



ILLINOIS

TRAFFIC AND PEDESTRIAN STOP STUDY

2023 ANNUAL REPORT

TRAFFIC STOP ANALYSIS

SUBMITTED BY

THE MOUNTAIN-WHISPER-LIGHT: STATISTICS AND DATA SCIENCE



Illinois Department
of Transportation



Illinois Traffic and Pedestrian Stop Study

2023 ANNUAL REPORT: TRAFFIC STOPS

Part I Executive Summary and Appendices

Prepared for the Illinois Department of Transportation

By

The Mountain-Whisper-Light: Statistics & Data Science



In Cooperation with SC-B Consulting, Inc.



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Executive Summary

I. Background

In October 2019, The Mountain-Whisper-Light, Inc. (aka The Mountain-Whisper-Light: Statistics & Data Science, and hereafter, “TMWL”) was awarded a contract to conduct a statistical study of the traffic and pedestrian stop data provided by law enforcement agencies to the Illinois Department of Transportation, pursuant to the Illinois Vehicle Code, 625 ILCS 5/11-212 Traffic and Pedestrian Stop Statistical Study. TMWL is carrying out the project in cooperation with SC-B Consulting, Inc., an Illinois firm. Reports have already been issued on 2019, 2020, 2021 and 2022 traffic and pedestrian stops in Illinois and are available online at <https://www.idot.illinois.gov/transportation-system/local-transportation-partners/law-enforcement/illinois-traffic-stop-study>. (Click on “Studies.”)

According to the IDOT website, “On July 18, 2003, Senate Bill 30 was signed into law to establish a four-year statewide study of data from traffic stops to identify racial bias. The study began on January 1, 2004, and was originally scheduled to end December 31, 2007. However, the legislature extended the data collection several times, and also expanded the study to include data on pedestrian stops. Public Act 101-0024, which took effect on June 21, 2019, eliminated the study's scheduled end date of July 1, 2019, and extended the data collection.”

Under that provision of the Illinois Vehicle Code, IDOT is responsible for providing a standardized law enforcement data compilation form (see Appendix A below) and analyzing the data and submitting a report of the previous year's findings to the Governor, General Assembly, the Racial Profiling Prevention and Data Oversight Board, and each law enforcement agency no later than July 1 of each year. In May 2024, TMWL and SC-B, in cooperation with IDOT’s Bureau of Data Collection, have provided copies of statistical tables for 806 law enforcement agencies in the state of Illinois, based on data collection provided by the respective agencies on traffic and pedestrian stops. These 806 agencies reported at least one traffic or pedestrian stop. Among these agencies, 805 reported on traffic stops or on both traffic stops and pedestrian stops. One agency reported only on pedestrian stops. The agencies were invited to review and comment on the tables. Some agencies provided comments, and the comments from each agency that did provide comments are included with their tables in Part II of this report. Some comments have been responded to with additional information, and the readers of this report may wish to peruse the agency comments and responses. Comments on the Traffic stops tables (or general comments) and comments on the Pedestrian stops tables are included in the Part II Traffic or Pedestrian tables, respectively. Readers can be assured that the statistical results presented in this report are valid.

The Executive Summary in this document covers the traffic stops study and a companion volume with a similar format contains an Executive Summary for the pedestrian stops study.

Key Findings

1. The total number of reported traffic stops in 2023 was 2,260,647, a 12% increase from 2022 (Figure 1a).

2. Nearly 80% of agencies provided complete stop data for 2023, which is similar to 2022 (79%). Agencies not collecting a full year of stop data (incomplete) or not submitting existing stop data (non-compliant) comprised 18%, a decrease from 21% in 2022 (Table 2).
3. Traffic stop rates in 2023 for each of the six racial groups increased from 2021-2022 except for Native Hawaiian or Other Pacific Islander, which decreased slightly (Figure 2).
4. A number of drivers were stopped multiple times in 2023. Individual Black drivers who were stopped in 2023 had a 36% higher chance of being stopped a total of two to three times than individual white drivers who were stopped; Black drivers were three times more likely to be stopped four to 10 times, and nine times more likely to be stopped more than 10 times than white drivers who were stopped (Figure 3).
5. In an analysis of a subset of agencies with a large number of stops, slightly more than three-quarters of stop rate ratios comparing stop rates of minorities to stop rates of white drivers show that minorities were stopped at higher rates than whites in some agencies (Table 5.a).
6. Black drivers were stopped at higher rates than white drivers in 95% of large agencies (Table 5.b).
7. Hispanic drivers were stopped at higher rates than white drivers in 81% of large agencies (Table 5.b)

II. Introduction

What is racial profiling?

The Illinois Criminal Justice Information Authority describes racial profiling as “police-led action that is initiated based on a person’s race or ethnicity.”¹ References can be found at the end of this section. In 2003, legislation called the Illinois Traffic and Pedestrian Stop Statistical Study Act was passed requiring officers to document who/why they stopped individuals for traffic violations. These data are reported annually to the Illinois Department of Transportation for review. In 2019, this Act became permanent and supports a Task Force to compile and analyze the resulting data.² This analysis provides statistical results for use in those ongoing efforts. The statistical results can be used to detect potentially “statistically significant aberrations” in traffic stops, pedestrian stops and searches of drivers and pedestrians (see Section I and Appendix D for more details). Findings are made available to the public and shared with law enforcement agencies to increase their awareness of potential racial profiling in their stops, providing a basis to reduce or eliminate bias, if it is occurring. The IDOT Racial Profiling Prevention and Data Oversight Board meets regularly to oversee these efforts in an advisory capacity and provide recommendations to the Governor's office.

How is this report structured?

The report is presented in two parts. **Part I** is this Executive Summary, which includes appendices with detailed technical information on the statistical methodology and analysis. **Part II** includes extensive tables (one set of tables for each law enforcement agency that collected data for all stops reported in 2023). The tables show stop rates for each racial group, along with other statistics that cover activity during the stops, such as citations or warnings, searches and contraband found.

To obtain the greatest benefit from this report, readers are encouraged to read the full Executive Summary. In addition to the information on data collection, a sample Traffic Table is provided and a Guide to Using Traffic Tables, which includes definitions of statistical terms used in this report and an

explanation of the data presented in each panel of the tables. Also included is an Interpretation section with additional details on the numeric results presented in the tables and a plain-language description of how the analysis was implemented. Finally, the section on Selected Findings highlights some statewide results. The Appendices include technical material that describes the statistical methods and calculations in detail. The information in the appendices is provided for readers who wish to have a deeper understanding of the methodology.

What are the sources of the data?

As noted above, per Illinois law, officers from law enforcement agencies are required to fill in a report when they stop a driver or a pedestrian. Separate templates are provided for traffic and pedestrian stops.

To follow the convention of previous reporting on the Illinois Traffic and Pedestrian Stop Study, two separate reports are submitted, the Illinois Traffic Stop Study and the Illinois Pedestrian Stop Study. The above-mentioned data collection templates (known as Traffic Stop or Pedestrian Stop Data Forms) are shown in Appendix A of the ITSS and IPSS. There is an instruction manual that accompanies the traffic stop data collection form—available online at <https://idot.illinois.gov/transportation-system/local-transportation-partners/law-enforcement/reporting/illinois-traffic-and-pedestrian-stop-study/forms.html>.

How were the data analyzed?

The results of the data collection are that 805 agencies generated data on 2,260,725 traffic stops and 242 agencies generated data on 83,149 pedestrian stops in 2023. A total of 806 agencies provided data on either traffic stops or pedestrian stops, with 564 agencies providing traffic stop data only, one agency providing pedestrian stop data only, and 241 agencies providing both traffic and pedestrian stop data. Among 805 agencies that provided traffic stops, 802 were considered compliant with the study, two were disbanded (their reported stops, before they were disbanded, are included in statewide analysis) and one agency was deemed non-compliant. Only 78 traffic stops (0.003% of traffic stops) were missing the race designation and did not enter into the analysis. None of the reported pedestrian stops was missing the race designation, and all 242 agencies that reported pedestrian stops were deemed compliant with the study. Further analysis was carried out to provide statistics that may be helpful in determining if there is potential bias against minorities in initiating a stop or in the activities that occur during a stop.

As specified by the Illinois statute for this study, the tables report on the stops and subsequent experience of individuals stopped. The stopped individuals are classified into one of six racial groups. The law enforcement officer filling in the data collection form must use their judgment to classify an individual into one of the following groups:

- Black or African American
- Hispanic or Latino
- Asian
- American Indian or Alaska Native
- Native Hawaiian or Other Pacific Islander
- White.

The data collection forms are extensive. There are more than 60 data items listed for traffic stops and more than 20 data items listed for pedestrian stops. Some items are left blank unless there are further actions beyond a stop, such as a search.

Data collected by local agencies for traffic stops include:

- Information about the driver (including race) and the officer
- The location of the stop (using location designations developed by each agency)
- Reason for the stop
- Outcome of the stop
- Search activity and search findings of contraband.

References (for Section II)

1. Green, E., & Lavery, T. (2022). *2020-2021 Illinois Traffic and Pedestrian Stop Data Use and Collection Task Force Findings*. Illinois Criminal Justice Information Authority.
2. Illinois General Assembly. (2022, May 13). *Traffic and Pedestrian Stop Statistical Study*. Website. <https://www.ilga.gov/legislation/ilcs/fulltext.asp?DocName=062500050K11-212>

III. Guide to Using Traffic Tables

While many readers of this report previously reviewed traffic and pedestrian stop tables for their respective jurisdictions, here are some brief explanations of the statistics presented in the tables of this report.

Table 1 is included as an example to show stop rates, along with certain percentages and ratios. A ratio compares either a rate or a percentage for a minority to the corresponding rate or percentage for whites. The ratios are intended to make it easier to compare a minority to whites on stop rates and other statistics that may suggest the possibility of racial profiling. The word “possibility” is very important, because racial profiling cannot be proved by the numeric results in this report alone. Some of the inherent uncertainties and limitations of the statistics are explained throughout this report and should be considered during the review of the statistical results presented.

The following section includes an example of traffic tables and offers a guide to the numbers in the tables, explained panel by panel. The table reproduced here (Table 1) refers to all traffic stops reported in 2023 from law enforcement agencies in the state. The counts, rates, percentages and ratios are for purposes of illustration only and are not tied to any individual agency.

Before using the tables: Following the tables there is an important section on interpretation of the rates, ratios, percentages and 95% confidence intervals. Reading that section is important for readers of this report to make a proper assessment of what the numbers represent.

Rates, percentages and ratios: The terms “rate,” “percentage” and “ratio” are used throughout this report. A brief explanation of the terms is provided here.

A **rate** in this context is the number of individuals (such as the number of individuals stopped) divided by the population the individuals came from, also known in this report as the “benchmark,” a term that will be used repeatedly. For example, in Illinois in 2023 there were 471,208 traffic stops of individuals whom

the officer assigned to the category “Hispanic or Latino.” The estimated benchmark population of Hispanic or Latino drivers in Illinois in 2023 was 2,006,266. Dividing the 471,208 by 2,006,266 yields the stop rate of 0.235. That is, there was an average of 0.235 stops per driving member of the Hispanic or Latino population. The decimal value 0.235 does not mean that 23.5% of Hispanic or Latino drivers had a stop. Some drivers may have been stopped more than once.

A **percentage** in this context has the usual meaning. For example, in Illinois in 2023 there were 1,030,005 stops of drivers whom the officer assigned to the category “white.” There were 616,326 of those stops with a citation for a moving violation. The number of stops with citations (616,326) divided by the number of stops (1,030,005) yields the decimal fraction 0.598, or 59.8%. In Illinois in 2023, 59.8% of stops of drivers assessed as being white resulted in a citation of the driver.

The **ratio** used in this report is either the ratio of a minority rate to a white rate or the ratio of a minority percentage to a white percentage. If the ratio is 2.0, for example, it means that the minority rate (or percentage) is twice the white rate (or percentage).

Table 1 shows the Illinois statewide results for illustration of traffic stop reporting. Following is a guide to each panel of the table.

Panel 1 (shaded rows) presents the traffic stops, benchmark, and stop rate by racial group, and stop rate ratio for each minority group compared to white drivers. The 95% confidence intervals are shown (in parentheses) for rates and rate ratios. The 95% confidence interval is a margin of error, and it is explained in a short section with that heading below.

