Iowa City Police Traffic Study
Brief Summary

Prepared by:
Chris Barnum

St. Ambrose University

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For several years now, the City of Iowa City has partnered with St. Ambrose University to develop and implement an analysis of the Iowa City Police Department's traffic stop activity. The current investigation focuses on evaluating stops made by the ICPD between January 1st, 2016 and December 31st 2017. These analyses center on evaluating two broad categories of discretionary police conduct: *(i)* racial disparity in vehicle stops—instantiated as racial differences in the likelihood of being stopped by the ICPD and *(ii)* dissimilarities across racial demographics in the outcome or disposition of a stop.

To evaluate the racial demographics of stops, our research team utilized driver-population *benchmarks* fashioned from roadside observations and census data. A benchmark should be thought of as the proportion of minority drivers on the roads in a given location. In plain terms, the benchmark is a standard that can be used to judge the percentage of minority drivers that should be stopped by the police when no bias is occurring. In Iowa City, the population characteristics of the city was divided up into one-square-mile units called *observation zones*' (see figure one below).

Figure 1

Once the boundaries of the observation zones were determined, roadside surveyors were deployed to monitored traffic at several locales within selected zones. The observers watched traffic at various times of the day ranging from 7:00 am until 2:00 am. To date, observers have logged more than 65,000 observations from locations across the city. Results show a high degree of inter-rater consistency between observers across all zones. The observational benchmarks are currently being updated with additional observations in several zones.

The process of comparing police data to benchmarks is straight forward. It centers on identifying differences between the demographic percentages from ICPD traffic stop data and benchmark information. Any positive difference between benchmark values and police data signifies ***disproportionality*** or an over representation of minority drivers in the data. Although, disproportionality can indicate bias or discrimination, it does not necessarily do so. It is possible for disproportionality to occur for a number of legitimate reasons, including differences between racial groups in driving behavior, vehicle condition, drivers' license status and so forth.

Our methodology makes it possible to track disproportionality by area, by time of day, by duty assignment and by individual officer. While this method serves as a useful tool in assessing disproportionality, please keep in mind that the method is only an *estimate* of disproportionality in police activity, not a certainty. This stems from the fact that the analyses are predicated on differences between stops and benchmarks, and that benchmarks are formed from *samples* of the drivers on the roads in a given area and time. Consequently, like any sample, a benchmark may be associated with a degree of sampling error.

2016 Analyses

Figures 2 and 3 below give the number of **2016** ICPD traffic stops by observation zone for days and nights. The information indicates that for each time frame, most ICPD traffic stops were made in the downtown area (zone 21) followed by the Broadway-Wetherby areas (zone 29).

Figure 2

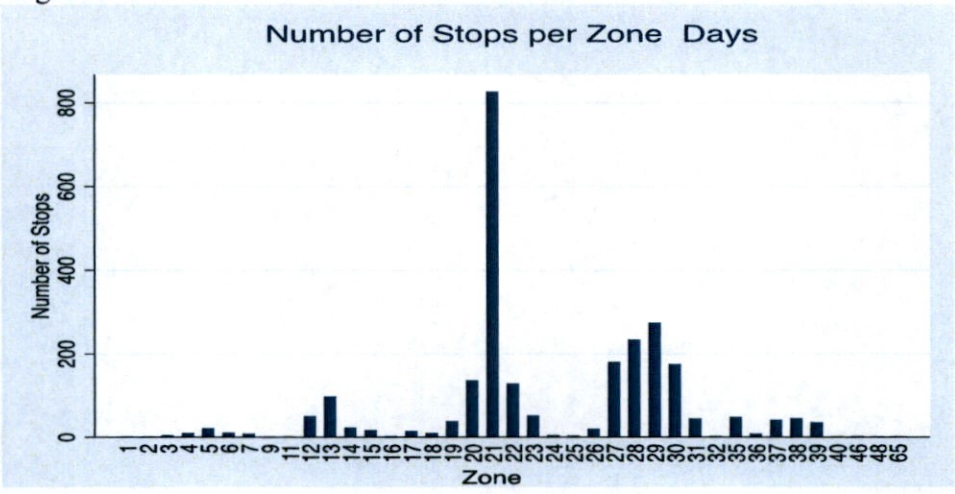
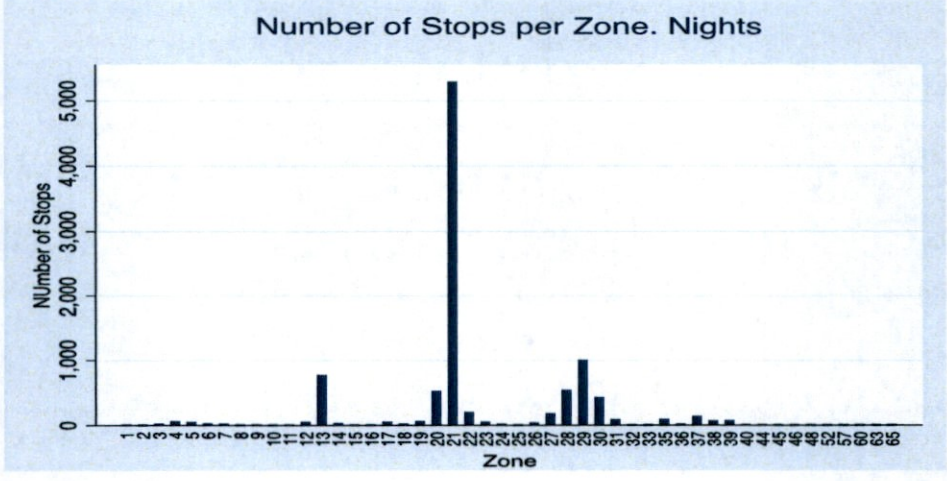


