# Racial and Ethnic Disparities in Traffic Stops and Stop Outcomes: Springfield, Missouri

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## Executive Summary

This report summarizes the results of an analysis of racial disparities in stops, searches, arrests, and contraband hits for the city of Springfield, Missouri in 2011.

*Disparities in Stops, Searches, Arrests, and Contraband Hits*

The results suggest that there are substantial race disparities in traffic stops in Springfield. African Americans were disproportionately stopped according to all three of the indicators that were examined (percent of stops, stop rate, and stop disparity).

There also appears to be substantial race disparities in search rates in Springfield. All three indicators suggest that there are substantial disparities in search rates for African Americans, and two out of three indicators suggest there are disparities in search rates for Hispanics.

The data also revealed substantial race disparities in traffic stops that resulted in arrests in the city. All three indicators suggest that traffic stops were more likely to result in arrests for African Americans. Two of the indicators suggest that traffic stops were more likely to result in arrests for Hispanics.

There did not appear to be substantial race/ethnic disparities in contraband hit rates. African Americans had a contraband hit rate that was about equal to the city average, and the contraband hit rate for Hispanics was about substantially *lower* than the city average.

*Disparities in Reasons for Stop and Stop Outcomes*

The data suggest that there are substantial race/ethnic disparities in the reasons given for traffic stops. Specifically, African Americans were substantially overrepresented (and whites were substantially underrepresented) in the percentage of traffic stops that were for investigative reasons. There was not much evidence of substantial race disparities in stop outcomes, in terms of whether there was a citation or a warning issued, or whether there was no action taken.

*Disparities in Probable Cause/Authority to Search*

There were substantial race/ethnic disparities in the reasons given for searches during traffic stops. The data show that the greatest disparities in probable cause/authority to search rates are in the Hispanic population. However, there is also evidence of substantial disparities for whites and blacks as well.

*Disparities in Traffic Stop Arrest Charges*

African Americans were substantially overrepresented in terms of being charged with offense against person, resisting arrest, and traffic violations. Hispanics were overrepresented in terms of their charges for resisting arrest, traffic violations, DWI, and property offense.

*The Socioeconomic and Racial Characteristics of Tracts*

The results suggest that the socioeconomic (measured as average property values in tracts) and racial characteristics (measured as percent of residents who are non-white) of census tracts are related to disparities in African American traffic stops and in African-American stop rates. However, even taking the socioeconomic characteristics of census tracts into account, significant disparities in African-American traffic stops and in African-American traffic stop rates remained.

*Number of Officers Dispatched and Dispatch Rates in Tracts*

The Springfield Police department provided data on the number of officers dispatched in census tracts, which serves as a proxy for police presence and crime rates in census tracts. Officer dispatch rates per 1,000 residents were also calculated for census tracts. The results of the analysis suggest that the number of officers dispatched and the dispatch rates for census tracts were related to disparities in African American stops and in African-American stop rates. However, even taking the number of officers dispatched and dispatch rates of census tracts into account, significant disparities in African-American traffic stops and in African-American traffic stop rates remained.

*Stops Made by the Investigative Division and the Uniformed Officers Bureau*

It was suggested after last year's report that the overall stop rate may not be a reliable indicator of the disparities in African-American traffic stops and in the African-American stop rate, since it takes into account stops made by special units, such as the Gang Task Force, which disproportionately target African-Americans. For the 2011 report, the SPD provided data on whether stops were made by the Investigative Division (which includes the Gang Task Force), and whether stops were made by the Uniformed Operations Bureau. The results of the analysis of this new data shows that disparities in African-American are, in fact, lower once the stops made by the Investigative Division are removed from the overall stop rate. However, significant disparities in African-American stops and in African-American stop rates remained even after taking the stops made by the Investigative Division into account.

## Introduction

This report summarizes the results of an analysis of racial disparities in traffic stops, searches, arrests, and contraband hits for the city of Springfield, Missouri in 2011. The results suggest that there are substantial racial disparities in traffic stops in the city, even after controlling for the racial and socioeconomic status of the census tracts where the stops took place, as well as the number of units dispatched and the dispatch rates for the tracts. While some argue that racial disparities in traffic stops are symptoms of systematic bias, or racial profiling, on the part of the police, it is important to remember that the motivations of individual police officers is incredibly difficult to prove using the type of data examined in this report.

According to Abramosky and Edelstein (p. 730)[1], "a racial profile is an explicit policy, either written or unwritten, of targeting suspects for search and arrest on the basis of race." Racial profiling is a violation of federal law under the 14th Amendment's Equal Protection Clause[2].

Prior research has shown that there are many factors that can account for racial disparities in traffic stops that are not related to racial profiling. Unfortunately, due to the limitations of the empirical data that is available, only a small number of these other possible factors were able to be examined, which makes it difficult to reach a definitive conclusion as to whether or not the Springfield Police Department (SPD) engages in the practice of racial profiling.

However, as more and better data (both quantitative and qualitative) become available in the future, proving or disproving the existence of racial profiling on the part of SPD will become easier. In the meantime, it is recommended that the results summarized in this report be used to continue the dialogue between the SPD and the citizens of Springfield in order to reach a consensus on why substantial racial disparities in traffic stops and stop outcomes exist in the city, and to work with the community on strategies, training, and policies that should be pursued in order to address the disparities.

## A Note on the Data

This report will summarize all of the traffic stop data in the city of Springfield as it pertains to racial disparities for the year 2011.

According to the Missouri Attorney General's website[3]:

"Section 590.650 of Missouri Revised Statutes specifies that every time a peace officer stops a driver for violating a motor vehicle statute or ordinance, that officer must report certain driver information, including the driver's race, to his or her department. The agency then must compile the information from every traffic stop into an annual report to the Attorney General."

This report examines and summarizes the traffic stop data collected by the SPD for its 2011 annual report.

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[1] Abraham Abramovsky and Jonathan I. Edelstein. 2000. "Pretext Stops and Racial Profiling After *Whren v. United States*: The New York and New Jersey Response Compared." *Albany Law Review* Vol. 63(3): 725-742.

[2] For details of the Equal Protection Clause see http://www.law.cornell.edu/wex/Equal_protection

[3] http://ago.mo.gov/racialprofiling/racialprofiling.htm

How is race measured?

In the state of Missouri the race of the driver must be determined and recorded by the police officer making the stop, not by the operator of the vehicle. According to the Missouri Attorney General's website[4], there are two reasons for this:

1. If an officer is profiling based on race, that officer is deciding to pull the driver over based on the officer's perception of that driver's race.
2. If the officer questions the driver about his race, the driver may become confrontational or think his rights are being violated.

Using Census Data as a Benchmark

In order to try to explain the racial disparities in traffic stops in the city of Springfield this analysis takes into account some of the contextual characteristics of the neighborhoods that the stops occur in. For the purposes of this study, census tracts were used to delineate the geographic boundaries of neighborhoods in the city. Specifically, the analysis examines whether the socioeconomic and racial characteristics of the census tracts where a stop occurs is related to racial disparities in traffic stops. Additionally, the SPD provided information on the number of units dispatched per census tract, and whether the stop was made by an officer from the SPD Investigative Division (ID), or the Uniformed Officers Bureau (UOB). This information was used as a proxy to determine whether there was an association between greater police presence in a census tract and race/ethnic disparities in traffic stops, and whether race/ethnic disparities were associated with targeted efforts by the IU and the UOB.