Panel 2 shows the number, percentage (in parentheses), and 95% confidence interval [in square brackets, like this] for selected reasons for traffic stops (moving violation, equipment, licensing/registration, and commercial vehicle) for each racial group. The label for the panel includes the note “Percentage of All Stops for the Racial Group with the Noted Reason for Stop.” This means that the number of stops for a given reason, such as “Moving Violation,” is divided by the total number of stops for the racial group to convert it to a percentage (after multiplication by 100%). For example, drivers assessed as being Asian had 50,413 stops noted by the officer as “Moving Violation,” and the Asian category had 82,152 total stops in 2023. Hence the percentage of stops noted as “Moving Violation” for drivers classified as Asian was $100\% \times (50,413/82,152) = 61.4\%$ (rounded).

Panel 3 shows the outcomes of traffic stops including written warning, verbal warning and citation for each racial group. The number, percentage (in parentheses), and 95% confidence interval [in brackets] are shown for each outcome. The ratio and 95% confidence interval (in parentheses) comparing each Minority group to White drivers are shown for citations, the most serious outcome recorded for the stop on the traffic data collection form.

Panel 4 shows vehicle searches and outcomes of vehicle searches during traffic stops, including consent searches, all searches, and whether contraband was found during any search for each racial group. The number, percentage (in parentheses), and 95% confidence interval [in brackets] are shown for each outcome. The label for each row shows the basis for calculation of the percentages. The contraband-found percentage is calculated based on all vehicle searches. The ratio and 95% confidence interval (in parentheses) comparing each minority group to white drivers are shown for

contraband found for all vehicle searches. (Note: Searches following a dog sniff are not included in Panel 4. See Panel 6 for the statistics on stops with a dog sniff.)

Panel 5 shows driver and passenger searches and outcomes of these searches during traffic stops including consent searches, all searches and whether contraband was found during any search for each racial group. The number, percentage (in parentheses), and 95% confidence interval [in brackets] are shown for each outcome. The label for each row shows the basis for calculation of the percentages. The contraband-found percentage is calculated based on all driver or passenger searches. The ratio and 95% confidence interval (in parentheses) comparing each minority group to white drivers are shown for contraband found for all driver or passenger searches. (Note: Searches following a dog sniff are not included in Panel 5. See Panel 6 for the statistics on stops with a dog sniff.)

Panel 6 shows dog sniffs, searches, and outcomes of these searches during traffic stops, including dog alerts during a dog sniff, vehicle searches after a dog sniff and whether contraband was found after any vehicle search for each racial group. The number, percentage (in parentheses) and 95% confidence interval [in brackets] are shown for each outcome. The label for each row shows the basis for calculation of the percentages. The percentage of dog sniffs with a dog alert and the percentage of vehicle searches after a dog sniff are calculated based on all dog sniffs. The percentage for contraband found after a vehicle search is calculated based on all vehicle searches after a dog sniff, and the ratio and 95% confidence interval (in parentheses) are shown for contraband found for all vehicle searches after a dog sniff.

The top-right corner of the table indicates the type of benchmark used. Crash-based benchmarks utilize Illinois crash report data and distance-based benchmarks combine population statistics from surrounding ZIP codes while accounting for distance of the ZIP code area to the agency. The note at the bottom (left) of the table indicates the type of benchmark (crash-based or distance-based) and, if the benchmark is crash-based, the note states the number of crashes that were utilized. The note also lists the primary area of the benchmark, which captures the jurisdiction of the agency. These areas can be one or more cities (or towns or villages), counties or the state. All traffic benchmarks also include areas outside of the primary area. The percentage of the benchmark which comes from ZIP codes within the primary area is provided, and an indication of the overall area of the benchmark is provided by a radius around the primary area (in miles). Section V on benchmarks provides more information on how the benchmarks were constructed.

A ratio of 1.0 for Whites: For all rows showing comparisons of minority groups to whites, a value of 1.0 is shown in the white racial group column, the reference group. In this column for whites, the whites are being compared to themselves, so the ratio of rates must be 1.0. The column is included to make it clear that the whites are the reference group to which each minority is compared.

Zero stops or zero benchmark: For some agencies, the number of stops or the benchmark value or the number of outcomes may be zero for a racial group. When it is not possible to calculate a rate, percentage or ratio and an associated 95% confidence interval because of zero stops or zero benchmarks or zero outcomes, an “NA” is reported in the table. When reporting information such as searches following stops or contraband found, there are cases when all racial groups have entries of zero in the row. That is, there were no searches of any racial group, or no contraband found for any racial group. In that case, the row is omitted. Similarly, when making comparisons to whites, if all minorities have counts of zero or the whites have a count of zero, the ratios comparing each minority to whites cannot be computed and the row of ratios is omitted.

Table 1. Example of a table of traffic stops: Counts, Rates, Percentages and Ratios

Summary of Traffic Stops for 2023 - ILLINOIS STATEWIDE RESULTS							Benchmark: Crash-based*
	White	Black or African American	Hispanic or Latino	Asian	American Indian or Alaska Native	Native Hawaiian or Other Pacific Islander	
Panel: 1 Summary of Traffic Stops, Rates, and Rate Ratios with 95% Confidence Intervals. Total stops: 2,260,647. Total benchmark population: 9,783,254.							
Stops (% of Total)	1,030,005 (46%)	661,412 (29%)	471,208 (21%)	82,152 (3.6%)	9,695 (0.4%)	6,175 (0.3%)	
Benchmark (% of Total)	5,217,253 (53%)	1,931,447 (20%)	2,006,266 (21%)	590,359 (6%)	32,209 (0.3%)	5,720 (0.06%)	
Stop Rate (95% Confidence Interval)	0.1974 (0.197 - 0.1978)	0.3424 (0.3416 - 0.3433)	0.235 (0.234 - 0.236)	0.139 (0.138 - 0.14)	0.301 (0.295 - 0.307)	1.08 (1.05 - 1.11)	
Stop Rate Ratio vs White (95% Confidence Interval)	1.0	1.73 (1.72 - 1.75)	1.19 (1.18 - 1.2)	0.705 (0.698 - 0.712)	1.52 (1.49 - 1.56)	5.5 (5.3 - 5.6)	
Panel: 2 Summary of Reason for Stop - Number (Percentage of All Stops for the Racial Group with the Noted Reason for Stop) [95% Confidence Interval]							
Moving Violation	616,326 (59.8%) [59.7% - 60%]	277,055 (41.9%) [41.7% - 42%]	218,010 (46.3%) [46.1% - 46.5%]	50,413 (61.4%) [60.8% - 61.9%]	5,570 (57%) [56% - 59%]	3,924 (64%) [62% - 66%]	
Equipment	171,578 (16.66%) [16.58% - 16.74%]	142,143 (21.5%) [21.4% - 21.6%]	112,042 (23.8%) [23.6% - 23.9%]	16,249 (19.8%) [19.5% - 20.1%]	2,138 (22%) [21% - 23%]	1,128 (18%) [17% - 19%]	
Licensing/Registration	235,358 (22.85%) [22.76% - 22.94%]	239,802 (36.3%) [36.1% - 36.4%]	137,373 (29.2%) [29% - 29.3%]	15,105 (18.4%) [18.1% - 18.7%]	1,938 (20%) [19% - 21%]	1,084 (18%) [17% - 19%]	
Commercial Vehicle	6,729 (0.65%) [0.64% - 0.67%]	2,346 (0.35%) [0.34% - 0.37%]	3,758 (0.8%) [0.77% - 0.82%]	382 (0.47%) [0.42% - 0.51%]	49 (0.51%) [0.37% - 0.67%]	39 (0.63%) [0.45% - 0.86%]	
Panel: 3 Summary of Outcome of Stop - Number (Percentage of All Stops for the Racial Group with the Noted Outcome of Stop) [95% Confidence Interval]							
Verbal Warning	277,568 (26.9%) [26.8% - 27%]	359,648 (54.4%) [54.2% - 54.6%]	228,999 (48.6%) [48.4% - 48.8%]	34,250 (41.7%) [41.3% - 42.1%]	4,647 (48%) [47% - 49%]	3,300 (53%) [52% - 55%]	
Written Warning	399,712 (38.8%) [38.7% - 38.9%]	139,166 (21%) [20.9% - 21.2%]	104,373 (22.2%) [22% - 22.3%]	25,260 (30.7%) [30.4% - 31.1%]	2,488 (26%) [25% - 27%]	1,354 (22%) [21% - 23%]	
Citation	352,725 (34.2%) [34.1% - 34.4%]	162,598 (24.6%) [24.5% - 24.7%]	137,836 (29.3%) [29.1% - 29.4%]	22,642 (27.6%) [27.2% - 27.9%]	2,560 (26%) [25% - 27%]	1,521 (25%) [23% - 26%]	
Citation Ratio vs White (95% Confidence Interval)	1.0	0.718 (0.714 - 0.722)	0.854 (0.849 - 0.86)	0.8 (0.79 - 0.82)	0.77 (0.74 - 0.8)	0.72 (0.68 - 0.76)	
Panel: 4 Summary of Vehicle Search Events - Number (Percentage for the Racial Group) [95% Confidence Interval]							
Consent Search (% of Stops)	9,300 (0.9%) [0.88% - 0.92%]	8,751 (1.32%) [1.3% - 1.35%]	5,127 (1.09%) [1.06% - 1.12%]	413 (0.5%) [0.46% - 0.55%]	74 (0.76%) [0.6% - 0.96%]	62 (1%) [0.77% - 1.3%]	
All Searches (% of Stops)	57,426 (5.58%) [5.53% - 5.62%]	35,448 (5.36%) [5.3% - 5.42%]	19,073 (4.05%) [3.99% - 4.11%]	1,169 (1.4%) [1.3% - 1.5%]	255 (2.6%) [2.3% - 3%]	157 (2.5%) [2.2% - 3%]	

Summary of Traffic Stops for 2023 - ILLINOIS STATEWIDE RESULTS

Benchmark: Crash-based*

	White	Black or African American	Hispanic or Latino	Asian	American Indian or Alaska Native	Native Hawaiian or Other Pacific Islander
Contraband Found (% of All Searches)	11,694 (20.4%) [20% - 20.7%]	15,585 (44%) [43% - 45%]	6,093 (32%) [31% - 33%]	214 (18%) [16% - 21%]	57 (22%) [17% - 29%]	41 (26%) [19% - 35%]
Contraband Found Ratio vs White (95% Confidence Interval)	1.0	2.16 (2.11 - 2.21)	1.57 (1.52 - 1.62)	0.9 (0.78 - 1)	1.1 (0.83 - 1.4)	1.3 (0.92 - 1.7)

Panel: 5 Summary of Driver or Passenger Search Events - Number (Percentage for the Racial Group) [95% Confidence Interval]

Consent Search (% of Stops)	6,712 (0.65%) [0.64% - 0.67%]	6,315 (0.95%) [0.93% - 0.98%]	3,326 (0.71%) [0.68% - 0.73%]	181 (0.22%) [0.19% - 0.25%]	47 (0.48%) [0.36% - 0.64%]	44 (0.71%) [0.52% - 0.96%]
All Searches (% of Stops)	36,840 (3.58%) [3.54% - 3.61%]	25,240 (3.82%) [3.77% - 3.86%]	14,738 (3.13%) [3.08% - 3.18%]	661 (0.8%) [0.74% - 0.87%]	158 (1.6%) [1.4% - 1.9%]	110 (1.8%) [1.5% - 2.1%]
Contraband Found (% of All Searches)	3,465 (9.4%) [9.1% - 9.7%]	3,274 (13%) [12.5% - 13.4%]	1,047 (7.1%) [6.7% - 7.5%]	39 (5.9%) [4.2% - 8.1%]	12 (7.6%) [3.9% - 13%]	9 (8.2%) [3.7% - 16%]
Contraband Found Ratio vs White (95% Confidence Interval)	1.0	1.38 (1.31 - 1.45)	0.76 (0.7 - 0.81)	0.63 (0.45 - 0.86)	0.81 (0.42 - 1.4)	0.87 (0.4 - 1.7)

Panel: 6 Summary of Dog Sniff Events - Number (Percentage for the Racial Group) [95% Confidence Interval]

Dog Sniff (% of Stops)	2,857 (0.28%) [0.27% - 0.29%]	1,253 (0.19%) [0.18% - 0.2%]	755 (0.16%) [0.15% - 0.17%]	89 (0.11%) [0.087% - 0.13%]	14 (0.14%) [0.079% - 0.24%]	1 (0.02%) [0.0004% - 0.09%]
Dog Alert after Dog Sniff (% of Dog Sniffs)	2,255 (79%) [76% - 82%]	889 (71%) [66% - 76%]	519 (69%) [63% - 75%]	70 (79%) [61% - 99%]	9 (64%) [29% - 100%]	1 (100%) [2.5% - 100%]
Vehicle Search after Dog Sniff (% of Dog Sniffs)	2,187 (77%) [73% - 80%]	854 (68%) [64% - 73%]	483 (64%) [58% - 70%]	65 (73%) [56% - 93%]	8 (57%) [25% - 100%]	1 (100%) [2.5% - 100%]
Contraband Found (% of Vehicle Searches, preceding row)	1,330 (61%) [58% - 64%]	542 (63%) [58% - 69%]	200 (41%) [36% - 48%]	23 (35%) [22% - 53%]	1 (12%) [0.32% - 70%]	0 (0%) [0% - 100%]
Contraband Found Ratio vs White (95% Confidence Interval)	1.0	1 (0.94 - 1.2)	0.68 (0.58 - 0.79)	0.58 (0.37 - 0.88)	0.21 (0.0052 - 1.1)	0 (0 - 6.1)

***Benchmark Definition**

Benchmark Type: Crash-based (162,838 crash reports used).
 Primary Benchmark Area (State): Illinois.
 93.4% of the benchmark comes from zip codes within the primary area.
 95.1% of the benchmark comes from zip codes within 12 miles of the primary area, including the primary area.

