to improve police relations with the African American community. The Rand Report points us to several areas where action is needed now to reduce the disproportionate impact of some police practices:

1. Traffic Stops. Rand's analysis again confirms that African Americans are more likely than white drivers to experience searches, passenger ID checks and other proactive actions during traffic stops. The frustration of African American drivers is evident in the videotape analysis of various stops as they are frequently impatient and suspicious toward the police officer. The parties should study the causes of this disparity and take steps to end it. Enforcement priorities and methods should be applied consistently to all drivers and by all officers. Actively engaging the community in training and policy explanation may help improve the traffic stop experience. Plaintiffs will seek to secure actual traffic stop videos to assist in community dialogue with the police on this issue.

2. Individual Officer Traffic Stop Issues. Five officers were identified as making racially disproportionate traffic stops. CPD has the software to identify these officers and has undoubtedly noted these facts in the ETS. The CPD should examine the conduct of these officers and take appropriate action if in fact there is no law enforcement reason for their actions. The CCA may also wish to examine these facts.

3. Vortex. Rand notes that in Over the Rhine, crime was down but arrests are up for the second year in a row. Those arrests are approximately 75% African American. To the extent they follow a Vortex strategy of zero tolerance, it means that many African Americans are being arrested for minor matters that are not resulting in arrests in Hyde Park or other white neighborhoods. This type of proactive policing has an adverse impact on African Americans and should be eliminated. The parties have moved this past year to more fully implement problem solving, which should reduce dependence on Vortex style strategies in African American neighborhoods.

4. Neighborhood Basis for Police Response. Crime and disorder tends to be more concentrated in African American neighborhoods. That means that strategies that more directly target that crime will reduce the collateral consequences of other crime reduction strategies that are more blunt and less precise. Full implementation of problem solving will reduce these collateral consequences and should improve the experience of African Americans when officers police these neighborhoods.

APPENDIX D

Cincinnati Police Department Response to Year Three Report

This appendix contains CPD's response to this report. We have not altered it in any way.

Cincinnati Police Department's Response to RAND's Year Three Evaluation

The Cincinnati Police Department is pleased that the majority of the issues addressed in the Collaborative Agreement have been resolved as we move into one additional year for monitoring progress of problem-solving efforts. RAND again reported improvement in the quality of data provided to them for analysis. As we have maintained throughout the Agreement, we welcome analysis of our actions because it is via this transparency that we build community trust.

RAND's analysis continues to show that crime, calls for service, arrests, and use of force by police are geographically clustered in Cincinnati. While the analysis indicates some have concluded that increased arrests and increased attention to Over-the-Rhine with the inception of the Over-the-Rhine Task Force were responsible for the reduction in crime, we maintain the changes were the result of community partnerships to address the many problems facing this area. Portions of Over-the Rhine were the test-bed for the now well accepted Neighborhood Enhancement Program. The results of focusing all City Departments and community stakeholders on the deeper quality-of-life issues resulted in a significant drop in crime and calls for service in this community. Partners in this endeavor included Keep Cincinnati Beautiful, various City Departments responsible for infrastructure and code enforcement, the Cincinnati Human Relations Commission, local developers, social service agencies, area schools, community groups, and citizen volunteers of all ages, to name a few. This effort is truly macro Community Problem Oriented Policing in action.

As noted by RAND, there has been some shift in crime's effect on other communities. Additional analysis led to the identification of three areas: portions of East and West Price Hill, Avondale, and Northside, in 2007, for similar, but community specific efforts. We anticipate seeing additional changes in next year's analysis.

RAND's analysis shows that trends across the last four years of traffic stop data analysis provide no evidence of racial profiling in officers' decisions to stop drivers. As a result of information presented in the Year One report regarding individual officers falling outside the expected norm on traffic stops, we requested assistance from RAND in order to develop the in-house ability to perform in-depth analysis of traffic stop data at an individual officer level. This issue was again addressed in the Year Two report; however, analysis to the officer level remained beyond the Department's technical and analytical capabilities during 2006. In early 2007 our continued work with RAND researchers resulted in our ability to conduct this analysis. Officers' Contact Cards are analyzed and compared on a quarterly basis by the Department. Officers stopping drivers of either race at substantially higher rates than situationally matched stops are reviewed as part of the Employee Tracking Solution quarterly risk management analysis.