Weakness of Using Census Data as Benchmark:

Census data measures the residential population of a given area. Whether the driving population of the same area shares the demographic profile of the residential population is an important concern. Surveys of transportation and vehicle-ownership rates have suggested that the minority driving population may be significantly different from the minority residential population in a state or locality[5].

In an effort to account for some of the weaknesses in using census data, this report looks only at the segment of the city's population that is 16 years of age and older. However, while this may provide a somewhat more reliable estimate of the driving population for a given area of the city, there are still important two significant weaknesses that must be mentioned:

First, just because someone is over the age of 16 does not necessarily mean that they have a driver's license or a car. Ideally, benchmark data for racial profiling as it relates to traffic stops would take into account the driving population. However, the Missouri Department of Motor Vehicles does not include race when administering driver's licenses, so that information was unavailable for this study.

Second, comparing data on traffic stops to the population of potential licensed drivers in the city does not take into account the differential rates at which minorities and whites travel through

[4] http://ago.mo.gov/racialprofiling/vehiclestopfaqs.htm

[5] Michael R. Smith and Geoffrey P. Alpert. 2002. "Searching for Direction: Courts, Social Science, and the Adjudication of Racial Profiling Claims." *Justice Quarterly* Vol. 19(4): 673-303.

different areas of the city[6]. So, the characteristics of drivers in a given area do not necessarily reflect the characteristics of the residential population in that area.

With these limitations in mind, the results of an analysis of racial disparities in traffic stops in Springfield is examined in detail below.

## Part I: Disparities in Stops, Searches, Arrests, and Contraband Hits

Table 1. City of Springfield 2011 Racial Disparities in Vehicle Stops, Searches, Arrests, and Contraband Hits[7]

| Key Indicators | Total | White | Black | Hispanic | Asian | Am. Indian | Other |
|---|---|---|---|---|---|---|---|
| Population 16+[8] | 133,416 | 120,361 | 5,082 | 4,076 | 2,588 | 1,018 | 4,367 |
| Percent of population 16+ | 100 | 90.21 | 3.81 | 3.06 | 1.94 | 0.76 | 3.27 |
| Stops | 27,518 | 23,974 | 2,513 | 512 | 340 | 31 | 148 |
| Stop percent | 100 | 87.12 | 9.13 | 1.86 | 1.24 | 0.11 | 0.54 |
| Stop rate | 20.63 | 19.92 | 49.45 | 12.56 | 13.14 | 3.05 | 3.39 |
| Stops disparity index | N/A | 0.97 | 2.40 | 0.61 | 0.64 | 0.15 | 0.16 |
| Searches | 3,486 | 2,796 | 576 | 84 | 18 | 2 | 10 |
| Search percent | 100 | 80.21 | 16.52 | 2.41 | 0.52 | 0.06 | 0.29 |
| Search rate | 12.51 | 11.32 | 21.92 | 15.88 | 5.06 | 6.25 | 6.41 |
| Search disparity index | N/A | 0.92 | 1.81 | 1.30 | 0.42 | 0.51 | 0.53 |
| Arrests | 1,922 | 1,546 | 300 | 54 | 15 | 0 | 7 |
| Arrest percent | 100 | 80.44 | 15.61 | 2.81 | 0.78 | 0.00 | 0.36 |
| Arrest rate | 6.90 | 6.26 | 11.42 | 10.21 | 4.21 | 0 | 4.49 |
| Arrest rate disparity index | N/A | 0.92 | 1.71 | 1.51 | 0.63 | 0.00 | 0.68 |
| Contraband | 729 | 587 | 126 | 12 | 3 | 0 | 1 |
| Contraband percent | 100 | 80.52 | 17.28 | 1.65 | 0.41 | 0.00 | 0.14 |
| Contraband hit rate | 20.91 | 20.99 | 21.88 | 14.29 | 16.67 | 0 | 10 |
| Contraband disparity index | N/A | 1.00 | 1.05 | 0.68 | 0.80 | 0.00 | 0.48 |

Table 1 reports the 2011 data on traffic stops, searches, arrests, and contraband hits for the city of Springfield, MO. The data reveal that in 2011:

- The traffic stop rate for African-Americans (49.45 stops for every 100 African-Americans age 16 and over) in Springfield was much higher than the average stop rate for the city (20.63 stops for every 100 people age 16 and over). African-American drivers were nearly 2.5 times more likely to be stopped then would be predicted given their proportion of the Springfield population over 16. All other race/ethnic groups were stopped at rates less than would be predicted given their proportion of the Springfield population.
- Once stopped, African-Americans (21.92 per 100 stops) and Hispanics (15.88 per 100 stops) were searched at rates higher than the city average (12.51 per 100 stops). African-Americans were searched at a rate that is 80% higher than would be predicted given their

[6] Michael R. Smith and Geoffrey P. Alpert. 2002. "Searching for Direction: Courts, Social Science, and the Adjudication of Racial Profiling Claims." *Justice Quarterly* Vol. 19(4): 673-303.

[7] For information on how the statistics in the table were calculated see the Appendix.

[8] Population estimates are based on the 2010 U.S. Census.

proportion of all stops, and Hispanics were searched at a rate that is 30% higher than would be predicted given their proportion of all stops.

- Traffic stop arrest rates were also higher than the city average (6.90 per 100 stops) for African-Americans (11.42 per 100 stops) and Hispanics (10.21 per 100 stops). African-American stops resulted in arrest 71% more of the time than would be predicted based on their proportion of stops, and Hispanic stops resulted in arrest 51% more of the time than would be predicted based on their proportion of stops.
- The contraband hit rate for Hispanics (14.29 per 100 searches) was lower than the average contraband hit rate for the city (20.98 per 100 searches). Searches resulting in contraband hits were 38% lower for Hispanics than would be predicted given their proportion of all searches. The contraband hit rate for African-Americans was very close to the average contraband hit rate for the city.

## Part II: Reason for Stop and Stop Outcome

Table 2. City of Springfield 2011 Racial/Ethnic Disparities in Reasons for Vehicle Stops[9]