IV. Interpretation of Traffic Tables

95% Confidence Interval

Table 1 presents a “95% confidence interval” for each rate, percentage, or ratio. The 95% confidence interval reflects uncertainty in estimating the rate, percentage, or ratio due to sampling variability. The 95% confidence interval provides a range of plausible values. The 95% figure means that when various studies include such an interval, 95% of the studies, on average, will include the *true* value in the interval. Because there is an element of chance involved in being stopped, being searched, etc., the true value of a rate or percentage or ratio is not known. The 95% confidence interval uses widely accepted methods and expresses some of the uncertainty in the estimated rate, percentage or ratio. The uncertainty is often due to small numbers of stops or a small benchmark population in the geographic area used to calculate rates, percentages or ratios.

Ratios

A ratio of rates or percentages with a value of 1.0 indicates that the rates or percentages are equal between the minority group and whites. Ratios above or below 1.0 show greater or lesser stop activity with minorities, respectively. Comparisons of minority groups to white drivers or white pedestrians where the 95% confidence interval lies above 1.0 are **bolded** in the stops tables. One can say that the value of 1.0 does not fall within the 95% confidence interval of the estimated ratio. These **bolded** ratios are statistical deviations and may be the basis for further consideration of potential racial disparities related to stops. A **bolded** ratio does not prove that there is racial profiling but may be taken as the basis for further inquiry. In addition to whether or not a ratio is **bolded**, the absolute magnitude of the ratio should be considered. For example, a **bolded** ratio of 5.0 is a higher priority to investigate than a small, bolded ratio of 1.2. A larger ratio implies that the potential impact on individuals is larger, and it is less likely that the elevated ratio is only due to limitations of the chosen benchmark than when the ratio is closer to 1.0.

Limitations

There is a limitation in the use of ratios to determine potential racial disparities. The 95% confidence intervals for stop rates and stop rate ratios do not consider the error in estimating the driver and pedestrian benchmark populations. (The population of drivers or pedestrians who are considered the source of the persons stopped in a given jurisdiction are a population, and that population is referred to as the “benchmark” for the jurisdiction.) Note that each law enforcement agency has a “jurisdiction,” which is the geographic area that the agency is responsible for policing. In this report “agency” and “jurisdiction” are sometimes used interchangeably.

The benchmarks attempt to estimate the actual driving population within the jurisdiction of each agency using a combination of data sources, including surveys by the U.S. Census Bureau, Illinois crash reports (collected by IDOT) and Illinois driver’s license counts (provided by the Secretary of State’s office). These data can only approximate the driving populations and necessarily rely on particular assumptions, which may not always be accurate. Thus, the benchmarks may have some uncertainty, and the extent of the uncertainty is unknown. If it were possible to estimate this uncertainty as it affects rates and rate ratios, the 95% confidence intervals would be wider and, thus, confidence intervals for some ratios might then include 1.0 (a ratio of 1.0 may indicate no racial disparity). A confidence interval overlapping 1.0 would

not prompt bolding and the need for further inquiry. The section labelled “**Benchmarks**”, below, describes the methods used to estimate the population from which stopped individuals originated.

Another limitation that may affect the rates, percentages and ratios is the designation of race by the law enforcement officer conducting the stop. That designation of race might not correspond to the driver’s or pedestrian’s own racial identity. The possibility of errors by the officer in assigning a race is considered in a later section of this report. In addition, the stop rate for a racial group will depend on a) the assignment of beats (geographic surveillance area) to officers in a jurisdiction and b) the degree of overlap of those beats to the residential area of each racial group. If there is higher (or lower) surveillance of an area with a high residential concentration of a racial group, that can lead to a higher (or lower) stop rate for the racial group compared to areas where surveillance is constant across all racial groups.

Statistics based on stops only

The percentages and ratios of percentages in the tables are based on stop counts and stop activity only. The percentages and ratios of percentages do not depend on the estimated benchmark population, and they do not have the potential benchmark error noted above. Percentages based on stops will be a resource for any inquiry about potential racial profiling.

It is important to note that the percentages are calculated with reference to a specific activity. For example, in the traffic tables, the percentage of searches for a racial group is a percentage of *stops* leading to a search. The percentage of contraband found in a vehicle is the percentage of *vehicle searches* leading to contraband found. For percentages, each row label (or the heading for the panel) indicates the basis for the percentage.

Can stop rates be compared across years?

The methodology used for calculating stop rates in this study, using a population benchmark, differs from studies of stops in 2019-2020 and in 2018 and earlier. The methodology is largely the same as used for the 2021-2022 stops reports. See Section V below for specific details on the benchmarks. While the new methodology provides more accurate estimates of the racial composition of the driving population, the changes impact comparisons of results from the 2021-2022 stops analysis to the analyses in 2019-2020 and to the analyses in years prior to 2019. Comparisons of 2023 to 2019-2020 are easier than comparisons of 2023 to 2004-2018 because the table formats are very similar even though there are some underlying methodological differences.

These and other changes have improved the estimate of the benchmark populations and the accuracy of stop rate ratios. Thus, any difference in rate ratios between 2021-2023 stops reports and earlier stops reports (2019-2020 and 2004-2018) may be at least partly due to a change in statistical methods used in this report rather than to a real change in stop rates. The new methods are intended to estimate the benchmark population more accurately. Another factor making it difficult to compare 2023 stop rates to 2018 rates (and earlier) is that the 2023 report presents rates, percentages and rate ratios separately for each of the six individual races — rather than with all minorities combined into one category as used in the 2018 and earlier reports. Perusal of tables in Part II of this report will show the reader that the five minority races do have different stop rates. The statewide rates in Table 1, Panel 1, above, show a diversity of stop rates among the six races, and, also, among the five Minority races. The 2019-2020

reports also reported results separately for each individual race, making comparisons of 2019-2020 to 2021-2023 more straightforward.

Certain percentages will be comparable across years, because the percentages are based on stops data only, and percentages are calculated in the same manner as in previous years. However, to compare a percentage based on 2023 stops data to a percentage reported in a year prior to 2019, some additional calculations will be needed. This 2023 stops report and the 2019-2022 stops reports present results for each racial group, whereas reports prior to 2019 combined five races into one group: all minorities. To calculate a percentage for 2023 stops of all minorities, the user will need to add together (across the five minority racial groups) all of the numerators and, separately, all of the denominators and then divide the numerator sum by the denominator sum, then multiply by 100% to get the all-minority percentages. As noted earlier, this report presents results for each racial group separately, since the minority groups do have differing rates, percentages, and ratios in some jurisdictions. The method used to calculate stop rate ratios (comparing each minority to whites) also changed after 2018. The rate ratios for the 2019 and later stops reports is more accurate than the ratios as calculate from 2018 reports and earlier.

V. Benchmarks

The number of stops for each racial group and each agency is compared to a “benchmark” to calculate the agency’s stop rate for the racial group. The benchmark provides an estimated population count for each of the six racial groups. These population counts are then compared to the traffic stop counts of each racial group to assess and compare the stop rates (stops per unit of population) of each racial group. See Appendix C of the previous year’s report¹, Technical Notes on Benchmarks, for a detailed discussion of benchmarks and associated calculations, including important limitations.

The methods for calculating the benchmark for each agency for this report are similar to the methods used for the report on 2021-2022 stops. Briefly, traffic stop benchmarks are based on the U.S. Census Bureau’s most recent American Community Survey population statistics tabulated at the ZIP code level. For agencies with a sufficient number of crash reports available in their jurisdiction, the Illinois traffic crash report data (based on 2020-2022 SR 1050 crash reports²) were used to build the traffic stop crash-based benchmarks. For the other agencies (without sufficient crash reports) the traffic stop benchmarks were constructed by combining ZIP code data from the surrounding area, weighted by the distance from the agency’s jurisdiction (distance-based benchmarks). Both types of benchmarks (crash-based and distance-based) combined populations from ZIP codes directly associated with an agency (e.g., the ZIP codes of a city for a city police agency) as well as populations from ZIP codes from the surrounding area. Note that the traffic stop and pedestrian stop benchmark methodologies differ because of the different data sources available to generate them. Thus, it is not unusual for there to be notable differences between the traffic and pedestrian benchmarks for the same agency.

¹ <https://idot.illinois.gov/content/dam/soi/en/web/idot/documents/transportation-system/reports/safety/traffic-stop-studies/final--part-i-executive-summary-traffic--6-30-23.pdf>.

² <https://idot.illinois.gov/content/dam/soi/en/web/idot/documents/transportation-system/manuals-guides-and-handbooks/safety/illinois-traffic-crash-report-sr-1050-instruction-manual-2019.pdf> (last accessed June 13th, 2024).

VI. Selected Findings

This section of the report shows some tables and figures that present results on the agencies and their stops from the entire State of Illinois for 2023. Some results are contrasted with their corresponding 2021 and/or 2022 values.

COVID-19: 2019 and Later

The COVID-19 pandemic in the United States continued to have a substantial impact on the number of stops made in 2021 and some in 2022 and 2023, as is apparent from multiple figures shown below. The first confirmed case of COVID-19 was detected in Illinois on January 23, 2020³. On March 16 and 17, 2020, the state government closed bars, restaurants and schools⁴ and ultimately issued a statewide stay-at-home order starting March 21, 2020⁵.

Agency reporting status

Among the 997 agencies that were active at the end of 2023 and could submit stops data to IDOT, 78.9% of the agencies had stops and provided complete stops data to IDOT (Table 2, top numeric row), which is similar to 2022. Further descriptive statistics on the agencies' reporting on 2023 stops are:

- 37 agencies had no traffic stops (3.7%)
- 2.3% of agencies collected stops data for less than a year ("incomplete"), similar to 2022.
- 15.8% of agencies had stops but did not submit any stops data ("Non-compliant"), which is a decrease from 18.7% in 2022.

Table 2. Agency status on reporting. Illinois, all agencies, Traffic stops, 2022 and 2023.

Status of Agency	2022		2023	
	Number of agencies	Percent of agencies	Number of agencies	Percent of agencies
Complete reporting ^a	793	78.9%	779	78.1%
Zero stops ^b	24	2.4%	37	3.7%
Incomplete ^c	21	2.1%	23	2.3%
Non-compliant ^d	188	18.7%	158	15.8%
All agencies combined	1,005	100%	997	100%

^aAgency with one or more stops that were completely reported.
^bAgency performed no stops over the year.
^cAgency submitted some but not all of their stops for the year.

³ Ghinai I, McPherson TD, Hunter JC, et al. First known person-to-person transmission of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) in the USA. *Lancet*. 2020;395(10230):1137-1144. doi:10.1016/S0140-6736(20)30607-3

⁴ Chicago Tribune. Mar 13, 2020. *Governor cancels Illinois schools statewide until March 30 to slow the spread of coronavirus.*

⁵ Chicago Channel 5 website. Published March 20, 2020. Updated on March 20, 2020, at 10:42 pm. *Illinois Governor Issues Stay-at-Home Order*. Accessed on June 1, 2021, at <https://www.nbcchicago.com/news/local/illinois-governor-expected-to-issue-stay-at-home-order-sources/2241118/>

^dAgency made stops, but no stops data was submitted.