The separate analysis of stops made by officers assigned to the Over-the Rhine Task Force and later the Vortex Unit, did not produce surprising results. As indicated, these officers were assigned a very focused mission; to locate and apprehend violent and drug offenders. RAND's own analysis indicated crime clusters in particular areas. These officers focused on these type offenders in the identified high criminal activity areas. Then additional stakeholders had a foothold to implement long term strategies to take back these areas.

While the analysis of traffic stop data and trend results of the past three to four years again found no evidence of racial bias on either the officer's decision to stop or search patterns post stop, the subjective analysis of video tapes of traffic stops continued to show some interracial issues. Again, as this analysis does not match stops looking at similar circumstances, we believe there are some very plausible explanations for many of the differences identified.

During 2006 and 2007, the Department conducted a professional traffic stop training course entitled "Cross Cultural Communications" for all sworn personnel at all ranks throughout the Department. The curriculum was designed to ensure that African American and white officers consistently treated drivers with courtesy and respect regardless of race. The goals of the training are as follows:

Review Key Findings of Rand Report
Understand How Our Perceptions Shape Reality
Review Key Components of "Bias-Free Policing"
Learn Strategies for Overcoming Perceptions of Racial Profiling
Understand the Dynamics of Courtesy and Power

See the below excerpt from the Independent Monitor's 19th Report.

The Collaborative Agreement requires that all Parties cooperate in the ongoing training and dissemination of information regarding the Professional Traffic Stops/Bias-Free Policing Training Program. In 2006, Mr. Barry Webb, Lieutenant Anthony Carter and Sergeant Tom Tanner of the Police Academy, and Mr. S. Gregory Baker, developed a "Cross Cultural Communications" course. The course was presented to all police supervisors in October and November 2006, and was presented to all police specialists and officers in 2007. The class was conducted in a two and a half hour course between January and April 2007, spread out over 29 sessions. According to the CPD, spirited dialogues have transpired promoting further thought and reflection among officers. The course addresses the Racial Profiling Traffic Stop Study and the perceptions of African Americans and police officers in conducting traffic stops.

Beginning in April 2007, the Cincinnati Police Department in conjunction with other local, state and federal law enforcement agencies, a host of social service agency service providers, and the community leaders embarked on the Cincinnati Initiative to Reduce Violence (CIRV). Based on Professor David Kennedy's focused deterrence approach or "Pulling Levers," the initiative's goals are to:

Dramatically reduce homicides
Reduce incarceration
Strengthen relationships between law enforcement and communities
Help offenders
Address racial conflict

According to the methodology, 12 to 18 months are required to fully assess its effectiveness. At this time, although the homicide rate has decreased, we are unable to fully distinguish CIRV's contribution to the reduction from numerous other approaches both traditional and non-traditional. However, over 100 offenders have sought out services with over 70 fully engaged with "life coaches" participating in job training, substance abuse treatment, anger management, education and other programs.

We look forward to continued problem solving efforts with all partners in our communities, and we await the feedback from citizens being surveyed as part of the next RAND analysis. We encourage the parties to assist us in our efforts to garner greater participation in these problem-solving efforts by engaging citizens to take a more active role.

APPENDIX E

Monitor Response to Year Three Report

This appendix contains the monitor's response to this report. We have not altered it in any way.

CITY OF CINCINNATI
INDEPENDENT MONITOR'S
RESPONSE TO RAND'S THIRD ANNUAL EVALUATION REPORT:
POLICE-COMMUNITY RELATIONS IN CINCINNATI

December 2007

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INDEPENDENT MONITOR'S RESPONSE TO RAND'S THIRD ANNUAL EVALUATION REPORT: POLICE-COMMUNITY RELATIONS IN CINCINNATI

I. Purpose of the RAND Report

The Collaborative Agreement was developed "to resolve social conflict, to improve community-police relationships, to reduce crime and disorder…and to foster an atmosphere throughout the community of mutual respect among community members including the police" (CA ¶10). One important aspect of the Agreement is its requirement that the parties implement a system of evaluation to track whether the goals of the Collaborative Agreement are being achieved.