| | Vehicle Stop Stats | Total | White | Black | Hispanic | Asian | Am. Indian | Other |
|---|---|---|---|---|---|---|---|---|
| Reason for stop | Moving violation[10] | 12,250 | 10,761 | 947 | 245 | 211 | 15 | 71 |
| | Moving violation percent | 100 | 87.85 | 7.73 | 2.00 | 1.72 | 0.12 | 0.58 |
| | Moving violation rate | 43.15 | 43.58 | 36.04 | 46.31 | 59.27 | 46.88 | 45.51 |
| | Moving disparity index | N/A | 1.01 | 0.85 | 1.08 | 1.39 | 1.09 | 1.08 |
| | Equipment violation[11] | 5,003 | 4,303 | 513 | 104 | 58 | 3 | 22 |
| | Moving violation percent | 100 | 86.01 | 10.25 | 2.08 | 1.16 | 0.06 | 0.44 |
| | Equipment violation rate | 17.62 | 17.43 | 19.52 | 19.66 | 16.29 | 9.38 | 14.10 |
| | Disparity equipment | N/A | 0.99 | 1.12 | 1.12 | 0.94 | 0.53 | 0.82 |
| | License violation[12] | 10,236 | 8,925 | 1,007 | 153 | 79 | 12 | 60 |
| | License violation percent | 100 | 87.19 | 9.32 | 1.49 | 0.77 | 0.12 | 0.59 |
| | License violation rate | 36.05 | 36.15 | 38.32 | 28.92 | 22.19 | 37.5 | 38.46 |
| | License disparity index | N/A | 1.00 | 1.08 | 0.80 | 0.63 | 1.04 | 1.09 |
| | Investigative stops[13] | 902 | 701 | 161 | 27 | 8 | 2 | 3 |
| | Investigative stop percent | 100 | 77.72 | 17.85 | 2.99 | 0.89 | 0.22 | 0.33 |
| | Investigative stop rate | 3.18 | 2.84 | 6.13 | 6.82 | 2.25 | 6.25 | 1.92 |
| | Investigative disparity index | N/A | 0.89 | 1.95 | 1.61 | 0.72 | 1.97 | 0.62 |

[9] For information on how the statistics in the table were calculated see the Appendix.

[10] **Moving violations --** driving the wrong way on a one way street, speeding, any type of stop sign or signal violation, failing to yield to emergency vehicle, failing to stop for a school bus, driving on the sidewalk, passing violation, careless and imprudent driving, etc.

[11] **Equipment violations** – headlight violations, taillight violations, motorcycle driver with no helmet, obstructed view, etc.

[12] **License violations** – a vehicle displaying no license plate, license plates that don't check to that vehicle, license plates that don't display a current annual registration tab, license plates displayed incorrectly, etc.

[13] **Investigative stops** – stops related to a crime where an officer has reason to believe the vehicle or driver was involved in a crime, stops where an officer has reason to believe the driver has no driver's license (personal knowledge or an MDT check while moving), stops where an officer has reason to believe the driver or occupants have a warrant (personal knowledge or an MDT check on the plate while moving), etc.

Table 2 reports the data on reasons for traffic stops in 2011. The data reveal that:

- The moving violation rate for African-Americans (36.04 per 100 stops) was lower than the citywide average (43.15 per 100 stops). African-Americans were 15% less likely to be stopped for moving violations than would be predicted given their proportion of all stops. The moving violation rate for Asians (59.27 per 100 stops) was higher than the citywide average. For Asians, the proportion of stops due to moving violations was 39% higher than would be predicted given their overall proportion of stops.
- African-Americans (19.52 per 100 stops) and Hispanics (19.66 per 100 stops) were stopped for equipment violations at rates that were somewhat higher than the citywide average (17.62 per 100 stops). Both groups were 12% more likely to be stopped for equipment violations than would be predicted given their overall proportion of stops.
- Hispanics (28.92 per 100 stops) and Asians (22.19) were stopped due to license violations at rates that were lower than the citywide average (36.05 per 100).
- African-Americans (6.13 per 100 stops) and Hispanics (6.82 per 100 stops) were stopped for investigative reasons at rates that were nearly double the citywide average (3.18 per 100). African-Americans were stopped for investigative reasons at a rate that was 95% higher than would be predicted given their proportion of all traffic stops, and Hispanics were stopped for investigative reasons at a rate that was 61% higher than would be predicted given their proportion of all traffic stops.

## Part III: Probable Cause/Authority to Search

Table 3. City of Springfield 2011 Racial Ethnic Disparities in Vehicle Stop Outcomes[14]

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Stop outcome | Citation | 11,821 | 10,406 | 983 | 225 | 143 | 15 | 49 |
| | Citation percent | 100 | 88.03 | 8.32 | 1.90 | 1.21 | 0.13 | 0.42 |
| | Citation rate | 41.64 | 42.15 | 37.40 | 42.53 | 40.17 | 46.88 | 31.41 |
| | Citation disparity index | N/A | 1.01 | 0.91 | 1.02 | 0.98 | 1.13 | 0.77 |
| | Warning | 12,195 | 10,612 | 1,120 | 220 | 159 | 12 | 72 |
| | Warning percent | 100 | 87.02 | 9.18 | 1.80 | 1.30 | 0.10 | 0.59 |
| | Warning rate | 46.15 | 42.98 | 42.62 | 41.59 | 44.66 | 37.50 | 46.15 |
| | Warning disparity index | N/A | 1.00 | 1.01 | 0.97 | 1.06 | 0.87 | 1.10 |
| | No action | 3,978 | 3,386 | 440 | 73 | 45 | 4 | 30 |
| | No action percent | 100 | 85.12 | 11.06 | 1.84 | 1.13 | 0.10 | 0.75 |
| | No action rate | 14.01 | 13.71 | 16.74 | 13.80 | 12.64 | 12.5 | 19.23 |
| | No action disparity index | N/A | 0.98 | 1.21 | 0.98 | 0.92 | 0.89 | 1.40 |

Table 3 reports the data on 2011 vehicle stop outcomes. According to Table 3:

- There were not substantial disparities in stops resulting in citations. The rate of traffic stops resulting in a citation was slightly lower for African-American drivers (37.40 per 100 stops) than the citywide average (41.64 per 100 stops). Traffic stops resulting in citations for African-American drivers were 9% lower than would have been predicted given their proportion of all stops.

[14] For information on how the statistics in the table were calculated see the Appendix.

- There were not substantial disparities in vehicle stops resulting in warnings by race or ethnicity in 2011. All groups were issued warnings at rates similar to the citywide average (46.15 per 100 stops).
- Traffic stops were somewhat more likely to result in no action for African-American drivers (16.74 per 100 stops) than the citywide average (14.01 per 100 stops). Vehicle stops of African-American drivers resulted in no action at a rate that was 21% higher than would be predicted given their proportion of all stops.

## Part IV: Disparities in Traffic Stop Arrest Charges

Table 4. City of Springfield 2011 Racial/Ethnic Disparities in Probable Cause for Vehicle Searches[15]