Number of stops

The total number of reported traffic stops in 2023 was 2,260,647. The number of stops per agency was generally substantial. Hundreds of agencies (about 76%) had more than 100 stops during 2023 (Table 3).

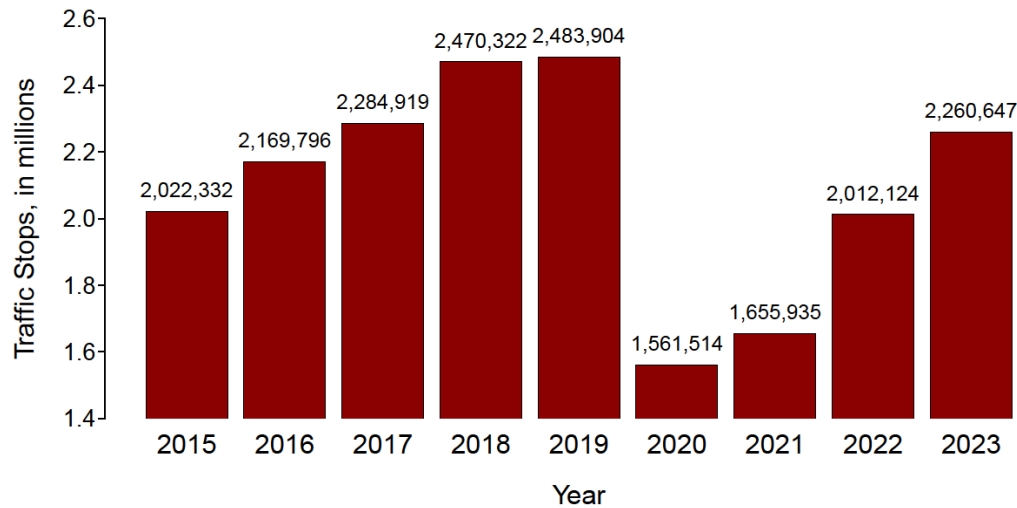
Table 3. Number of Traffic stops for agencies with at least one stop. Illinois, all agencies, Traffic stops, 2022 and 2023.

Number of stops	2022		2023	
	Number of agencies	Percent of agencies	Number of agencies	Percent of agencies
1-10	55	6.9%	59	7.4
11-100	138	17.4%	134	16.7
101-1,000	299	37.7%	288	35.9
1,001-10,000	282	35.6%	301	37.5
10,001-100,000	17	2.1%	18	2.2
More than 100,000	2	0.3%	2	0.2
All compliant agencies with ≥ 1 stop	793	100%	802	100%
Notes:				
(1) Includes only agencies with at least one stop and includes all agencies with either complete or incomplete reporting of 2023 stops.				
(2) Chicago Police: 511,738 in 2022; 535,088 in 2023. (Chicago is also represented in the Table above).				

Stops that were reported with missing information about the race of the driver were excluded from this report and were not considered “reported stops.” In 2022 there were 58 such stops, and in 2023 there were 78 such stops.

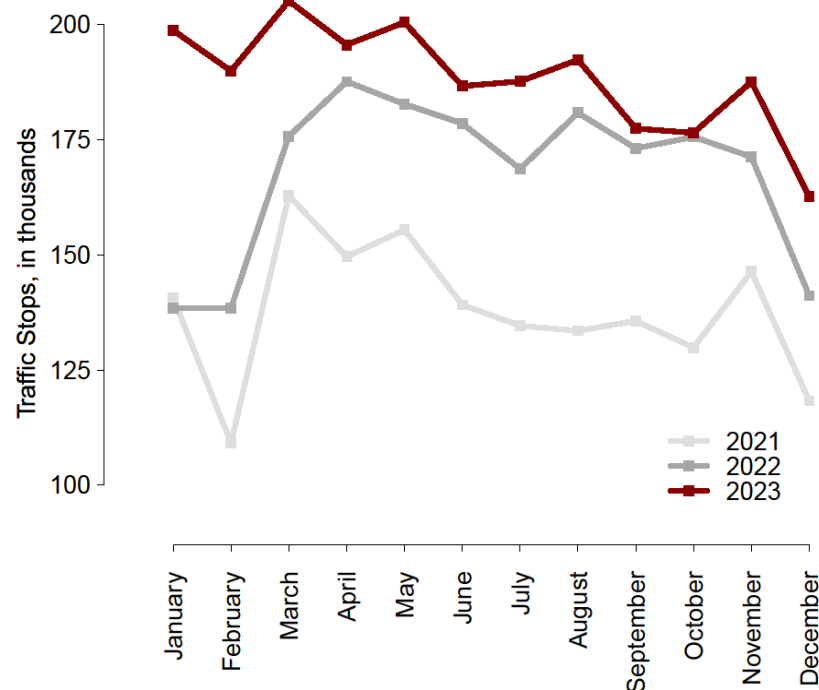
The number of reported stops per year has grown each year since 2015 (Figure 1a) until there was a sharp decrease in 2020, due to COVID-19. There was a 23% increase in the number of stops reported to IDOT from 2015 to 2019; in 2020, the number of reported stops sharply decreased 37% from 2019. In 2021, this number increased a moderate 6% from 2020. In 2022, it increased a notable 22% from 2021. In 2023, the number increased 12.4% from 2021 and nearly returned to its 2017 value.

Figure 1a. Illinois, number of traffic stops, 2015-2023.



The monthly pattern of stops reveals that the number of stops remained strong throughout the whole of 2023 (Figure 1b). In 2023, unlike in 2021-2022, January and February did not have notably fewer stops than the few following months. Since 2021, there is a year-to-year gradual increase of stop counts within each individual month of the year (except January 2021 to January 2022).

Figure 1b. Illinois, number of Traffic stops per month, 2021 (light gray line), 2022 (gray line), and 2023 (dark red line).

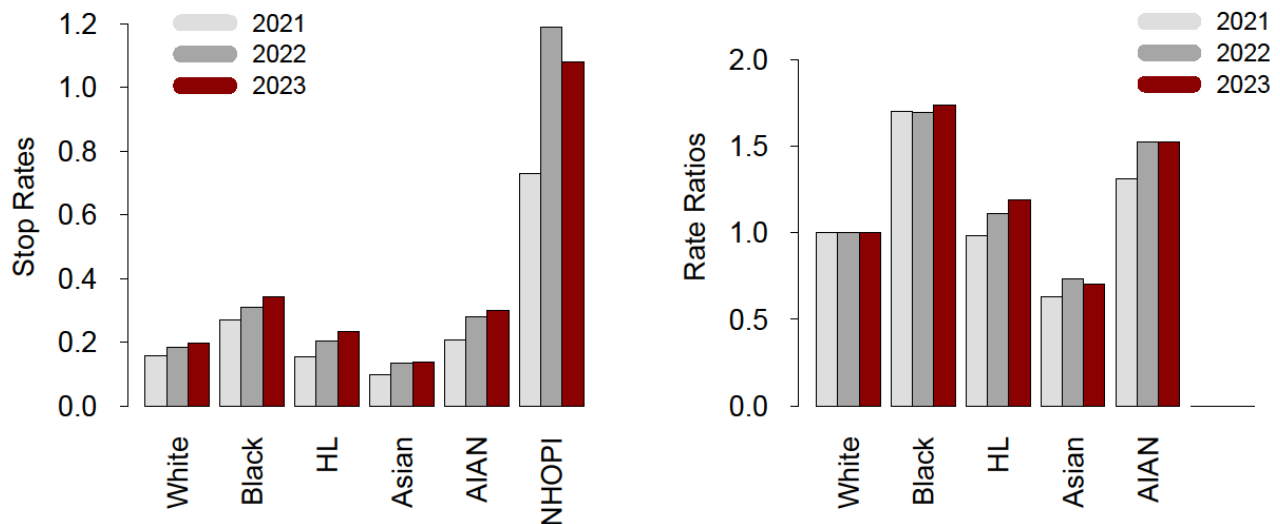


Statewide stop rates and rate ratios

The statewide stop rates are diverse among the six racial groups (Figure 2, left panel). Of interest, the smallest minority group (Native Hawaiian or Other Pacific Islander) had the highest stop rates. This is a potential anomaly due to a still-persisting mismatch between the officer-identified race of stopped individuals and the self-identified race reported in the U.S. census survey data, which is used as part of the benchmark calculations in this study. Also, stops rates for the rest of the racial groups have steadily increased from 2021 to 2023, likely the result of increased number of stops.

The statewide stop rate ratios seem fairly constant within the last three years, 2021-2023. Asian drivers have their rate ratio less than 1, Black and AIAN drivers larger than 1, and Hispanic or Latino drivers are close to 1 with a somewhat increasing trend. Rate ratio for NHOPI group is not shown in the figure, being too high to show on this scale.

Figure 2. Stop rates (left panel) and rate ratios (right panel) for each racial group, 2021 (light gray bars), 2022 (gray bars), and 2023 (dark red bars). Illinois, Traffic stops, 2021-2023.



Abbreviations for racial groups: Black = “Black or African American”, HL = “Hispanic or Latino”, AIAN = “American Indian or Alaska Native”, NHOPI = “Native Hawaiian or Other Pacific Islander”.

Multiple stopping of individual drivers

This report introduces a new descriptive statistic: the number of times each stopped individual driver was stopped. All stopped drivers were first grouped according to their race. Next, proportions were calculated, within each group, of drivers stopped exactly once during 2023, stopped 2-3 times, 4-10 times, and more than 10 times. In each racial group these proportions sum up to 100%.

Individual drivers were recognized in the data by their unique combinations of name, year of birth, ZIP code of residence and gender. Some amount of data cleaning was performed on officer-recorded names so that the most frequent patterns in the way drivers’ names are entered into the dataset were captured. By these adjustments, “John Doe”, “Doe, John”, “John L. Doe Junior”, etc., were recognized as

the name of a single driver. Note that handling names in this way did not affect the officer-recorded race of the driver in any way. There are remaining instances of an individual name being written in several nonstandard ways so that the algorithm fails to recognize all these names as belonging to the same driver. Thus, multiple stops are somewhat more prevalent in the data than what was detected in this analysis, and more sophisticated name-handling techniques would capture more name matches. This analysis recognized 1,700,575 individual drivers whose race was recorded in at least one stop. If an individual driver was assigned different races in different stops, their race was set as their most frequent race assignment (in the case of a tie, a random selection between several most frequent assignments was made).

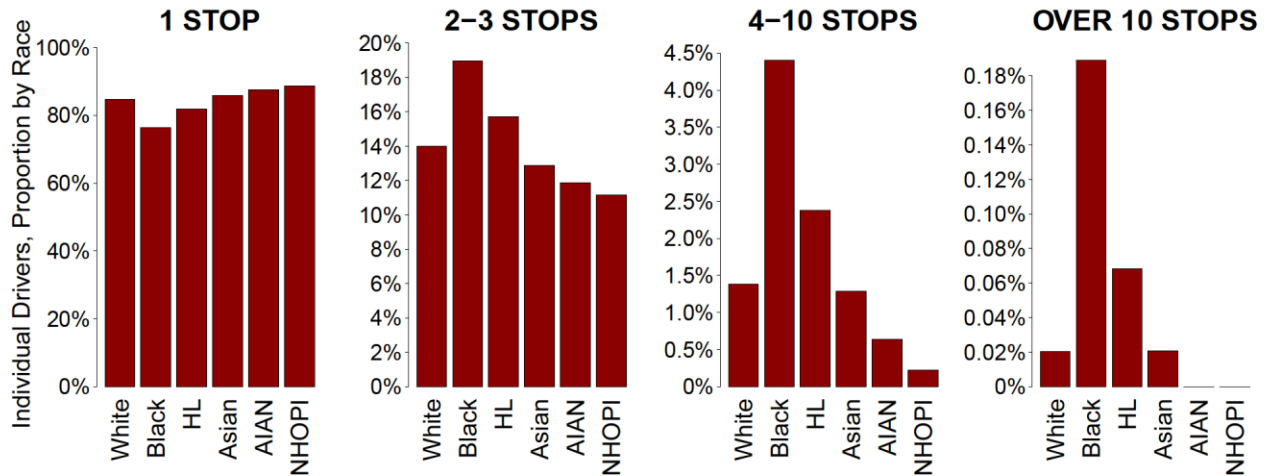
A summary finding is that 81.9% of the individual drivers were stopped exactly once, 15.6% were stopped 2-3 times, 2.4% were stopped 3-10 times, and 0.07% (1,300 drivers) were stopped over 10 times. More detailed results are shown in Figure 3. The reader should keep in mind that these stopped drivers are not fully representative of their driver source populations, because this analysis is only about the drivers who have been stopped at least once. Stopped drivers may not well represent all drivers, a large fraction of whom were not stopped at all during 2023.