The Collaborative Agreement provisions call for a broad and comprehensive approach to evaluation. The RAND Corporation was brought in as a national expert in research, law enforcement and evaluation. The efforts undertaken by RAND in the Evaluation Protocol provide valuable information and lessons learned, that need to be used to improve police-community relations and advance the goals of the Collaborative Agreement.

II. Transition Year

In August 2007, the City and the Plaintiffs agreed to extend portions of the Collaborative Agreement for one additional year to fully implement the adoption of problem solving as the CPD's principal crime-fighting strategy. The Collaborative is more than an attempt to simply change police policies and procedures; instead, the Collaborative attempts to change how policing in Cincinnati is conducted and accomplished, so that it effectively enhances public safety and improves relations between the CPD and the African American community. If the problem solving approach is put into practice, we are confident that it will advance effective, respectful and publicly accountable policing in Cincinnati.

The shift in orientation to problem solving policing from a more aggressive, reactive policing approach can have a significant impact on improving police-community relations, which is one of the key goals of the Collaborative Agreement. However, by itself, implementing this shift during the Transition Year is not likely to entirely resolve the tensions between the police department and members of the African American community. As shown by this RAND report, further steps need to be taken in how officers relate and interact with citizens. It is thus even more crucial that the Parties and the larger Cincinnati community "fully and fairly" put the RAND Report data to good use (CA ¶46).

III. Results of RAND Report

RAND's 2007 Third Annual Report repeats many of the findings of its 2005 First Year Report and 2006 Second Year Report. "Blacks continue to bear a disproportionate share of the impact of policing" in Cincinnati (p. xv). Because of where black and white residents live in the city, and because of police decisions on deployment and crime control strategies, blacks and whites have very different experiences with policing in Cincinnati. Black residents are more likely than whites to live in neighborhoods characterized by crime and disorder, and residents in high-crime neighborhoods in Cincinnati are more likely to see "proactive policing" such as aggressive traffic enforcement, pedestrian stops, and officers patting down individuals on the street corner.

Calls for service, reported crime, arrests and police use of force are geographically clustered in particular neighborhoods – including Over-The-Rhine, the Central Business District/Riverfront and Avondale. On average, black residents in Cincinnati experience traffic stops that are longer, that are more likely to involve searches for drugs, weapons and contraband, and that are more likely to involve investigation of all of the vehicle's passengers. Black residents are also more likely than whites to be stopped for equipment violations. In addition, 75 percent of those arrested by the CPD in Cincinnati are black, and 75 percent of the incidents involving CPD use of force involve black subjects. The RAND Reports provide a powerful explanation for the wide gap in perceptions about policing between whites and blacks in Cincinnati.

A. Traffic Stop Review

RAND's review of traffic stops found no evidence of a department-wide pattern of racial bias in the decision to stop. When looking at what happens after the stop, black residents in Cincinnati are searched at a higher rate than nonblacks in Cincinnati, and they are stopped for longer periods of time. However, much of these differences can be attributed to factors such as the location and time of the stop, the reason for the stop, and whether the driver in the traffic stop had a valid driver's license. When RAND accounted for these factors and matched stops of black drivers with stops of similarly situated nonblack drivers, RAND found that officers searched black and "matched" nonblack drivers at nearly the same rates in situations where officers have discretion whether or not to search.

RAND also compared the stops of 294 officers who made more than 50 reported traffic stops in 2006. It compared the racial percentages of stops of each officer to the stops of other officers made in

the same neighborhoods and at similar times. Three of the 294 officers stopped black drivers at substantially higher rates than did other similarly-situated officers, while two stopped white drivers at a disproportionate rate.

In April 2006, the CPD instituted the Over the Rhine task force, and then in October this task force became the Vortex Unit, which implemented saturation patrols in high crime neighborhoods, including Over the Rhine. RAND conducted an analysis comparing the stops of Vortex officers (including Over the Rhine task force officers) with stops of other CPD officers patrolling the same neighborhoods at the same times as the Vortex officers. RAND found that Vortex officers stopped black drivers at a higher rate than other officers patrolling in the same neighborhoods. Vortex officers were also twice as likely as non-Vortex officers to use high-discretion searches.