| | Search Stats | Total | White | Black | Hispanic | Asian | Am. Indian | Other |
|---|---|---|---|---|---|---|---|---|
| Probable cause/authority to search | Consent | 2,303 | 1,846 | 391 | 54 | 5 | 2 | 5 |
| | Consent percent | 100 | 80.16 | 16.98 | 2.34 | 2.17 | 0.09 | 0.22 |
| | Consent rate | 66.06 | 66.02 | 67.88 | 64.29 | 27.78 | 100 | 50.00 |
| | Consent disparity index | N/A | 1.00 | 1.03 | 0.97 | 0.42 | 1.51 | 0.76 |
| | Inventory | 142 | 112 | 25 | 3 | 2 | 0 | 0 |
| | Inventory percent | 100 | 78.87 | 17.61 | 2.11 | 1.41 | 0 | 0 |
| | Inventory rate | 4.07 | 4.01 | 4.34 | 3.57 | 11.11 | 0 | 0 |
| | Inventory disparity index | N/A | 0.98 | 1.07 | 0.88 | 2.73 | 0 | 0 |
| | Drug/alcohol odor | 325 | 243 | 70 | 8 | 3 | 0 | 1 |
| | Drug/alcohol odor percent | 100 | 74.77 | 21.54 | 2.46 | 0.92 | 0.00 | 0.31 |
| | Drug/alcohol odor rate | 9.32 | 8.69 | 12.15 | 9.52 | 16.67 | 0.00 | 10.00 |
| | Drug/alcohol disparity index | N/A | 0.93 | 1.30 | 1.02 | 1.79 | 0.00 | 1.07 |
| | Incident to arrest | 1,054 | 859 | 151 | 31 | 10 | 0 | 5 |
| | Incident to arrest percent | 100 | 81.50 | 14.33 | 2.75 | 0.95 | 0 | 0.47 |
| | Incident to arrest rate | 30.23 | 30.72 | 26.22 | 34.52 | 55.56 | 0 | 50.00 |
| | Incident to arrest disparity index | N/A | 1.02 | 0.87 | 1.14 | 1.84 | 0 | 1.65 |
| | Plain view contraband | 146 | 117 | 23 | 4 | 2 | 0 | 0 |
| | Plain view contraband percent | 100 | 80.14 | 15.75 | 2.74 | 1.37 | 0 | 0 |
| | Plain view contraband rate | 4.19 | 4.18 | 3.99 | 4.76 | 11.11 | 0 | 0 |
| | Contraband disparity index | N/A | 1.00 | 0.95 | 1.14 | 2.65 | 0 | 0 |
| | Reasonable suspicion—weapon | 91 | 61 | 28 | 2 | 0 | 0 | 0 |
| | Reasonable suspicion—weapon percent | 100 | 67.03 | 30.77 | 2.20 | 0 | 0 | 0 |
| | Reasonable suspicion—weapon rate | 2.61 | 2.18 | 4.86 | 2.38 | 0 | 0 | 0 |
| | Reasonable suspicion disparity index | N/A | 0.84 | 1.86 | 0.91 | 0 | 0 | 0 |
| | Drug-dog alert | 15 | 11 | 4 | 0 | 0 | 0 | 0 |
| | Drug-dog alert percent | 100 | 73.33 | 26.67 | 0 | 0 | 0 | 0 |
| | Drug-dog alert rate | 0.43 | 0.39 | 0.69 | 0 | 0 | 0 | 0 |
| | Drug-dog disparity index | N/A | 0.91 | 1.61 | 0 | 0 | 0 | 0 |
| | Other | 73 | 61 | 11 | 0 | 1 | 0 | 0 |
| | Other reason percent | 100 | 83.56 | 15.07 | 0 | 1.37 | 0 | 0 |
| | Other reason rate | 2.09 | 2.18 | 1.91 | 0 | 5.56 | 0 | 0 |
| | Other disparity index | N/A | 1.04 | 0.92 | 0 | 2.65 | 0 | 0 |

[15] For information on how the statistics in the table were calculated see the Appendix.

Table 4 reports the 2011 data on vehicle searches. According to the data:

- There were not substantial race/ethnic disparities in searches where consent was given. All race/ethnic groups were close to the citywide average for consent (66.06 per 100 searches).
- African-American search rates as the result of drug/alcohol odor (12.15 per 100 searches) were higher than the citywide average (9.32 per 100 searches). African-American drivers were searched due to drug/alcohol odor at a rate that was 30% higher than would have been predicted given their proportion of all searches.
- African-American drivers were searched due to an incident to arrest at a rate (26.22 per 100 searches) that was lower than the citywide average (30.23 per 100 searches). The incident to arrest rate for African-Americans was 13% lower than would have been predicted given their proportion of all searches. Hispanic drivers were searched due to an incident to arrest at a rate (34.52 per 100 searches) that was higher than the citywide average. Hispanics had an incident to arrest rate that was 14% higher than would have been predicted given their overall proportion of searches.
- African-Americans were searched due to reasonable suspicion of a weapon at a rate (4.86 per 100 searches) that was higher than the citywide average (2.61 per 100 searches). African-Americans were 85% more likely to be searched than would have been expected given their overall proportion of searches.

## Part V: The Characteristics of Tracts and Disparities in African-American Traffic Stops

Table 5. Racial Demographics, Average Property Values, and Number of Officers Dispatched for Census Tracts (N=51)

| | Minimum | Maximum | Average |
|---|---|---|---|
| Percent Nonwhite | 3% | 17% | 7% |
| Avg. Property Value[16] | $15,142 | $507,778 | $114,037 |
| Avg. Residential Property Value[17] | $9,573 | $645,572 | $123,384 |
| N Dispatched | 67 | 4,435 | 1,501 |
| Dispatch Rate[18] | 11.79 | 271.76 | 57.49 |

Table 5 reports descriptive statistics for the racial and socioeconomic characteristics of Springfield's census tracts, as well as the number of units dispatched and the dispatch rate for census tracts in 2011.

[16] Average property value was calculated as the 2010 U.S. Census mean value of all property in a tract, including single-family and multi-family residences, commercial property, industrial property, agricultural property, community property, and parks property.

[17] Average residential property value was calculated as the 2010 U.S. Census mean value of all single-family and multi-family residences.

[18] Dispatch rate = (number dispatched/ tract population) * 100

Table 6. Pearson's *r* Correlation Coefficients for Tract Characteristics[19]

| | Percent Nonwhite | Avg. Property Value | Avg. Residential Property Value | N Dispatched | Dispatch Rate |
|---|---|---|---|---|---|
| Percent Nonwhite | 1.00 | -0.22 | -0.14 | 0.53 | 0.12 |
| Avg. Property Value | | 1.00 | 0.58 | -0.21 | 0.03 |
| Avg. Residential Property Value | | | 1.00 | -0.29 | 0.31 |
| N Dispatched | | | | 1.00 | 0.21 |
| Dispatch Rate | | | | | 1.00 |

Table 6 reports the Pearson's *r* correlations for the racial, socioeconomic, and crime characteristics of census tracts in the city. The table shows that:

- There is a weak, negative association between the percent of the population that is nonwhite and property values across census tracts.
- There is a moderate, positive association between the percent of the population that is nonwhite and the number of officers dispatched across census tracts.
- There is a weak, positive association between the percentage of the population that is nonwhite and the dispatch rate per 100 residents across census tracts.
- There is a weak, negative association between average property values and the number of officers dispatched across census tracts.
- There is a moderate, positive association between average residential property values and the overall average of property values across census tracts.
- There is a moderate, positive association between average residential property values and dispatch rates across census tracts.