With this in mind, Black drivers clearly stand out as the racial group whose stopped individual members had the highest occurrence of being stopped multiple times.

Compared to an average (stopped) white driver, an average (stopped) Black driver had a 36% higher chance of having been stopped 2-3 times, 3 times higher chance of having been stopped 4-10 times, and 9 times higher chance of having been stopped more than 10 times. To illustrate the stops comparison from another perspective, in 2023, although estimated Black drivers statewide population (1,931,447) was 2.7 times smaller than the estimated White drivers population (5,217,253), the number of individual Black drivers stopped more than 10 times (865) was 5.1 times larger than the number of individual white drivers stopped more than 10 times (171).

This analysis was partially motivated by the interviews with police officers (see section VIII of this report). Some officers stated that they may seek specific vehicles or behaviors, which entails recognition and/or tailing of individual drivers and, potentially, their multiple stopping throughout the year. The analysis suggests that this practice may indirectly involve a racial aspect.

Figure 3. Proportion of individual drivers stopped a particular number of times, among all stopped drivers of a particular racial group. First panel is drivers stopped exactly once, second panel is drivers stopped 2-3 times, third panel is drivers stopped 4-10 times, fourth panel is drivers stopped over 10 times. Illinois, Traffic stops, 2023.



Abbreviations for racial groups: Black = “Black or African American”, HL = “Hispanic or Latino”, AIAN = “American Indian or Alaska Native”, NHOPI = “Native Hawaiian or Other Pacific Islander”.

The analysis of multiple stops of individual drivers also suggests a test of the idealized view of officers perfectly estimating race of stopped drivers. If this were correct, a single driver would always be assigned a single race on each occasion of being stopped. Exception to this could be drivers who belong to more than one race: they could be legitimately assigned different races on different occasions, since the data collection form does not contain a “more than one race” entry.

Some 314,224 individual drivers were detected who were stopped more than once and whose race was recorded by officers on more than one occasion. These drivers were in a unique position to be potentially classified into more than one race group. Table 4 gives the distribution of these drivers according to how many different race groups they were assigned across their multiple stops.

Table 4. Distribution of drivers whose race was officer-assigned more than once, according to how many different race groups they were assigned on at least one occasion. Illinois, Traffic stops, 2023.

All drivers with officer-assigned race more than once	Assigned to 1 race group	Assigned to 2 race groups	Assigned to 3 race groups	Assigned to 4 race groups	Assigned to 5 race groups	Assigned to 6 race groups
314,224 (100%)	274,644 (87%)	37,843 (12%)	1,645 (0.52%)	83 (0.03%)	7 (0.00%)	2 (0.00%)

One out of every eight drivers (12.6%) with multiple opportunities for a race assignment were assigned more than one race, and one out of every 180 drivers (0.6%) were assigned three or more different races. The nine drivers (two rightmost cells in Table 4) that were assigned nearly all possible race groups were inspected more closely. Nearly all of their stops were reported by different individual officers.

The 2020 Census shows that 8.9% of the Illinois population has more than one race. Since drivers with multiple stops do not represent perfectly their racial populations of the whole state, it can be concluded that 12.6% of all stopped drivers being assigned more than one race is consistent with an interpretation that these are mainly drivers who self-identify with more than one race.

Distribution of stop rate ratios

Table 5.a shows the numbers of comparisons of stops rates of a minority racial group and whites carried out in the traffic stops study. Any comparison yields a rate ratio — the minority stop rate divided by the white stop rate. Each agency might contribute up to five such comparisons (five minority groups, each compared to whites on their stop rates). For this analysis, there were fewer than five comparisons when white drivers had zero stops or when a benchmark population value was zero for either a minority racial group or whites, thus making some comparison rate ratios numerically undefined.

The first column under “A” in Table 5.a illustrates all comparisons: each minority/white rate ratio from each agency has been compiled across all agencies. Table 5.a then categorizes the rate ratios by their magnitude and shows the percentage distribution across categories. The columns under “B” restricts the comparisons to those based on at least 50 white stops and 50 stops of the minority group compared. The 50 stops would provide a more precise rate ratio than a smaller number of stops. The large percentage of stops in the category “<0.25” in panel A for both 2022 and 2023 is due to the presence of many small agencies that have a small number of stops and zero stops for one or more minorities.

There is a drastic reduction — more than four-fold from Panel A to Panel B — in the total number of rate ratios, from 3,999 (all comparisons) down to 958 (more precise comparisons). From the more precise comparisons (Panel B, based on 50 or more stops of whites and 50 or more stops of the minority group compared) it is estimated that in 78.3% of these rate ratios, minority drivers were stopped at a higher rate than white drivers (rate ratio > 1). This suggests (but does not prove) that racial profiling was a factor in a number of traffic stops.

The overall distribution of rate ratios seems rather similar in 2022 and 2023. The 95% confidence intervals provided in the tables of Part II should be used as a guide to the precision of rates, percentages and rate ratios when interpreting the numeric results for a specific agency.

Table 5.a Distribution of stop rate ratios. (Each nonwhite racial group compared to whites for an agency). Illinois, Traffic stops, 2022 and 2023.

A. All agencies and racial groups*			B. Agencies and racial groups with at least 50 stops**	
Stop rate ratios	2022	2023	2022	2023
<0.25	35.0%	32.8%	1.2%	0.9%
0.25 to <0.5	8.0%	8.1%	4.6%	4.1%
0.5 to <1.0	14.0%	14.4%	17.8%	16.7%
1.0 to <2.0	18.5%	18.1%	33.6%	35.2%
2.0 to <4.0	14.6%	15.7%	32.2%	33.0%
≥4.0	9.9%	10.9%	10.5%	10.1%
All ratios***	100%	100%	100%	100%

* All comparisons of whites and a racial group for all agencies. Excludes ratios from agencies with zero stops of white drivers or a benchmark population value of zero for either a minority group or whites.

** All comparisons of whites and a racial group for all agencies; all comparisons must have at least 50 stops of whites and 50 stops of the compared racial group. Excludes undefined rate ratios, or where either whites or the compared racial group have less than 50 stops.

***The number of ratios that were included in the analysis in column A and B respectively, were 3,940 and 887 in 2022; 3,999 and 958 in 2023. Each ratio involves a comparison of one nonwhite racial group vs. whites for one agency.

Table 5.b shows the distribution of stop rate ratios in 2023 among the three most populous minority groups. Since each agency provides only a single stop rate ratio for a single minority group, a proportion of stop ratios equates to a proportion of agencies. From the more precise comparisons (Panel B, based on agencies with more stops) it is estimated that in 94.9% of agencies with at least 50 stops for both whites and Blacks, Black drivers are stopped at a higher rate than white drivers (rate ratio > 1). For Hispanic drivers, this value is 80.7%. Similar to the note on Table 5.a, this suggests (as a possibility but does not prove) that racial profiling was a factor in a number of traffic stops. This finding does not occur among stopped Asian drivers, who are stopped at a higher rate than White drivers in only 25.5% of agencies with at least 50 stops for both whites and Asians.

Table 5.b Distribution of stop rate ratios for Black, Hispanic and Asian drivers. (Each noted nonwhite racial group compared to whites for an agency). Illinois, Traffic stops, 2023.

A. All agencies and racial groups				B. Agencies and racial groups with at least 50 stops*		
Stop rate ratios	Black	Hispanic	Asian	Black	Hispanic	Asian
<0.25	10.5%	16.3%	36.6%	0	1.7%	1.9%
0.25 to <0.5	4.9%	6.5%	19.6%	0.5%	2.9%	16.8%
0.5 to <1.0	12.3%	19.1%	25.9%	4.6%	14.7%	55.9%
1.0 to <2.0	23.4%	35.9%	11.6%	25.6%	54.9%	23.6%
2.0 to <4.0	35.8%	18.4%	3.5%	53.4%	23.3%	1.9%
≥4.0	13.3%	3.9%	2.8%	15.9%	2.6%	0
All ratios	100%	100%	100%	100%	100%	100%

*All comparisons of whites and a racial group for all agencies; all comparisons must have at least 50 stops of whites and 50 stops of the compared racial group. Excludes undefined rate ratios, or where either whites or the compared racial group have less than 50 stops.

**The number of ratios that were included in the analysis in column A was 800 for Black, 800 for Hispanic, and 800 for Asian group; in column B this was 414 for Black, 348 for Hispanic, and 161 for Asian group. Each ratio involves a comparison of one nonwhite racial group vs. whites for one agency.

Table 5.c shows the distribution of citation ratios among the three minority groups, and all the racial groups collectively in 2023. A citation is the most severe outcome among the three outcomes noted on the data collection form: verbal warning, written warning and citation. It is estimated that in 74.6% of all agencies with at least 50 stops for both whites and Blacks, Black drivers are getting citations at a higher rate than white drivers (citation ratio > 1). For Hispanic drivers, this value is 86.7%. Similar to the note on Table 5.a, this suggests (but does not prove) that racial profiling was a factor in a number of citations. This finding does not occur among Asian drivers, whose citation rate is higher than among white drivers in only 41.4% of all agencies with at least 50 stops for both whites and Asians. Overall, in 72.0% of all citation ratios minority drivers are receiving citations at a higher rate than white drivers.

Table 5.c Distribution of citation ratios. (Each ratio that enters into the computation involves each noted nonwhite racial group compared to whites for an agency). Illinois, Traffic stops, 2023.

Citation rate ratios*	Black	Hispanic	Asian	All racial groups
<0.25	0	0	1.2%	0.3%
0.25 to <0.5	0.5%	0.9%	1.2%	1.4%
0.5 to <1.0	24.9%	12.4%	56.2%	26.3%
1.0 to <2.0	72.4%	84.4%	41.4%	70.2%
2.0 to <4.0	2.2%	2.3%	0	1.8%
≥4.0	0	0	0	0
All ratios**	100%	100%	100%	100%
<p>*All comparisons of whites and a racial group for all agencies; all comparisons must have at least 50 stops of whites and 50 stops of the compared racial group. Excludes undefined ratios, or ratios where either whites or the compared racial group have less than 50 stops.</p> <p>**The number of ratios that were included in the analysis for 2023 stops is 957. Each ratio that enters into the computation involves a comparison of one nonwhite racial group to whites for one agency.</p>				

Table 5.d shows the distribution of contraband-found ratios in vehicle searches among the three more populous minority groups, and all the racial groups collectively in 2023. It is estimated that in 61% of all agencies with at least 50 stops for both whites and Blacks, contraband is found in Black drivers' vehicle searches at a higher rate than in White drivers (ratio > 1). For Hispanic drivers, this value is 40.5%, for Asian drivers it is 30.1%, and the overall percentage for all racial groups is 48.4%. This result does not suggest a presence of racial profiling related to the contraband aspect of traffic stops.

Table 5.d Distribution of contraband found ratios in vehicle searches. (Each ratio that enters into the computation involves each noted nonwhite racial group compared to whites for an agency). Illinois, Traffic stops, 2023.

Contraband rate ratios*	Black	Hispanic	Asian	All racial groups
<0.25	7.3%	8.6%	39.8%	12.5%
0.25 to <0.5	3.8%	7.9%	4.9%	5.5%
0.5 to <1.0	27.9%	43.0%	25.2%	33.6%
1.0 to <2.0	52.9%	35.5%	22.3%	41.4%
2.0 to <4.0	7.0%	3.6%	7.8%	5.9%
≥4.0	1.2%	1.4%	0	1.1%
All ratios**	100%	100%	100%	100%
<p>*All comparisons of whites and a racial group for all agencies; all comparisons must have at least 50 stops of whites and 50 stops of the compared racial group. Excludes undefined ratios, or ratios where either whites or the compared racial group have less than 50 stops.</p> <p>**The number of ratios that were included in the analysis for 2023 stops is 742. Each ratio that enters into the computation involves a comparison of one non-white racial group to whites for one agency.</p>				

Table 5.e shows the distribution of contraband found ratios in searches of individual drivers or passengers among three minority groups individually, and all the racial groups collectively in 2023. It is estimated that in 38.9% of all agencies with at least 50 stops for both whites and Blacks, contraband is found while searching Black drivers or their passengers at a higher rate than in white drivers or their passengers (ratio > 1). For Hispanic drivers or their passengers, this number is 25.3%, for Asian drivers it is 20.5%, and the overall percentage for all racial groups is 30.6%. This result does not suggest a presence of racial profiling related to this aspect of traffic stops.