B. Review of Traffic Stop Videos

As in the previous two RAND reports, the 2007 report includes a review of 318 randomly-sampled video recordings of Cincinnati traffic stops. In reviewing stops of black drivers by white and black officers and stops of white drivers by white and black officers, RAND reports three key findings.

First, black drivers were more likely to be pulled over for registration or equipment violations, and also more likely to experience proactive or intensive policing during the stop. Stops of black drivers took longer and were more likely to involve multiple officers, and black drivers were more likely to be asked whether they were carrying drugs or weapons, be searched, have a passenger searched, have the car searched, or have their passengers required to provide identification.

Second, several of these differences between the stops of white and black drivers were largely when the officer was white. As noted by RAND, the consistent pattern of white officers more likely to look into cars in an effort to obtain probable cause, require identification from passengers, and stop cars for equipment and registration violations, suggests "that white officers are using more proactive police tactics in their traffic stops, using the traffic stop as a means to investigate possible drugs, weapons or warrants" (p. 58). The fact that the differences in the stops of black and white drivers appeared to depend to a significant extent on the officer's race raises concerns for RAND and was most glaring for the Monitor. As RAND notes: "Black drivers may notice several differences in the stop based on the race of the officer who stopped them. In each case, this may lead to an appearance that they are treated with more suspicion when stopped by a white officer" (p. 59).

Third, white drivers' communications quality was more positive than that of black drivers – white drivers generally were more cooperative, courteous and apologetic, while black drivers tended to be more impatient and argumentative.

RAND notes that concerns about enforcement patterns are increased in this year's report "because there is evidence that these differences in the stops of black and white drivers, when combined with differences in the behavior of white and black officers, may reinforce an appearance of bias" (p. 60). Perceptions of bias lead to distrust of the police, and also provide an explanation for why black motorists have negative communications with CPD officers.

IV. Monitor's Response

The RAND First Year Report demonstrated a wide gap in perceptions between whites and blacks in Cincinnati that must be tackled. Similar findings were made in surveys by the NCCJ in 2006. These gaps must be reduced for the Collaborative Agreement's goals to be achieved. Central to this issue is the impact on the black community of decisions about police strategy.

In this Transition Year, the City and the CPD have committed to fully implementing CPOP and problem solving as the principal strategy for addressing crime and disorder. Employing more targeted and precise police tactics in fighting crime can have great impact on both police effectiveness and on improving police-community relations. We have seen some evidence of a more surgical approach by the CPD; for example its implementation of the Cincinnati Initiative to Reduce Violence (CIRV). However, even if many of the CPOP projects undertaken in 2008 are successful, the goals of the Collaborative Agreement will not be met and the formidable efforts of the last five years cannot be deemed a success, unless the Department is able to address the daily interactions between police officers and African American residents, as found by RAND in this report. These problems have been raised in the earlier RAND reports, but there is no longer time to debate over what steps to take. The dynamic between the African American community and the police must be addressed now.

A. Analysis

The first step that must be taken is for the CPD to assess, as best as possible, what accounts for the differences shown in Chapter Four of the RAND Report between white and black officers in their actions in

traffic stops. The RAND report notes that there are plausible reasons for these differences in stops, other than racial profiling; RAND could not make a conclusion based on its data. Black and white officers may have had different assignments or duties. For example, if the percentage of white officers in the Vortex Unit is higher than the white percentage of the CPD as a whole, and if the percentage of black officers in the Traffic Unit is higher than the black percentage of the CPD as a whole, that might explain why white officers engaged in more "proactive stops" (as RAND describes them) and why black officers engaged in less invasive speeding stops on the highway. Are there any other differences, for example in training of white and black officers that might explain the RAND data? These questions need to be answered.

At the same time, however, we need to recognize that some of the problems in Cincinnati are not unique to Cincinnati, but are prevalent throughout America, and not only in policing. We all bring our own experiences, backgrounds, assumptions, and unfortunately, our generalizations and stereotypes, to our work and our daily lives. These issues take time to resolve, and it may be that even at the end of the Collaborative Agreement in August 2008, this work will not be complete; but certainly there will not be progress unless a sincere effort is undertaken now.