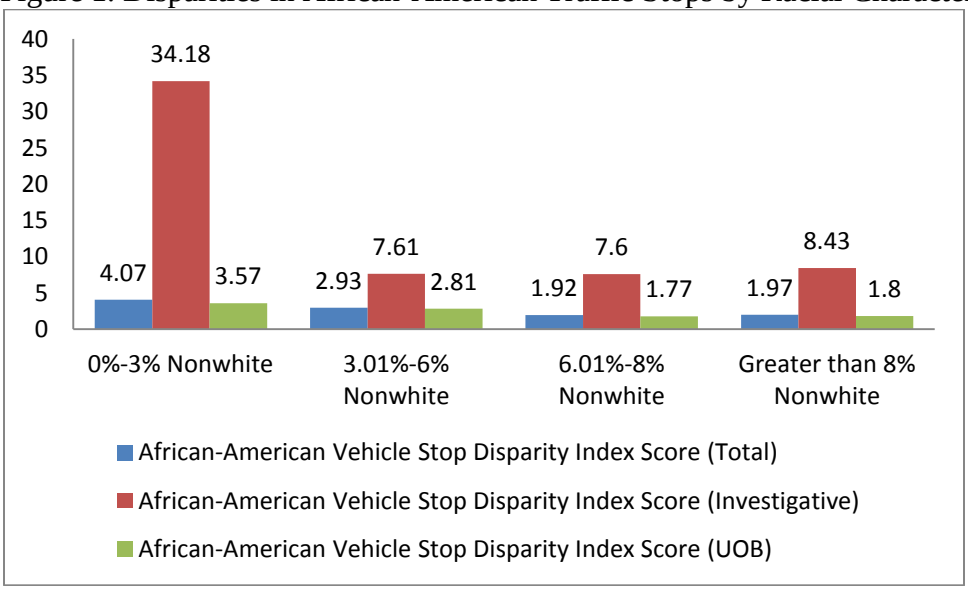
Table 7. Census Tract-Level Descriptive Statistics for African-American Disparity Index Scores and Stop Rates For Overall Stops, Stops Made by Investigative Division, and Stops Made by the Uniformed Operations Bureau (UOB)

| | N | Mean | Median | Minimum | Maximum |
|---|---|---|---|---|---|
| Black Disparity | 50 | 2.71 | 2.19 | 0 | 12.45 |
| Black Disparity (ID) | 44 | 13.27 | 7.90 | 0 | 115.68 |
| Black Disparity (UOB) | 50 | 2.48 | 2.03 | 0 | 9.96 |
| Black Stop Rate | 50 | 55.03 | 39.01 | 0 | 312.50 |
| Black Stop Rate (ID) | 50 | 5.35 | 3.56 | 0 | 37.50 |
| Black Stop Rate (UOB) | 50 | 49.67 | 36.74 | 0 | 275.00 |

[19] Pearson's *r* reports the strength and direction of the association between two variables. Values of Parson's *r* range from -1.0 to +1.0. Values that are closer to ±1 indicate stronger associations than values closer to 0.0. Negative values indicate that as scores on one variable increase, scores on the other decrease. Positive values indicate that as scores on one variable increase, scores on the other also increase. As a general rule, values between 0.0 and 0.3 (absolute value) indicate a weak association, values between 0.31 and 0.6 indicate a moderate association, and values between 0.61 and 1.0 indicate a strong association between variables.

- Table 7 reports census tract-level descriptive statistics for African-American disparity index scores and stop rates. The data are reported for the overall number of African-American stops, and for stops made by the ID and the UOB.
- The data are significantly skewed for African-American disparity index scores and stop rates. The median is a more accurate measure of central tendency, since there are a few outlier tracts where African-Americans make up a very small proportion of the population relative to their proportion of stops. For example, in the tract with the highest African-American disparity index score, tract 45, there were only 12 stops in 2011. Of the 12 motor vehicles that were stopped, three (25%) were operated by African-American drivers. The tract has a total population of 1,245. Of that 1,245, only 25 are African-American (~2%). So, it appears there is a large disparity in that tract, even though a very small number of African-American drivers were actually stopped.
- Overall, the median disparity index score for African-Americans was 2.19. The median African-American disparity index score for stops made by the investigative division (7.90) was much higher than the overall African-American disparity index score (2.19). The median African-American disparity index score was somewhat lower for stops made by UOB (2.03), compared to the overall African-American median disparity index score.
- Overall, the median African-American stop rate was 39.01 per 100 people. The median black stop rate for stops made by the investigative unit was much lower than the overall rate at 3.56 per 100 people. The median black stop rate for stops made by the UOB (36.74 per 100 people) was very close to the overall median black stop rate.

Figure 1. Disparities in African-American Traffic Stops by Racial Characteristics of Tract

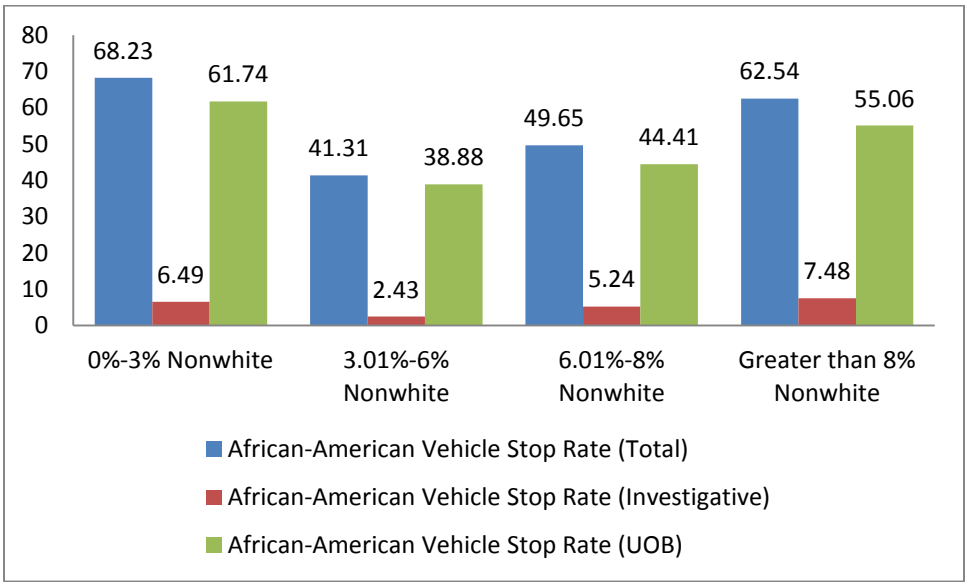



- Figure 1 shows that, overall, disparities in the proportion of African-American vehicle stops are twice as high in the least diverse census tracts, compared to the most diverse census tracts. Some of the disparity in African-American vehicle stops can be explained by the racial characteristics of the tract. However, Figure 1 shows that even in the most

diverse census tracts African-Americans are still stopped at rates that are much higher than would be expected, given their proportion of the tract population.