Figure 3



Figures 4 and 5 below give the percentage of minority drivers stopped and corresponding benchmark values for observation zones for both days and nights. In the figures below, any positive difference between the percentage of minority drivers stopped and benchmark values signifies *disproportionality*. In general, the information suggests that levels of disproportionality tended to be lowest in areas where the most stops were made and the highest levels of disproportionality were found in locations where relatively few stops were made.

Figure 4.

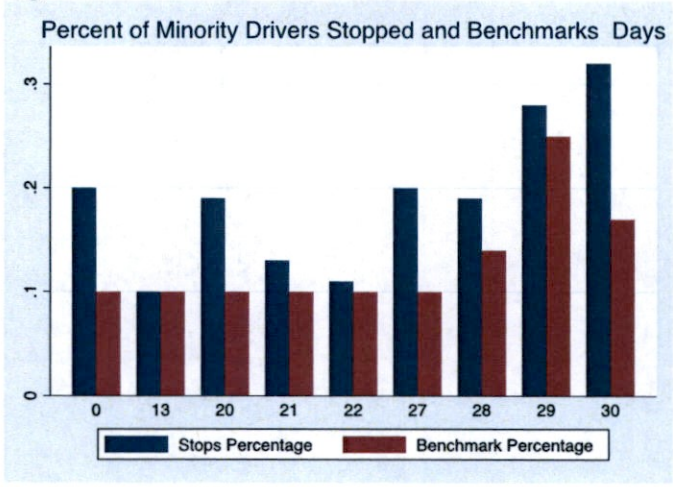
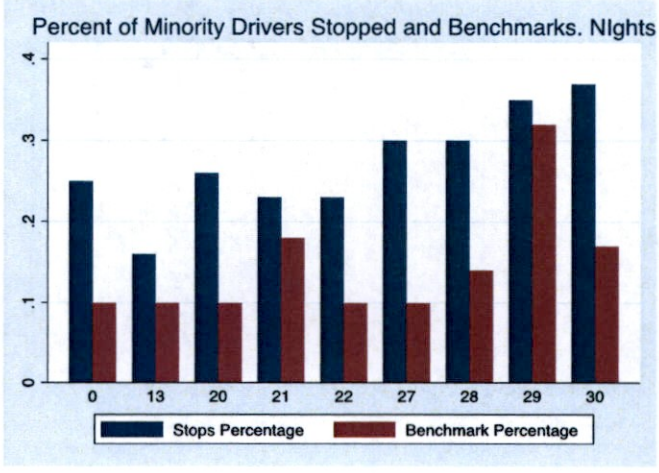