Table 5e. Distribution of contraband found ratios from searches of individuals: driver or passengers. (Each ratio that enters into the computation involves each noted nonwhite racial group compared to whites for an agency). Illinois, Traffic stops, 2023.

Contraband rate ratios*	Black	Hispanic	Asian	All Minority racial groups
<0.25	25.6%	38.2%	74.4%	38.1%
0.25 to <0.5	8.1%	9.7%	1.3%	7.8%
0.5 to <1.0	27.4%	26.7%	3.8%	23.5%
1.0 to <2.0	23.3%	18.9%	3.8%	18.7%
2.0 to <4.0	12.6%	6.0%	6.4%	9.0%
≥4.0	3.0%	0.5%	10.3%	2.9%
All ratios**	100%	100%	100%	100%
<p>*All comparisons of whites and a racial group for all agencies; all comparisons must have at least 50 stops of whites and 50 stops of the compared racial group. Excludes undefined ratios, or ratios where either whites or the compared racial group have less than 50 stops.</p> <p>**The number of ratios that were included in the analysis for 2023 stops is 578. Each ratio that enters into the computation involves a comparison of one nonwhite racial group to whites for one agency.</p>				

Reason for Stop

The reason for each stop is summarized in Figure 3a. The percentage of stops for each reason varied substantially by racial group (Figure 3b). As a side note, “Commercial Vehicle” is not a reason to be stopped. Commercial vehicles have a different set of regulations/violations that may not apply to passenger vehicles. Therefore, commercial vehicles have unique reasons for being stopped, such as weight overages and unsecured loads.

Figure 3a. Percentage of stops by reason for stop. Illinois, Traffic stops, 2023.

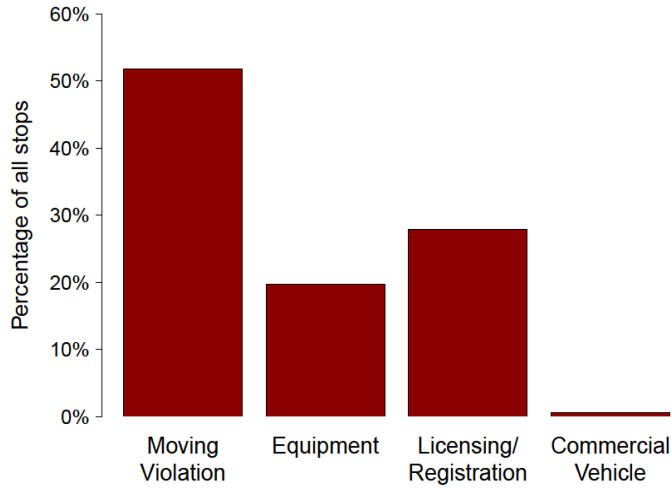
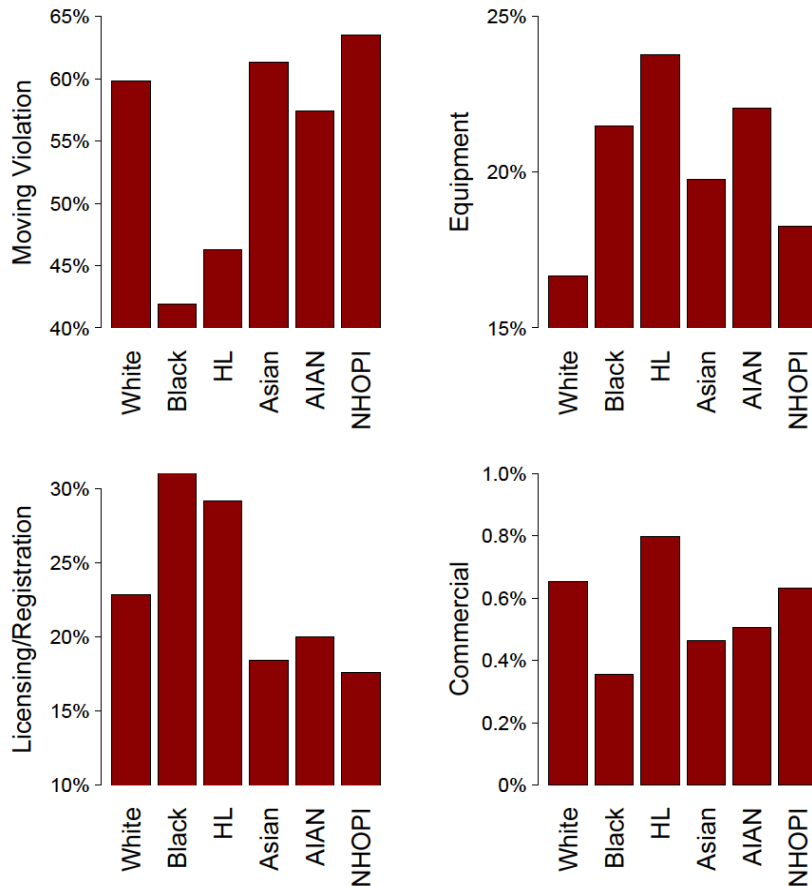


Figure 3b. Percentage of stops for the noted reason, by race. For each race, the percentages sum to 100% across the four noted reasons. Note that the upper and lower limits of the y-axis vary across the four panels. Illinois, Traffic stops, 2023.

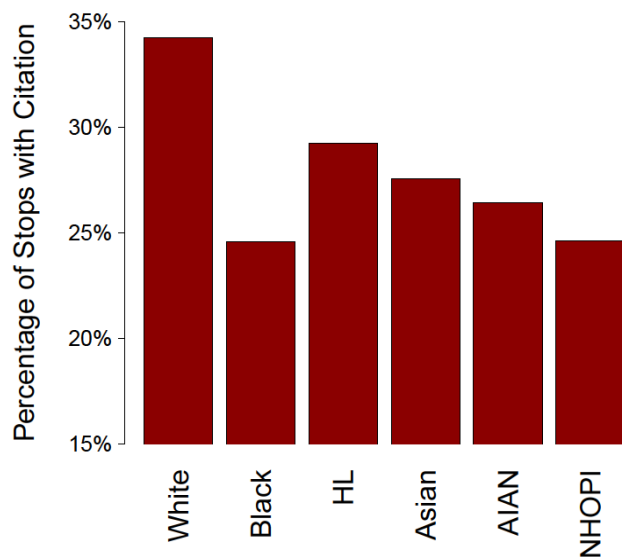


Abbreviations for racial groups: Black = “Black or African American”, HL = “Hispanic or Latino”, AIAN = “American Indian or Alaska Native”, NHOPI = “Native Hawaiian or Other Pacific Islander”.

Outcome of Stop: Citation

Similar to the results in Figure 3b, the six racial groups have diverse percentages receiving a citation as the outcome of the stop (Figure 4). “Citation” is the most serious result of the three outcomes recorded on the traffic stop data collection form: citation, written warning or verbal warning/stop card.

Figure 4. Percentage of stops with a citation, by race. Illinois, Traffic stops, 2023.

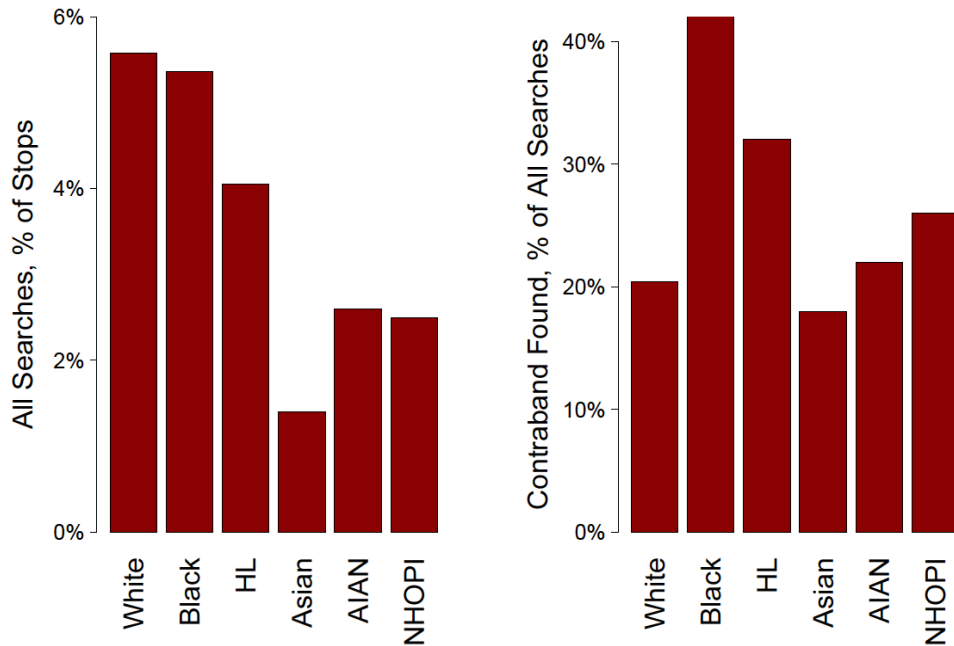


Abbreviations for racial groups: Black = “Black or African American”, HL = “Hispanic or Latino”, AIAN = “American Indian or Alaska Native”, NHOPI = “Native Hawaiian or Other Pacific Islander”.

Searches

Figure 5a shows that the vehicle search rate was moderately low for all of the racial groups (approximately 2%-6% of stops, left panel), but given a vehicle search, the contraband yield was not low (18%-44% of searches, right panel). As noted for other figures, there is variation among the races’ percentages in both panels.

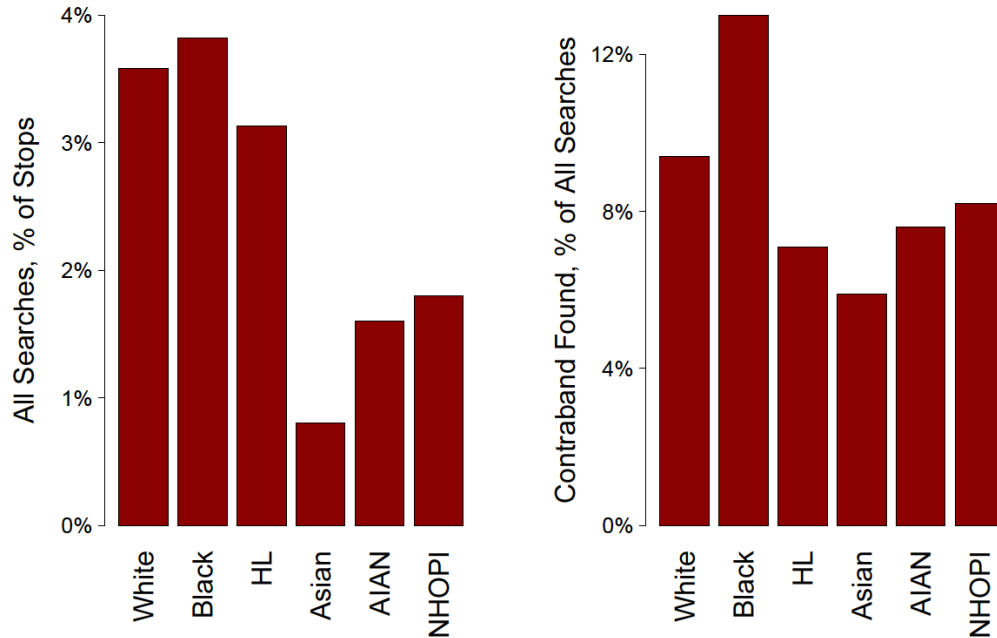
Figure 5a. Percentage of stops with vehicle searches; percentages of vehicle searches with Contraband Found, by race. Note that the upper limits of the vertical axis vary across the two panels. Illinois, Traffic stops, 2023.