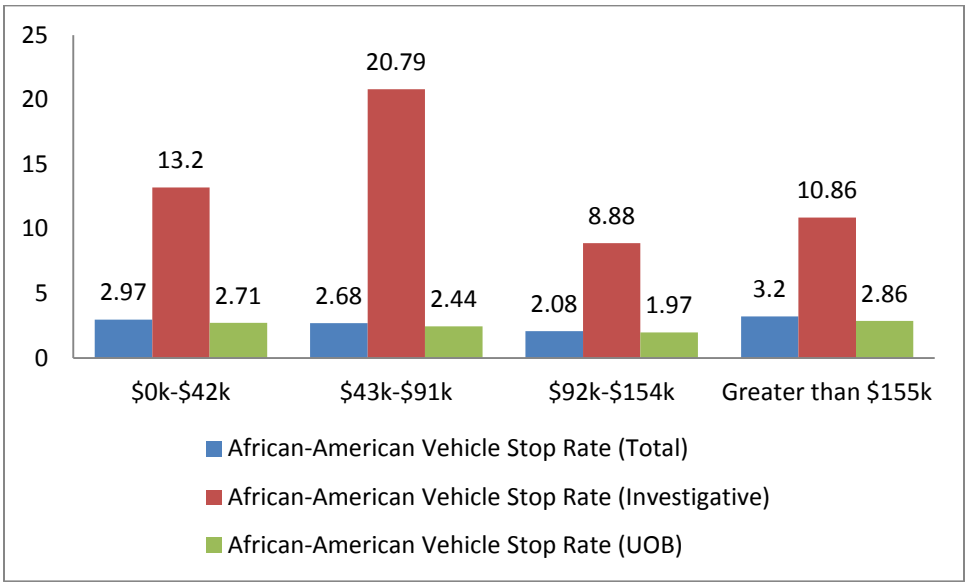
- In terms of investigative stops, disparities were large for all tracts, but the largest disparities were in the least diverse tracts.
- Separating the UOB stops from the investigative stops lowered the disparities in each tract somewhat, but not enough to fully explain the disproportionate number of stops for African-Americans in Springfield's census tracts.

Figure 2. Differences in African-American Vehicle Stop Rates by Racial Characteristics of Census Tracts



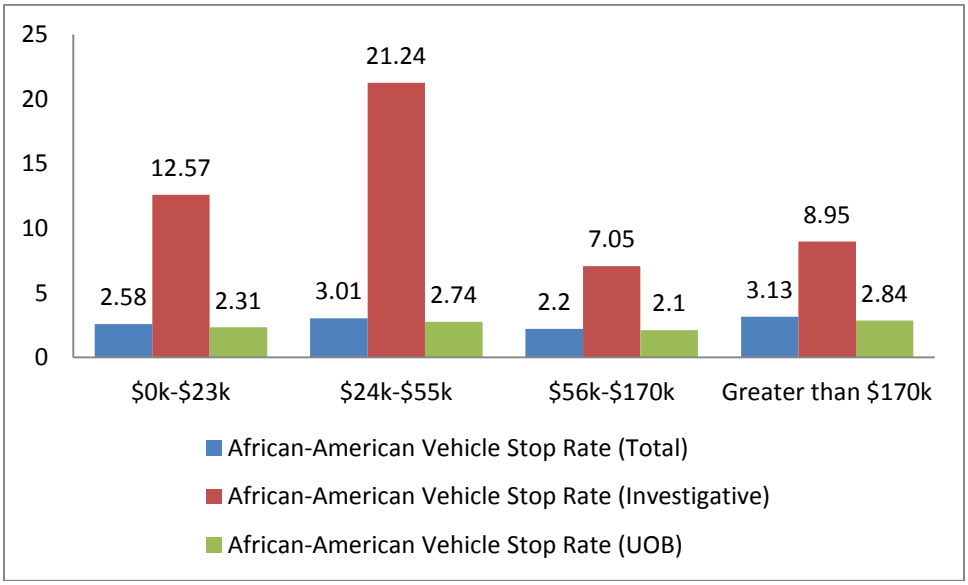

- According to Figure 2, overall, there appears to be a curvilinear relationship between African-American vehicle stop rates and tract diversity. The rate is 68.23 per 100 people in tracts that are less than 3% nonwhite, 41.31 per 100 people in tracts between 3% and 6% nonwhite, 49.65 per 100 people in tracts that are between 6% and 8% nonwhite, and 62.54 per 100 people in tracts greater than 8% nonwhite. So, African-American stop rates are highest in the city's most diverse and least diverse tracts, and they are lowest in the city's moderately diverse tracts.
- African-American investigative stop rates were much lower than overall stop rates and UOB stop rates, but they also show a curvilinear relationship.
- Separating the UOB stop rates from the investigative stop rates results in somewhat lower rates then when investigative stops are included.

Figure 3. Disparities in African-American Traffic Stops by Average Property Values within Tracts



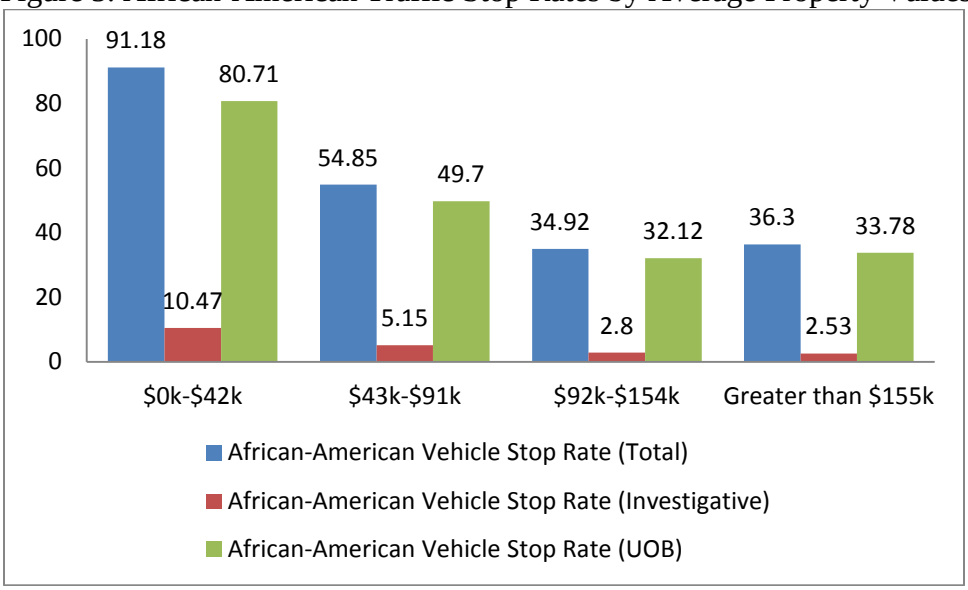

- Figure 3 shows that in terms of overall stop rates, there is a weak curvilinear association between disparities in African-American vehicle stops and average property values within tracts. Disparities were highest in the tracts with the highest and lowest average property values, and they were lowest in tracts in the middle.
- Disparities in investigative stops were highest in the tracts with the lowest average property values, and lowest in the tracts with the highest average property values.
- The UOB stop disparities were somewhat lower than the overall stop disparities for all tracts.