Figure 5



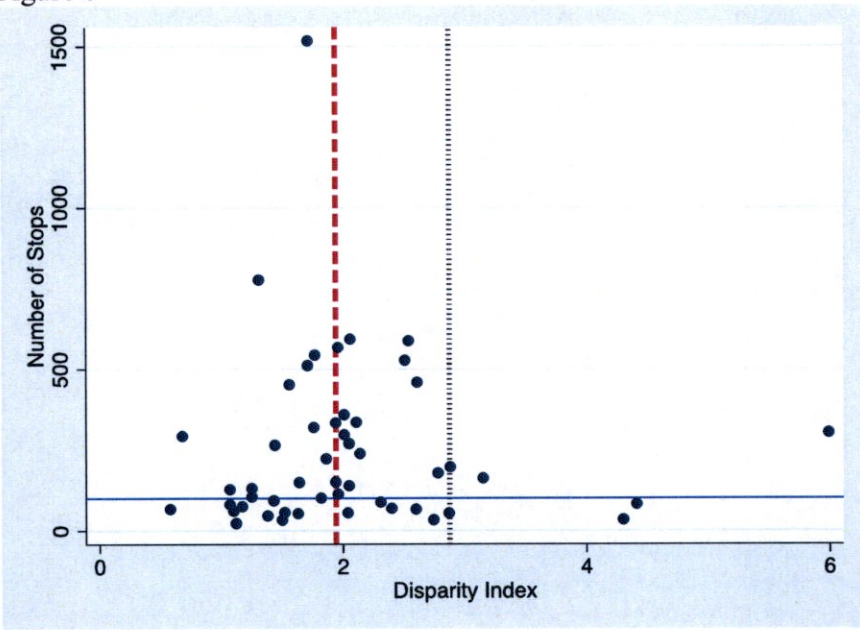
Officer Level Analysis:

We calculated a disparity index for each officer making more than twenty-five stops during 2016. The index consists of two ratios and was calculated by comparing the ratio of minority stops to minority benchmarks divided by whites stops to white benchmark values. A disparity index value equaling 1.00 indicates no disproportionality in stops, while values greater than 1.00 suggest disparity. The disparity index values can be interpreted as fractions or ratios. For instance, a disparity index value equaling 2.0 indicates that the odds were twice as likely that the officer would stop a minority driver as a non-minority driver (given the benchmarks). An

index value of 4.0 suggests the odds were four times as likely that the officer would stop a minority driver as non-minority driver, and so on.

Figure 6 gives the disparity index values and number of stops for ICPD officers making at least 25 traffic stops in 2016. The blue horizontal line in figure 4 indicates 100 stops, the red dashed line shows the median for the department and the black dashed line gives the 90th percentile for the department. The information in figure 6 **suggests that a single officer's** disparity index value is notably higher than other officers making traffic stops in 2016.

Figure 6



2017 Analyses

Figures 7 and 8 below give the number of ICPD traffic stops by observation zone and once again indicate that most ICPD traffic stops were made in the downtown area (zone 21) followed by the Broadway-Wetherby areas (zone 29).

Figure7

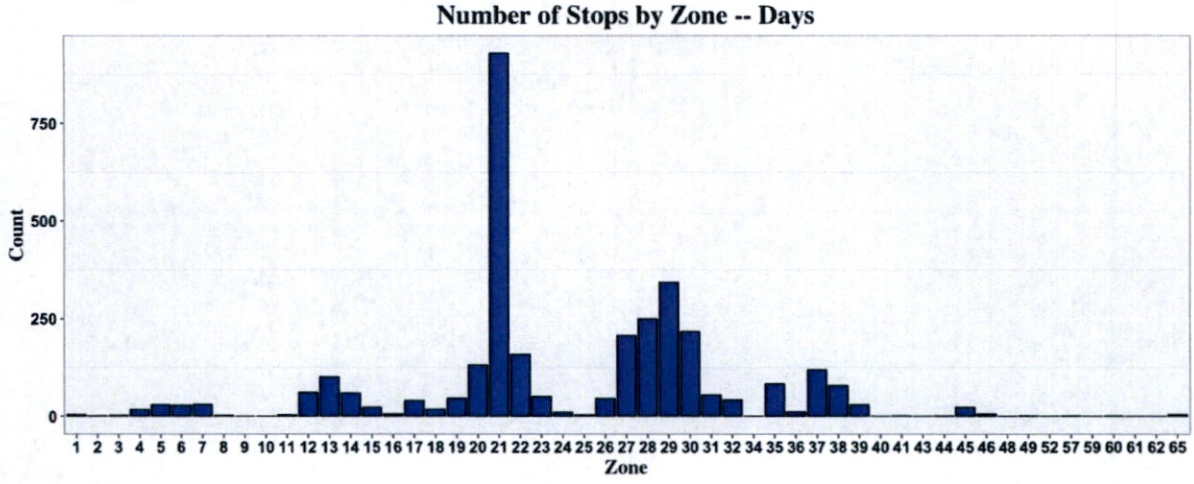
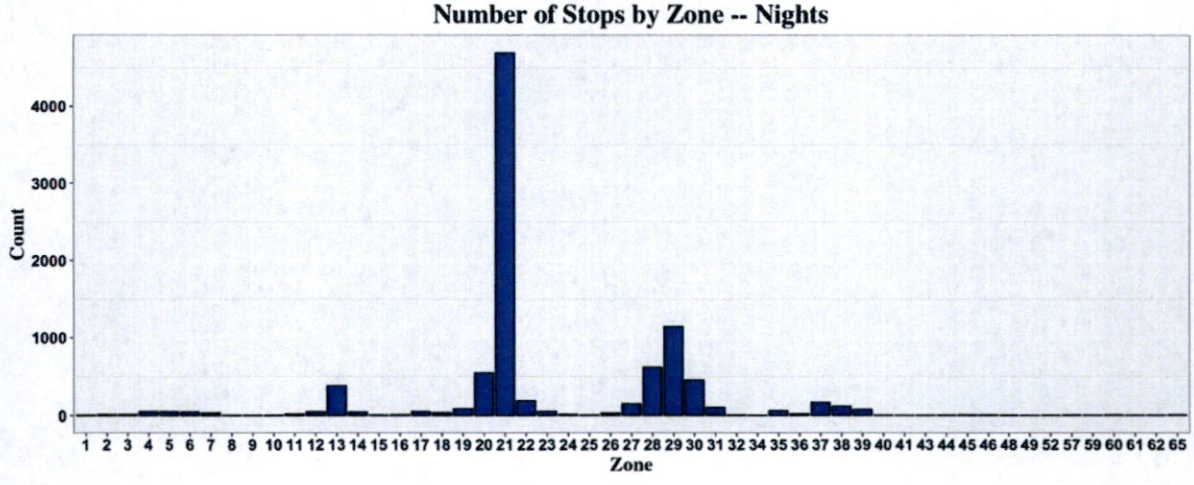