B. Improved Traffic Stop Encounters

One prospect for improvement in police-citizen relations is better communications in traffic stop encounters. As RAND stated in the 2006 Second Annual Report, the Department should "pay special attention to maintaining and improving, where needed, the tenor and tone of these interactions" (xxii). Training for CPD members is part of that effort. The CPD did conduct cross cultural training in late 2006 and early 2007. We believe additional energy is needed, and this year's RAND report should be part of that training.

The Monitor and RAND have also called for additional efforts to involve community members, particularly black residents of Cincinnati, in improving police community relations. As RAND noted in its Second Annual Report, "[w]hile negative communications by black drivers may be an understandable reaction to the more proactive policing they have experienced, it is likely to be counterproductive" [p. 66]. Public education efforts are one way to accomplish this objective.

In addition, the Parties have discussed using some of the MVR tapes of actual traffic stops that RAND reviewed as a training tool for both officers and the public. Plaintiffs have again called for this endeavor.

A third, very targeted, recommendation that RAND made in its 2006 Second Annual Report and makes again in its 2007 Report is to ensure that black and white officers are consistent in their enforcement priorities and methods. The investigation of passengers during traffic stops is one example where white and black officers differ. RAND recommends that:

> specific guidelines be developed to determine when officers should run ID checks on vehicle passengers who have not, themselves, been observed violating any law. We also suggest that these guidelines reflect the inconvenience to law-abiding passengers that result from an ID check, as well as the low proportion of arrests that can be attributed to these checks (p. 61-62)

It is unclear whether the CPD took action on the recommendation from the 2006 RAND report; if not, action should be taken now.

RAND also recommends that "clear traffic enforcement priorities be communicated to officers" (p. 62). This would address the concern that white officers appear to be pursuing technical violations (such as equipment violations) at a greater rate than are black officers in the same situation.

B. Dialogue on Policing in Black Neighborhoods

In all three of its Annual Reports, RAND has called for a greater dialogue about how black neighborhoods are policed.

> [I]t may be possible to make improvements in relations between CPD and the black community by rethinking how black neighborhoods are policed. The proactive policing of motor vehicles that occur in these communities (longer stops, more searches) is likely to put a high burden on law-abiding members of these communities, and it may not match these communities' policing priorities [p. 61].

In our comments on RAND's Reports, and in our Monitor Reports, we too have urged this dialogue. The dialogue would include an examination of how and where arrests are made and how they correlate to reported crime; and the role of aggressive traffic enforcement and other "proactive" policing efforts, and how they fit in with the Collaborative Agreement. For example, aggressive traffic enforcement may engender greater distrust, and may not be effective in reducing crime or improving traffic safety.

The agreement to enter into a Transition Year is important evidence that the Parties recognize that the rift in views of the police by black and white residents of Cincinnati needs to be bridged. The City's commitment to problem solving and CPOP shows a sincere desire to implement effective and respectful policing.

As part of this effort, the Parties have worked to develop a community dialogue and communications project, funded by the Andrus Family Foundation. This project will communicate the progress of the Collaborative Agreement to stakeholder groups in the community, and will seek and respond to input from the community regarding their views on public safety, racial fairness, and police policies, practices and strategies. We look forward to assisting in this dialogue.

References

Ayres, Ian, "Outcome Tests of Racial Disparities in Police Practices," *Justice Research and Policy*, Vol. 4, No. 1, 2002, pp. 131–142.

Benjamini, Yoav, and Yosef Hochberg, "Controlling the False Discovery Rate: A Practical and Powerful Approach to Multiple Testing," *Journal of the Royal Statistical Society*, Series B: Methodological, Vol. 57, No. 1, 1995, pp. 289–300.

Cincinnati Police Department, Crime Analysis Unit, "January 2007 CINSITE: Crime, Disorder, Violence, and Drugs in Our Neighborhoods," briefing, January 2007. As of November 26, 2007: http://www.cincinnati-oh.gov/police/downloads/police_pdf5296.pdf

Cohen, Jacob, *Statistical Power Analysis for the Behavioral Sciences*, 2nd ed., Hillsdale, N.J.: L. Erlbaum Associates, 1988.