Figure 4. Disparities in African-American Traffic Stops by Average Residential Property Values within Tracts



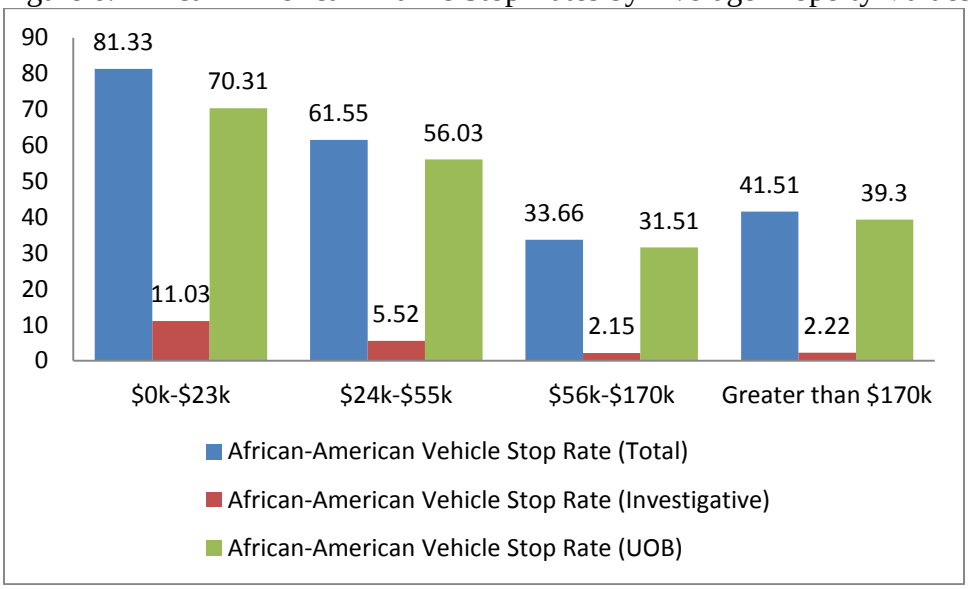
- According to Figure 4, patterns in African-American vehicle stop disparities by residential property values were similar to the disparities when all types of property values were included.

Figure 5. African-American Traffic Stop Rates by Average Property Values within Tracts



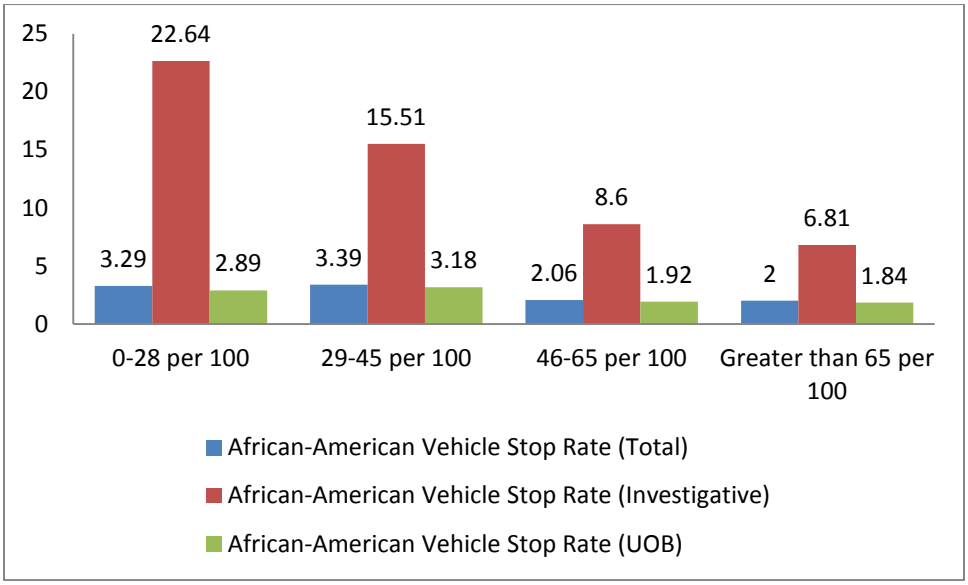

- Figure 5 shows a negative association between African-American vehicle stop rates and average property values in census tracts. In the tracts with the lowest property values, the African-American stop rate was 91.18 per 100 people, while in the tracts with the highest property values, the African-American stop rate was 36.3 per 100 people.

Figure 6. African-American Traffic Stop Rates by Average Property Values within Tracts



- Figure 6 shows that patterns in African-American vehicle stop rates by residential property values were similar to the disparities when all types of property values were included.

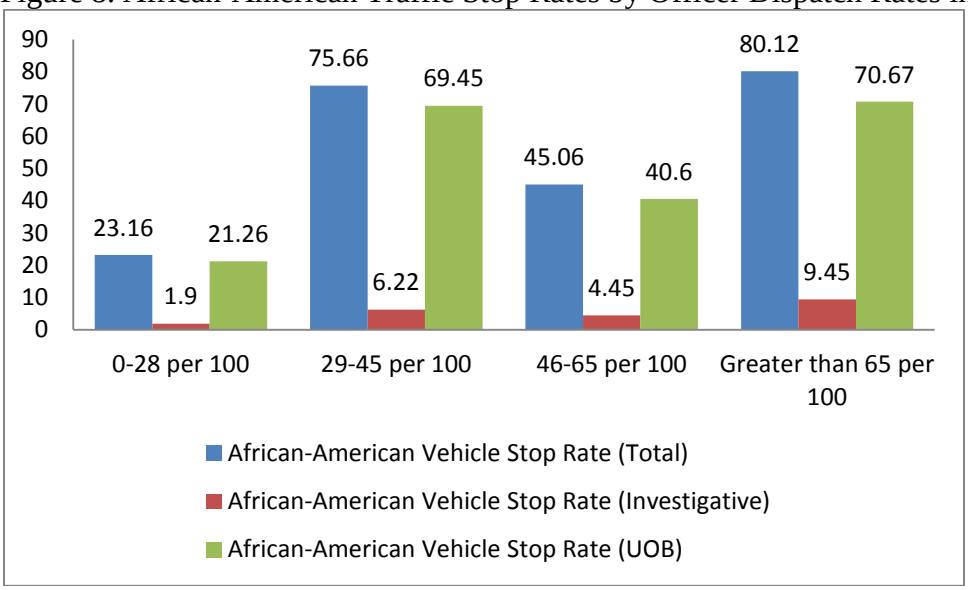
Figure 7. Disparities in African-American Traffic Stops by Officer Dispatch Rates in Census Tracts[20]




- Figure 7 reports the average African-American traffic stop disparity index score for all stops, and for stops made by the investigative unit and the UOB by officer dispatch rates per 100 people in census tracts.
- Average disparity index scores are similar for overall stops and for stops made by the UOB. For both, disparity rates are lower in high-dispatch rate tracts than in low-dispatch rate tracts.
- Average disparity index scores are much higher for stops made by the investigative unit than the scores for overall stops and stops by the UOB. The average disparity index score for investigative stops is highest for the low-dispatch rate tracts and lowest for the high-dispatch rate tracts.
- Despite the fact that the disparity index scores for stops made by the UOB are substantially lower than those for the investigative division, African-Americans are still stopped by the UOB at a rate that is disproportionate to their share of the tract population.

[20] Officer dispatch rates were calculated per 100 people and do not include motor vehicle related dispatches.

Figure 8. African-American Traffic Stop Rates by Officer Dispatch Rates in Census Tracts




- Figure 8 reports African-American traffic stop rates for all stops, stops made by the investigative unit, and stops made by the UOB, by officer dispatch rates in census tracts.
- For all three types of stops, the African-American stop rates are much lower in low-dispatch rate tracts than in high-dispatch rate tracts.
- African-American stop rates for stops made by the investigative unit are much lower than the overall stop rate and the UOB stop rate.