Abbreviations for racial groups: Black = “Black or African American”, HL = “Hispanic or Latino”, AIAN = “American Indian or Alaska Native”, NHOPI = “Native Hawaiian or Other Pacific Islander”.

Figure 5b shows that the driver or passenger search rate (searching an individual) was low for all of the racial groups (approximately 1%-4% of stops, left panel), and given a driver or passenger search, the contraband yield was somewhat higher (6%-13% of searches, right panel). As noted for other figures, there is variation among the races’ percentages in both panels.

Figure 5b. Percentage of stops with driver or passenger searches; percentages of vehicle searches with Contraband Found, by race. Note that the upper limits of the vertical axis vary across the two panels. Illinois, Traffic stops, 2023.



Abbreviations for racial groups: Black = “Black or African American”, HL = “Hispanic or Latino”, AIAN = “American Indian or Alaska Native”, NHOPI = “Native Hawaiian or Other Pacific Islander”.

Dog Sniffs

While there were 4,969 dog sniffs performed statewide in 2023 (33% increase from 3,729 dog sniffs in 2022), it was still relatively rare compared to the total number of stops by Illinois law enforcement agencies. Only one in 455 stops in 2023 had a dog sniff. Not all agencies conduct dog sniffs, because the trained dogs are not available in each agency. While the frequency of dog sniffs is low statewide (0.02%-0.28% of stops across the six racial groups), the finding of contraband following a vehicle search after a dog sniff is substantial, 35%-63% of vehicle searches across the four racial groups, excluding the American Indian and Native Hawaiian groups having too few stops for this comparison. These two groups have very small numbers of stops with dog sniffs (14 and 1, respectively) to be reliable for more detailed contrasts.

Table 6. Number of stops with a dog sniff and their percentage among all stops. Given that a dog sniff occurred, number and percentage of stops with contraband found. Illinois, Traffic stops, 2023.

Racial Group	Stops with Dog Sniff		Contraband Found	
	Number	Percentage of stops	Number	Percentage of vehicle searches*
White	2,857	0.28%	1,330	60.8%
Black or African American	1,253	0.19%	542	63.5%
Hispanic or Latino	755	0.16%	200	41.4%
Asian	89	0.11%	23	35.4%
American Indian or Alaska Native	14	0.14%	1	12.5%
Native Hawaiian or Other Pacific Islander	1	0.02%	0	0
All groups combined	4,969	0.22%	1,646	58.3%
*The vehicle search occurred after a dog sniff.				

Officer-assigned drivers race analysis

The officer fills out a data collection form, which includes the officer’s choice as to the race of the driver. This choice may not always be correct, and that might affect the reported rate ratios. This section presents an exploratory analysis of a possible error in the officer’s assigning a race to the stopped driver.

The readers of this report should be clear that this work is both exploratory and self-contained. The officer-assigned driver race is never actually changed when calculating and presenting anything outside this section of the report. When calculating statistics for Part II (extensive tables), the race chosen by the officer is always retained and used in the calculations of stop rates, rate ratios and other statistics.

In the previous report (on 2022 stops), a way to statistically analyze drivers’ race as assigned by the officer was introduced, looking for potential signs of race misclassification and the effect this could have on stop rate ratios.

For that purpose, Bayesian Improved Surname Geocoding (BISG) was employed, a statistical methodology commonly used in social sciences that estimates the race of an individual based on their first name, last name and ZIP code. It uses data the U.S. Census produced in the 2010 Census Surname Table, which lists the most common surnames and the associated self-reported races and Hispanic origin for each name.¹⁻⁶ For more technical details, see last year’s report, section VI.

Argyle and Barber⁶ recently found that BISG would relatively rarely, about 7%-8% of the time, misclassify a factually white driver as being nonwhite. This particular aspect of the method was chosen to create a comparison between two ways of assigning race: as done by the officer and as done by the BISG

algorithm. If the race assigned by the officer was perfectly accurate, it would be expected to have similar 7%-8% of white drivers misclassified by BISG as minority drivers.

Rate ratios are particularly sensitive to factually white drivers being misclassified into minority groups. Since white drivers are the reference group, each factually white driver misclassified as a minority driver increases rate ratios of all minority groups by decreasing the denominator in those ratios.

Before doing any analysis, approximately 3% of the total stops were removed due to typos and formatting errors in the driver’s name entry. Asian and Native Hawaiian or Other Pacific Islander drivers were grouped into a single racial group. See last year’s report for more details.

In one approach, all traffic stops were used. Another approach used only those stops where BISG was “highly confident” in its own estimate of a race, as BISG always gives a probability that its own estimate is correct. “Highly confident” here means that BISG assigned 95% or higher probability to its own estimate of a race. In these, so called “high-probability” stops, the combination of driver’s name, surname and ZIP code alone suggested very strongly the race of the driver: if a race in a high-probability stop is assigned by the officer differently from BISG, the possibility of officer’s error is heightened. The analysis was limited to high-probability stops to be conservative, that is, to address only the cases where the two race assignments could be least expected to differ.

The results are summarized in Table 7. Using all stops, BISG classified 16.1% of officer-assigned white drivers as minority drivers. That is twice the expected value of 7%-8% which suggests that, overall, officer race designation is not perfect. Even among the high-probability stops, where the differences were expected to happen least frequently, BISG classified 9.1% of officer-reported white drivers as minority drivers.

In those high-probability stops where an officer-designated white driver is classified by BISG as being a minority driver, that minority is by far most frequently Hispanic/Latino (four times more frequently than being API and 17 time more frequently than being Black).

Table 7. Distribution of stops with drivers that officer-assigned as white, across BISG-assigned racial categories. API = ‘Asian or Native Hawaiian or Other Pacific Islander’. Illinois, Traffic stops, 2023.

	BISG-assigned driver’s race					
	White	Black	Hispanic/ Latino	API	AIAN	All Minority
All stops having a white driver (officer-assigned)	835,108 (83.9%)	29,755 (3.0%)	80,507 (8.1%)	49,388 (5.0%)	118 (0.0%)	159,768 (16.1%)
High-probability stops having a white driver (officer-assigned)	558,517 (90.9%)	2,549 (0.4%)	40,905 (6.7%)	12,450 (2.0%)	9 (0.0%)	55,913 (9.1%)

Next, individual agencies were analyzed, using all stops. The goal was to observe how different would rate ratios be if BISG would re-assign races—but in a conservative manner: only if BISG was highly confident (the 95% value, note above) in its own race designation, that designation would be accepted. Otherwise, the driver’s race would remain as assigned by the officer.

Here 254 agencies were selected that reported at least 100 traffic stops, and at least 20 stops of each racial group: white, Black, Hispanic/Latino and API. The AIAN group was excluded from the analysis due to having too few stops. Races were then re-assigned according to the BISG designation, conservatively, as described above. Thus, each of the 254 agencies provided three newly calculated rate ratios (each of Black, Hispanic/Latino, API) vs white. The new values of these ratios were compared against their reported values that were calculated using the original officer-assigned race. Agencies were then categorized according to how much their rate ratios changed. These findings are summarized in Table 8.

Table 8. Counts of 254 agencies categorized according to how different their rate ratios become when BISG conservatively re-assigns drivers’ race, relative to their reported rate ratios with the original officer-assigned driver’s race. API = ‘Asian or Native Hawaiian or Other Pacific Islander’. Illinois, Traffic stops, 2023.

Stop Rate Ratio vs White:	How different is a rate ratio when BISG conservatively re-assigns races, relative to its reported value?				
	50%-100% of reported value	100%-150% of reported value	150%-200% of reported value	200%-300% of reported value	over 300% of reported value
Black (254 ratios)	179	70	3	2	0
Hispanic/Latino (254 ratios)	28	202	9	9	6
API (254 ratios)	42	175	26	10	1

In this approach, the officer-assigned and BISG conservatively re-assigned races show that 696 out of 762 rate ratios (91.3%) differed by less than 50% in value (two leftmost columns of table 8, marked with thick border). However, there are some cases where rate ratios did notably differ. There were 28 instances where rate ratios increased more than twice (two rightmost columns of table 8) when BISG re-assigned the driver’s race (3.7% of all ratios). In 15 agencies, Hispanic/Latino to white ratios increased more than twice, in 11 agencies API to white ratio increased more than twice, and in 2 agencies Black to white ratio increased more than twice. These numbers would be larger if the approach was less conservative.

Interestingly, most Black vs White rate ratios would be lowered with BISG re-assigned race. Overall, the issue of potential race misclassification seems relevant mainly for Hispanic/Latino and API drivers.

In the future, this aspect of traffic stops may continue to be studied.

References (for race analysis section)

1. Tzioumis, K. (2018) Demographic Aspects of First Names. *Sci Data* **5**, 180025. <https://doi.org/10.1038/sdata.2018.25>.
2. Haas A, Adams JL, Haviland AM, et al. (2022). The Contribution of First-name Information to the Accuracy of Racial-and-Ethnic Imputations Varies by Sex and Race-and-Ethnicity Among Medicare Beneficiaries. *Medical Care*, 60(8):556-562.
3. Elliott MN, Morrison PA, Fremont A, et al. (2009) Using the Census Bureau's surname list to improve estimates of race/ethnicity and associated disparities. *Health Serv Outcomes Res Method*, 9(2):69–83
4. Voicu I. (2018) Using first name information to improve race and ethnicity classification. *Statistics and Public Policy*, 5(1):1-13.
5. Luh E. (2022) Not So Black and White: Uncovering Racial Bias from Systematically Misreported Trooper Reports. *SSRN*. <http://dx.doi.org/10.2139/ssrn.3357063>.
6. Argyle, Lisa and Michael Barber "Misclassification and Bias in the Predictions of Individual Ethnicity from Administrative Records." *American Political Science Review*, Volume 118, Issue 2, May 2024, pp. 1058 – 1066.

VII. Considerations for Interpreting the Data

A considerable number of agencies have a relatively small number of stops for one or more of the racial groups. The limited stop counts yield a wide 95% confidence interval, which means high uncertainty in the corresponding rate, percentage, or ratio. The uncertainty from potential benchmark issues (discussed earlier) or race classification issues (also discussed earlier) add to the uncertainty implied by the confidence intervals. Any investigation of racial profiling that is initiated based on this report should consider the confidence intervals and other sources of uncertainty.

In Part II of this report (agency tables) each agency has ratios of rates or ratios of percentages. Some of them are bolded as a "statistical deviation." The bolded ratios and their meaning and interpretation are topics covered elsewhere in this report. In addition to whether or not a ratio is bolded, the absolute magnitude of the ratio should be considered when interpreting the results, as discussed earlier.

If a ratio is not bolded, it does not prove that there is no racial profiling in the agency. It is worth looking at the upper and lower bound of the 95% confidence interval to see what the uncertainty is. That interval quantifies the uncertainty and shows the largest ratio and the smallest ratio that are reasonably plausible, given the data.

For example, consider a ratio of **1.0** for a specific Minority percentage of stops with a search, compared to the corresponding White percentage of stops with a search — in a particular agency. The ratio of 1.0 indicates that the percentage of stops with a search was the same for both whites and for the specific minority group. However, the counts of searches are very small in this example, and the 95% confidence interval for the ratio is **0.025** up to **5.8**. (This is very similar to an actual agency result.) That is, it is plausible that the true search percentage of the minority group is anywhere from one-fortieth of the white percentage up to almost six times the white percentage.

Clearly, in a case like the one described above, it is not known enough about the ratio to draw any conclusion except that it is uncertain. Thus, a confidence interval for a ratio that includes 1.0 and is very wide (encompassing values well above the calculated ratio and also well below the ratio) usually means that presence or absence of potential racial profiling cannot be determined from the data in hand.

Lastly, while there is a considerable focus on the stop rate ratios reported in Panel 1 of the tables in Part II of this report (detailed tables), the other panels provide valuable complementary information on the outcomes of stops and how the outcome statistics compare between racial groups. As noted earlier, the stop outcome results are compared among individuals that were stopped and do not rely on any external population benchmark. This avoids some limitations of benchmarks. Ultimately, stop results for an agency should be interpreted holistically, considering all panels together; different panels may suggest different interpretations when viewed individually.