Figure 8



Figures 9 and 10 below give the percentage of minority drivers stopped and corresponding benchmark values for observation zones for both days and nights. As before, any positive difference between the percentage of minority drivers stopped and benchmark values signifies disproportionality. The information once again suggests that levels of disproportionality tended to be lowest in areas where the most stops were made and higher in areas where relatively fewer stops were made.

Figure 9

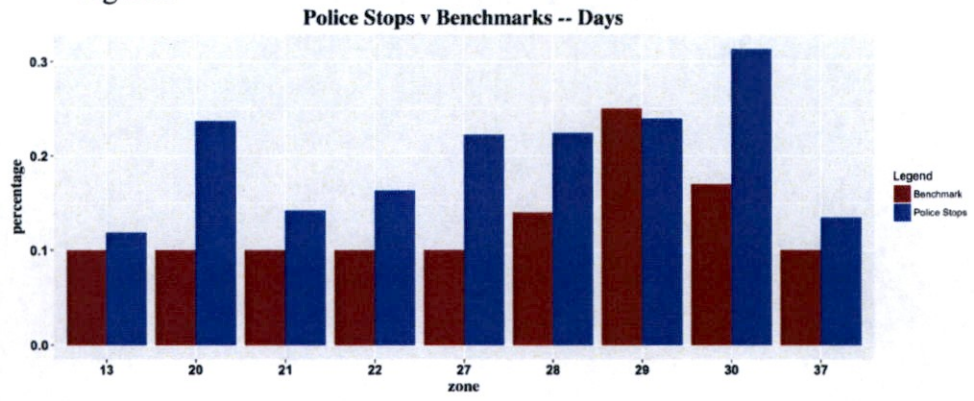
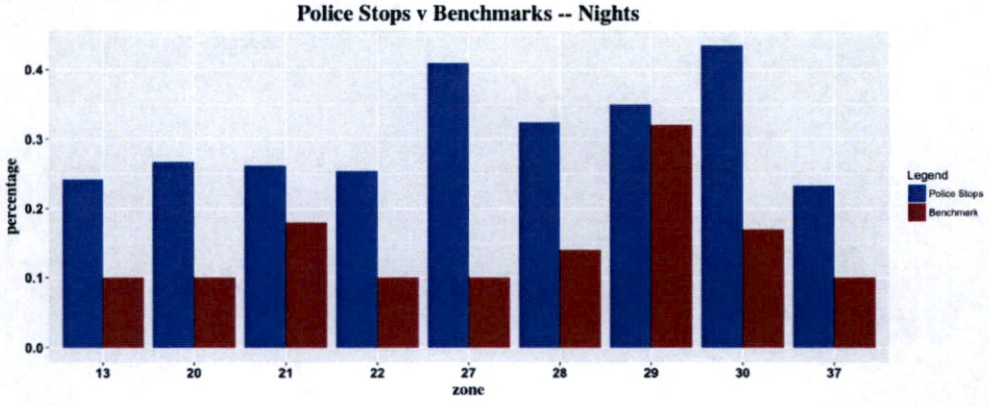