## Part VI Conclusion

The results summarized in this report reveal significant racial disparities in traffic stops, searches, arrests, and contraband hit rates in the city of Springfield. The results also show that while the socioeconomic and racial characteristics of census tracts, the number and rate of officers dispatched in census tracts, and whether a stop was made by the ID or the UOB, account for some of the racial disparities in traffic stops, a significant proportion of the disparities remain unexplained. Future studies should attempt to account for other factors that may influence racial disparities in traffic stops.

For example, some possible factors that contribute to the race/ethnic disparities in traffic stops might be the actual crime rates of the tracts where the stops occurred, poverty rates within the tract, whether the stop occurred in an area with high levels of gang activity, and the racial characteristics of drivers.

It is strongly recommended that the results summarized in the report be used to continue the dialogue between the SPD and citizens of Springfield, in order to determine the causes of the racial disparities in traffic stops and to develop an open and collaborative process for developing a strategy to close the gap. While some people may be tempted to cite the results summarized in this report as evidence that Springfield has a problem with racial profiling, it is important to keep in mind that there is currently not enough data available to be able to definitively determine the cause of the disparities that were summarized in this report. Racial profiling is notoriously

difficult to prove in a court of law and better data is needed in order to rule out all competing explanations for the trends that were described in the report.

## Appendix

Below is detailed information on the formulas that were used to calculate the statistics presented in Tables 1 through 4 in the report.

**Table 1**

**Percent stops** = (number of stops/total number of stops) * 100
**Percent searches** = (number of searches/total number of searches) * 100
**Percent contraband hit** = (number of contraband hits/total number of contraband hits) * 100
**Percent arrest** = (number of arrests/total number of arrests) * 100
**Stops disparity index** = (proportion of stops / proportion of population ). A value of 1 represents no disparity; values greater than 1 indicate over-representation, values less than 1 indicate under-representation.
**Searches disparity index = (**proportion of searches/proportion of stops).
**Contraband disparity index** = (proportion of contraband hits / proportion of searches). A value of 1 represents no disparity; values greater than 1 indicate over-representation, values less than 1 indicate under-representation.
**Arrest rate disparity index** = (proportion of arrests / proportion of stops). A value of 1 represents no disparity; values greater than 1 indicate over-representation, values less than 1 indicate under-representation.
**Stop rate** = (stops/population 16+) X 100.
**Search rate** = (searches / stops) X 100.
**Arrest rate** = (arrests / stops) X 100.
**Contraband hit rate** = (searches with contraband found / total searches) X 100.

**Table 2**

**Percent moving violations** = (number of moving violations/ total number of moving violations) *100
**Percent equipment violations** = (number of equipment violations/ total number of equipment violations) * 100
**Percent license violations** = (number of license violations/ total number of license violations) * 100
**Percent investigative** = (number of investigative/ total number of investigative) *100
**Moving disparity index** = (proportion of moving violations / proportion of stops). A value of 1 represents no disparity; values greater than 1 indicate over-representation, values less than 1 indicate under-representation.
**Equipment disparity index** = (proportion of equipment violations / proportion of stops). A value of 1 represents no disparity; values greater than 1 indicate over-representation, values less than 1 indicate under-representation.
**License disparity index** = (proportion of license violations / proportion of stops). A value of 1 represents no disparity; values greater than 1 indicate over-representation, values less than 1 indicate under-representation.
**Investigative disparity index** = (proportion of investigative stops / proportion of stops). A value of 1 represents no disparity; values greater than 1 indicate over-representation, values less than 1 indicate under-representation.
**Moving rate** = (number of moving violations/ number of stops) *100
**Equipment rate** = (number of equipment violations/ number of stops) * 100

**License rate** = (number of license violations/ number of stops) * 100
**Investigative rate** = (number of investigative stops/ number of stops) * 100

**Table 3**
**Percent citation** = (number of citations/ total number of citations) * 100
**Percent warning** = (number of warnings/ total number of warnings) * 100
**Percent no action** = (number no action/ total number no action) *100
**Citation disparity index** = (proportion of citations / proportion of stops). A value of 1 represents no disparity; values greater than 1 indicate over-representation, values less than 1 indicate under-representation.
**Warning disparity index** = (proportion of warnings / proportion of stops). A value of 1 represents no disparity; values greater than 1 indicate over-representation, values less than 1 indicate under-representation.
**No action disparity index** = (proportion of no action / proportion of stops). A value of 1 represents no disparity; values greater than 1 indicate over-representation, values less than 1 indicate under-representation.
**Citation rate** = (number of citations/ number of stops) *100
**Warning rate** = (number of warnings/ number of stops) *100
**No action rate** = (number no action/ number of stops) * 100

**Table 4**
**Percent consent** = (number consent/ total number consent) *100
**Percent inventory** = (number inventory/ total number inventory) * 100
**Percent drug/alcohol** = (number drug or alcohol/ total number drug or alcohol) * 100
**Percent incident to arrest** = (number incident to arrest/ total number incident to arrest) * 100
**Percent contraband** = (number contraband/ total number contraband) * 100
**Percent reasonable suspicion** = (number reasonable suspicion/ total number reasonable suspicion) * 100
**Percent drug dog** = (number drug dog/ total number drug dog) * 100
**Percent other** = (number other/ total number other) * 100
**Consent disparity index** = (proportion giving consent to be searched / proportion of searches). A value of 1 represents no disparity; values greater than 1 indicate over-representation, values less than 1 indicate under-representation.
**Inventory disparity index** = (proportion inventory/ proportion of searches). A value of 1 represents no disparity; values greater than 1 indicate over-representation, values less than 1 indicate under-representation.
**Drug/alcohol disparity index** = (proportion drug/alcohol odor / proportion of searches). A value of 1 represents no disparity; values greater than 1 indicate over-representation, values less than 1 indicate under-representation.
**Incident to arrest disparity index** = (proportion incident to arrest / proportion of searches). A value of 1 represents no disparity; values greater than 1 indicate over-representation, values less than 1 indicate under-representation.
**Contraband disparity index** = (proportion of plain view contraband / proportion of searches). A value of 1 represents no disparity; values greater than 1 indicate over-representation, values less than 1 indicate under-representation.

**Reasonable suspicion disparity index** = (proportion reasonable suspicion of weapon / proportion of searches). A value of 1 represents no disparity; values greater than 1 indicate over-representation, values less than 1 indicate under-representation.
**Drug-dog disparity index** = (proportion drug-dog alert / proportion of searches). A value of 1 represents no disparity; values greater than 1 indicate over-representation, values less than 1 indicate under-representation.
**Other disparity index** = (proportion other reason for search / proportion of searches). A value of 1 represents no disparity; values greater than 1 indicate over-representation, values less than 1 indicate under-representation.
**Consent rate** = (number consent/ number searches) * 100
**Inventory rate** = (number inventory/ number searches) * 100
**Drug/alcohol rate** = (number drug or alcohol odor/ number of searches) * 100
**Incident to arrest rate** = (number incident to arrest/ number of searches) *100
**Contraband rate** = (number contraband/ number of searches) * 100
**Reasonable suspicion rate** = (number reasonable suspicion/ number of searches) * 100
**Drug-dog rate** = (number drug dog/ number of searches) * 100
**Other rate** = (number other/ number of searches) *100