CPD—*see* Cincinnati Police Department.

Darley, John M., and Russell H. Fazio, "Expectancy Confirmation Processes Arising in the Social Interaction Sequence," *American Psychologist*, Vol. 35, No. 10, October 1980, pp. 867–881.

Devine, Patricia G., Sophia R. Evett, and Kristin A. Vasquez-Suson, "Exploring the Interpersonal Dynamics of Intergroup Contact," in Richard M. Sorrentino and E. Tory Higgins, eds., *Handbook of Motivation and Cognition*, Vol. 3: *The Interpersonal Context*, New York: Guilford, 1996, pp. 423–464.

Devine, Patricia G., and Kristin A. Vasquez, "The Rocky Road to Positive Intergroup Relations," in Jennifer L. Eberhardt and Susan T. Fiske, eds., *Confronting Racism: The Problem and the Response*, Thousand Oaks, Calif.: Sage Publications, 1998, pp. 234–262.

DHHS—*see* U.S. Department of Health and Human Services.

Efron, Bradley, "Large-Scale Simultaneous Hypothesis Testing: The Choice of a Null Hypothesis," *Journal of the American Statistical Association*, Vol. 99, No. 465, 2004, pp. 96–104.

———, "Correlation and Large-Scale Simultaneous Significance Testing," 2006. As of November 26, 2007: http://www-stat.stanford.edu/~brad/papers/Correlation-2006.pdf

Fridell, Lorie A., *By the Numbers: A Guide for Analyzing Race Data from Vehicle Stops*, Washington, D.C.: Police Executive Research Forum, 2004. As of November 26, 2007: http://www.policeforum.org/library.asp?MENU=229

Giles, Howard, and P. M. Smith, "Accommodation Theory: Optimal Levels of Convergence," in Howard Giles and Robert N. St. Clair, eds., *Language and Social Psychology*, Oxford: B. Blackwell, 1979, pp. 45–65.

Green, Saul, and Richard B. Jerome, *Monitor's Report on University Of Cincinnati Police Vehicle Stop Study*, Cincinnati, Ohio, November 14, 2003.

———, *Monitor's Report on University of Cincinnati Police Vehicle Stop Study*, May 1, 2007.

Grogger, Jeffrey, and Greg Ridgeway, "Applications and Case Studies: Testing for Racial Profiling in Traffic Stops from Behind a Veil of Darkness," *Journal of the American Statistical Association*, Vol. 101, No. 475, 2006, pp. 878–887.

Hallmark, Shauna L., Kim Mueller, and David Veneziano, *Evaluation of Racial Differences in Seat Belt and Child Restraint Use: A Review of Current Literature*, Ames, Iowa: Center for Transportation Research and Education, Iowa State University, 2004. As of November 26, 2007: http://www.ctre.iastate.edu/reports/seatbelt.pdf

Hamermesh, Daniel S., *Workdays, Workhours, and Work Schedules: Evidence for the United States and Germany*, Kalamazoo, Mich.: W.E. Upjohn Institute for Employment Research, 1996.

Hecht, Michael L., Ronald L. Jackson, and Sidney A. Ribeau, *African American Communication: Exploring Identity and Culture*, 2nd ed., Mahwah, N.J.: L. Erlbaum Associates, 2003.

In re Cincinnati Policing, 214 F.R.D. 221, S.D. Ohio, April 7, 2003. As of October 1, 2007: http://www.cincinnati-oh.gov/police/downloads/police_pdf6369.pdf

Klein, Stephen P., Richard A. Berk, and Laura J. Hickman, *Race and the Decision to Seek the Death Penalty in Federal Cases*, Santa Monica, Calif.: RAND Corporation, TR-389-NIJ, 2006. As of November 26, 2007: http://www.rand.org/pubs/technical_reports/TR389/

Koper, Christopher S., and Evan Mayo-Wilson, "Police Crackdowns on Illegal Gun Carrying: A Systematic Review of Their Impact on Gun Crime," *Journal of Experimental Criminology*, Vol. 2, No. 2, June 2006, pp. 227–261.