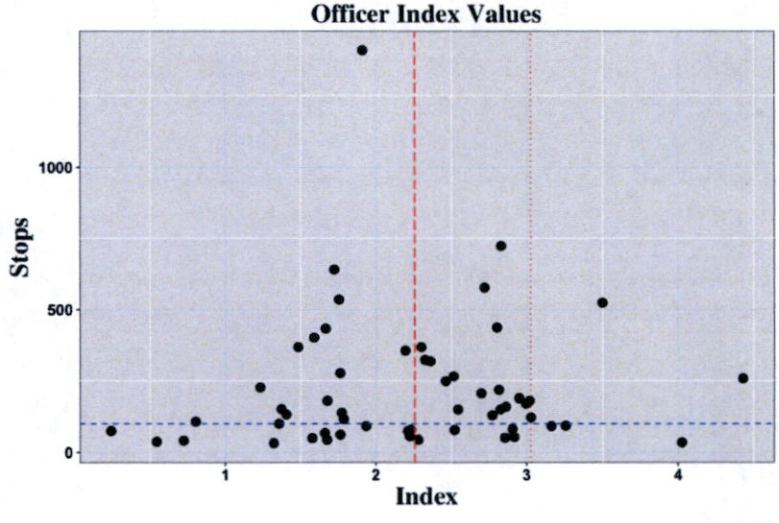
Figure 10



2017 Officer Level Analysis:

We again calculated a disparity index for each officer making more than twenty-five stops. Figure 11 gives the disparity index values and number of stops for ICPD officers making at least 25 traffic stops in 2017. The blue horizontal line in figure 4 indicates 100 stops, the thick red dashed line shows the median for the department and the thin red dashed line gives the 90th percentile for the department. The information in figure 11 shows that a single officer's disparity index value is notably higher than other officers making traffic stops in 2017. Please note that this is not the same officer depicted in the 2016 chart.

Figure 11



2016 and 2017 Stop Outcome Results

Stop Outcomes Results: We used an examination of stop *outcomes* to assess disproportionality in citations, warnings, arrests and consent searches. As the name implies, a stop outcome gives information about the consequence of a stop. An example is whether or not a driver received a ticket as a result of the stop. In what follows we measure disproportionality using an estimator called an *odds ratio*. This estimator is a measure of effect size and association. It is useful when comparing two distinct groups and summarizes the odds of something happening to one group to the odds of it happening to another group.

The odds ratio values shown in table 1 indicate that in 2016 Iowa City officers were slightly more likely to issue a citation to minority drivers than others but were also significantly more likely to arrest minority drivers and to ask for consent to search their vehicles. In 2017 the same trend continued, however officers did not make enough search requests for analyses to be performed (there were only 12). This information suggests that officers significantly decreased requests to search vehicles in 2017.

Table 1 department outcomes and univariate odds ratios by year

Odds Ratio	2005	2006	2007	2010	2011	2012	2013	2014	2015	2016	2017
Citations	-1.4	-1.5	-1.2	1.2	1.4	1.4	1.6	1.5	1.3	1.4	1.07
Arrests	2.5	2.8	2.6	3.1	3.2	2.5	2.3	2.1	1.9	1.5	1.82
Search	2.5	3.4	5.6	2.7	3.9	2.4	1.9	1.5	1.9	2.1	---
Hits	-1.6	1.2	-2.9	-2.3	-1.3	-1.2	1.1	-1.1	1.1	1.1	---

The information in table 1 also suggests that the odds ratios for search requests and hit rates have generally remained constant since 2013 indicating that levels of disproportionality did not change much for these outcomes during this period of time. The odds ratios for citations decreased recently, from 1.4 in 2016 to 1.07 in 2017. The information for arrests shows generally a decreasing trend in the level of disproportionality since 2013. Here, in comparison to white drivers, the odds that a minority member would be arrested during a traffic stop decreased from 2.3 in 2013, to 1.5 in 2016, however the odds did increase slightly to 1.82 in 2017.

Conclusions

This study examined the traffic stop behavior of the Iowa City Police Department using traffic stop data from 2016 and 2017—more than 24,000 stops. The investigation focused on two broad categories of discretionary police conduct: *(i)* racial disparity in vehicle stops and *(ii)* disparity in the outcome or disposition of a stop. Findings from the examination of disproportionality in vehicle stops show an increase in disproportionality from stops made in 2015. Additionally, the results of the analyses for stop outcomes indicate some racial disproportionality in certain outcomes—including moderate amounts in arrests and search requests (lesser amounts in citations). Future analyses should focus on assessing disproportionality found in certain observation zones. This work should include updating observational benchmarks in these areas.

This work is currently being done.