Lamberth, John, "Measuring the Racial/Ethnic Make Up of Traffic: The How, What and Why," presentation at "Confronting Racial Profiling in the 21st Century: Implications for Racial Justice," Boston, Mass.: Institute on Race and Justice, March 8–9, 2003.

Lange, James E., Kenneth O. Blackman, and Mark B. Johnson, *Speed Violation Survey of the New Jersey Turnpike: Final Report*, Calverton, Md.: Public Services Research Institute, 2002.

Little, Roderick J. A., and Donald B. Rubin, *Statistical Analysis with Missing Data*, New York: Wiley, 1987.

McCaffrey, Daniel F., Greg Ridgeway, and Andrew R. Morral, "Propensity Score Estimation with Boosted Regression for Evaluating Causal Effects in Observational Studies," *Psychological Methods*, Vol. 9, No. 4, December 2004, pp. 403–425. Reprinted as Daniel F. McCaffrey, Greg Ridgeway, and Andrew R. Morral, *Propensity Score Estimation with Boosted Regression for Evaluating Causal Effects in Observational Studies*, Santa Monica, Calif.: RAND Corporation, RP-1164, 2004. As of November 29, 2007: http://www.rand.org/pubs/reprints/RP1164/

Mehrabian, Albert, "Inference of Attitudes from the Posture, Orientation, and Distance of a Communicator," *Journal of Consulting and Clinical Psychology*, Vol. 32, No. 3, June 1968, pp. 296–308.

Ridgeway, Greg, "Assessing the Effect of Race Bias in Post-Traffic Stop Outcomes Using Propensity Scores," *Journal of Quantitative Criminology*, Vol. 22, No. 1, March 2006, pp. 1–29.

———, *Analysis of Racial Disparities in the New York City Police Department's Stop, Question, and Frisk Practices*, Santa Monica, Calif.: RAND Corporation, TR-534-NYPD, 2007. As of November 29, 2007: http://www.rand.org/pubs/technical_reports/TR534/

Ridgeway, Greg, Terry Schell, K. Jack Riley, Susan Turner, and Travis L. Dixon, *Police-Community Relations in Cincinnati: Year Two Evaluation Report*, Santa Monica, Calif.: RAND Corporation, TR-445-CC, 2006. As of November 26, 2007: http://www.rand.org/pubs/technical_reports/TR445/

Riley, K. Jack, Susan Turner, John MacDonald, Greg Ridgeway, Terry Schell, Jeremy M. Wilson, Travis L. Dixon, Terry Fain, Dionne Barnes-Proby, and Brent D. Fulton, *Police-Community Relations in Cincinnati*, Santa Monica, Calif.: RAND Corporation, TR-333-CC, 2005. As of November 26, 2007: http://www.rand.org/pubs/technical_reports/TR333/

Schlenker, Barry R., and Mark R. Leary, "Social Anxiety and Self-Presentation: A Conceptualization Model," *Psychological Bulletin*, Vol. 92, No. 3, November 1982, pp. 641–669.

Sherman, Lawrence W., "Police Crackdowns: Initial and Residual Deterrence," *Crime and Justice*, Vol. 12, 1990, pp. 1–48

Skogan, Wesley G., and Kathleen Frydl, eds., *Fairness and Effectiveness in Policing: The Evidence*, Washington, D.C.: National Academies Press, 2004.

U.S. Census Bureau, "Cincinnati-Middletown, OH-KY-IN Metropolitan Statistical Area," *ACS Demographic and Housing Estimates: 2006*, Washington, D.C., 2006. As of November 29, 2007: http://factfinder.census.gov/servlet/ADPTable?_bm=y&-qr_name=ACS_2006_EST_G00_DP5&-geo_id=31000US17140&-gc_url=&-ds_name=ACS_2006_EST_G00_&-_lang=en

U.S. Department of Health and Human Services, *Federalwide Assurance (FWA) for the Protection of Human Subjects for Domestic (U.S.) Institutions*, Santa Monica, Calif.: RAND Corporation, FWA00003425, through January 31, 2008.

Word, Carl O., Mark P. Zanna, and Joel Cooper, "The Nonverbal Mediation of Self-Fulfilling Prophecies in Interracial Interaction," *Journal of Experimental Social Psychology*, Vol. 10, No. 2, March 1974, pp. 109–120.