VIII. Interviews with a Sample of Illinois Officers involved in Traffic Stops

Exploring the Traffic Stop Experience

To better understand the context of traffic stops in Illinois, the study sought to collect perspectives of law enforcement officers who perform traffic stops. By working with chiefs of police in Illinois, a convenience sample of officers was gathered to pilot interview efforts with law enforcement. Ideally, citizen-based perspectives of traffic stops would be gathered also. However, due to the complexities of finding and accessing a sample of drivers, that was not achieved yet. This section covers the perspective from the officers' side of the stop. Readers may also be interested in the literature review (Section IX; Appendix E) which summarizes research articles on both officers' and drivers' stop experience.

Eight police officers in seven agencies and six counties were interviewed by telephone or Zoom between December 2023 and April 2024. Interviews lasted an average of 64 minutes. Officers were all white males; one of them also identified as Hispanic. Years of service ranged from two to 29 years. Officer quotations are shown above each narrative segment. What is presented in this section are the views, opinions and experiences of the interviewed law enforcement officers. Their opinions and statements do not necessarily reflect the views or position of IDOT or The Mountain-Whisper-Light study team.

*"A traffic stop is not just about writing tickets or warnings.
A traffic stop is created to correct behavior."*

Why Officers Make Traffic Stops

- All officers explained that probable cause is required prior to conducting any traffic stops.
 - The most common visible violations mentioned by officers that provide probable cause include speeding, unsafe lane changes, distracted driving, broken lights, illegally dark window tint, illegally modified tires or exhaust systems, unsecured loads, and expired vehicle registration tags.
 - Common violations not immediately visible that provide probable cause when officers electronically monitor license plates include revoked or suspended driver's licenses and outstanding warrants. These are arrestable offenses.
- The locations where officers patrol traffic are sometimes selected at their discretion and sometimes assigned. For example:

- When there are high rates of accidents or speeding is reported in school zones or other areas, officers will be present more often to enforce safe speeds.
- Some officers have special training such as in commercial vehicle laws or drug trafficking, so their presence is heavier in areas where those offenses may likely occur.
- Officers feel the purpose of the traffic stop is to enforce community safety. Therefore, officers often use the traffic stop as an opportunity to provide “safety education” to drivers about their violations.

“There are no such things as ‘routine’ traffic stops. Everything is unique. Everyone is different.”

Who Officers Are Stopping

- Officers whose agencies are mostly residential describe the drivers they stop as mostly residents of local communities.
- Officers who report working in areas with busy thoroughfares, commercial centers or large schools feel the majority of the drivers they stop are passing through from places outside their agencies.
- All officers stated they are rarely able to see the race or gender of drivers they stop prior to approaching the driver’s window. However, if officers are monitoring for violations related to distracted driving (cell phone usage) or seat belt usage it’s more likely they would be able to notice drivers’ races prior to the stops than for other violations.
- Several officers pointed out that although most drivers are compliant, no two traffic stops are the same because of all the variables involved in a stop are different each time.

“I’m mainly dealing with good people having a bad day.”

How Officers Determine to Warn or Cite Drivers

- All officers reported that whether a driver is issued a warning or a citation during a stop is at the discretion of the officer unless the offense is arrestable. Arrestable offenses require citations.
- Officers described a variation of ways to determine whether to warn or cite drivers:
 - Likely to issue a warning if the driver engages in discussion with the officer to explain why/how the violation occurred; likely to issue a citation when drivers are silent when addressed or non-compliant with officers’ requests.
 - Likely to issue a citation if the driver has been stopped for the same violation before but likely to warn if the driver’s record is clean.
 - One officer said he only stops drivers if he plans to issue a ticket; therefore, he limits his stops to offenses he feels are especially dangerous.

“The danger is always there just by being on the side of the roadway. When drivers don’t pull over far enough to the right, that’s just a terrifying experience.”

Emotions of the Job

- For most officers interviewed, performing traffic stops makes them feel in danger because they are stepping out of their vehicles onto active roadways and risk being struck by a passing vehicle.
- All officers reported that any on-the-job fears or stresses do not carry over to home life; several officers admitted that managing their emotions gets easier over time. Some officers said that it helps to talk out their concerns with other officers before going home, and their agencies offer counselors if needed; some rely on faith.
- Officers described how some drivers are disrespectful when they are stopped and will call the officers names, shout or swear at them. Officers report being trained to remain calm and learn over time to “get a little numb to the maltreatment.”

Officer Training

- All officers were confident in the intensity, frequency and quality of their current training related to traffic stops. Several felt their training activities have improved in quality over time.

*“You gotta go beyond the numbers.
Numbers don’t tell the whole story.”*

Officers’ Commentary on Racial Profiling and Racism in Law Enforcement

- All officers interviewed felt confident there is no intentional racial profiling or racism practiced by them or other officers in their agencies due to extensive training and their respect for the job.
- Officers expressed that racial profiling is not easily possible because officers rarely know the race of any driver until probable cause for the traffic stop is already established.
- Some officers believe there are likely officers elsewhere who exercise some level of racial profiling or racism on the job and expressed concern about it.
 - “Nobody wants bad cops out of the profession more than good cops do.”
 - “I know there’s bad apples...It stinks that those bad apples make the news and make us all look bad.”
- Officers discussed a keen awareness of intense public scrutiny. They feel this scrutiny often results in biased reporting and social media posts, which affects public perception of law enforcement and perpetuates negative stereotypes of police officers: “We are villainized in the news.”

To varying degree, officers all referenced Illinois’ recent Safety, Accountability, Fairness and Equity-Today Act (SAFE-T Act). Among other things, the act mandates consistent use of officer-worn body cameras. Several officers feel the cameras will protect them from false accusations of racial profiling and other misconduct in the line of duty.

Other Types of Profiling

- Officers explained that they do not profile race, but they seek or “profile” specific behaviors or suspicious vehicles. For example...
 - Vehicles belonging to known criminals or drivers with suspended or revoked licenses (“regular offenders”) may be quickly recognized. This is because officers know the communities they patrol and learn to recognize the vehicles that frequent them.

Vehicles of regular offenders are sometimes profiled, although they cannot be stopped unless there is probable cause.

- Unrecognized vehicles in neighborhoods known for drug-dealing or “junk cars” in affluent neighborhoods with low crime can be indicators of potential criminal activity and are sometimes profiled, although they cannot be stopped unless there is probable cause.
- Behaviors like active avoidance or excessive nervousness/agitation sometimes indicate that drivers are impaired or illegally in possession of alcohol, drugs or firearms. Officers who recognize these behaviors may be compelled to tail that driver and determine if there is probable cause for a stop.

“I’m just tasked with a duty and a job that I’m here to enforce the laws.”

Conclusion

Officers were eager to share their experiences and express their thoughts related to traffic stops. Overall, they emphasized community education and public safety as the central importance in the conduct of traffic stops. Again, what is presented in this section are the views, opinions and experiences of the officers interviewed.

IX. Literature Review, Brief Overview of The Stop Experience

Literature Review: The Stop Experience

Initial literature search was conducted (22 journal articles) in late 2023 to learn about other national studies that were conducted to explore the context of the traffic stop experience from the driver’s perspective. Racial disparities in stops are well-documented. See Appendix E for more details, including a full reference list. Note that the literature review is not primarily about the stop experience in Illinois. The coverage is broad across the country, and findings may or may not apply to the stop experience in Illinois. This section is offered as a broad look at the stop experience.

The Driver Experience

In the studies reviewed, Black drivers, especially males, are disproportionately likely to experience traffic stops, citations, searches and arrests resulting from traffic stops (Baumgartner et al., 2021; Baumgartner et al., 2017; Ben-Menachem & Morris, 2022; Dixon et al., 2008 ; Elkstrom et al., 2022; Harris et al., 2020; Higgins et al., 2012; Stelter et al., 2022; Rojek et al., 2012). These studies used data from one or more cities or states nationally.

Communication Disparities; Demeanor

Communication between officers and drivers during traffic stops has been studied. Researchers found the following:

- Black drivers were more likely than White drivers an unspecified American city to be perceived by listeners of the audio of stops to experience negative prosody (intonation) (Camp et al., 2021).
- Communication quality of white drivers toward officers in Cincinnati, Ohio, was determined to be overall more positive (apologetic, courteous) than that of Black drivers while Black drivers were

less likely to exhibit accommodative communication (behavior is modified due to social differences between the people interacting) compared to white drivers (Dixon et al., 2008).

- Black drivers in Cleveland, Ohio, were more likely than other drivers to be reported as “disrespectful, non-compliant and/or resistant,” regardless of the officers’ race. In the same study, Hispanic drivers were less likely than non-Hispanic drivers to be reported as disrespectful (Engel et al., 2011).

Distrust of Law Enforcement / Police Legitimacy

- As a result of traffic stops, researchers determined that citizens demonstrated mistrust using nationally representative survey data from citizens age 16 and older; they were significantly less likely to seek help from law enforcement and/or report non-crime emergencies, especially among Hispanics and those who perceived they were treated unfairly during traffic stop(s) (Chenane et al., 2020).
- “Police legitimacy can be enhanced if citizens perceive fair treatment and sound decision-making during a traffic stop.” (nationwide dataset; Chenane et al., 2020).
- “Racially disparate policing practices, then, may undermine law enforcement legitimacy in a community as a whole.” (data from Illinois and North Carolina; Anoll et al., 2022).

The Officer Experience

Who officers stop, for what purpose, and stop outcomes have all been studied and reveal disparities. Studies of officers’ race and gender show disparities related to stops.

- Compared to other officers, white male officers in Charlotte, N.C., were more likely to conduct searches, searches that did not yield contraband and make arrests during a traffic stop than officers who were not white (Baumgartner et al., 2021).
- White male officers in Charlotte and St. Louis, Mo., were more likely to search Black drivers than officers who were not white (Baumgartner et al., 2021; Rojek et al., 2012).
- Black officers searched Black drivers more frequently than they searched white drivers. (Baumgartner et al., 2021)
- Searches by white officers in Charlotte were eight times more likely to be fruitless than searches by officers who were not white (Baumgartner et al., 2021).
- In two Ohio studies, regardless of officer characteristics or reason for the stop, officers were more likely to perceive/report Black drivers as disrespectful and non-compliant than drivers who were not Black (Engel et al., 2011; Dixon et al., 2008).

Communication Disparities; Demeanor

Communication between drivers and officers and demeanor during stops were studied. Researchers found that:

- Officers’ communication quality in Cincinnati was more positive when officers and drivers shared the same race. When race was not concordant, officers were perceived as less approachable, more dismissive of driver comments, less respectful and acted more superior than when race was concordant (Dixon et al., 2008).
- Officers were significantly more likely to ask Black drivers (vs. other drivers): about drugs or weapons, to exit the vehicle, for a search of drivers, passengers and/or the vehicle (data from Cincinnati; Dixon et al., 2008).

- Officer prosody (tone) was more favorable toward white than Black drivers (data from an unspecified U.S. city; Camp et al., 2021).
- “...officers speak with consistently less respect toward Black versus white community members, even after controlling for the race of the officer, the severity of the infraction, the location of the stop, and the outcome of the stop.” (data from Oakland, Calif.; Voight et al., 2017)
- Officer characteristics in Cleveland were not predictive of driver non-compliance/resistance when officers rated driver demeanor (Engel et al., 2011).

The Context of Stops

Context is important. Context of traffic stops directly affects the experiences of drivers, pedestrians and officers. Not knowing the full context of stops was a limitation to analyses noted by most of the researchers in the literature review. Context may include demographic characteristics of those involved, sequence of events being measured/analyzed, characteristics of the locations of the stops (such as high or low crime neighborhoods, high or low poverty neighborhoods), attitudes (implicit/explicit biases) and demeanors of those involved, the purpose of the stop, the season/day/time of day/length of the stop, vehicle type and modifications, fiscal motives, and others. Never were all of the contextual factors considered simultaneously in a study. The full scope of officers’ discretionary decision-making (the “stop decision”) in light of various contextual factors is often difficult to pinpoint, assess and/or analyze (Baumgartner et al., 2021; Elkstrom et al., 2022; Engel et al., 2011; Grosjean et al., 2023; Higgins et al., 2012; Stelter et al., 2022; Pickerill et al., 2009; Rojek et al., 2012). Some stops require more discretionary decision-making from officers than others. The higher level of discretion required, the more likely implicit bias and stereotyping play a role in the encounter (Baumgartner et al., 2021).

Also discussed widely in the literature is the historic context of prejudice in the country and its lasting effects on people of color (Engel et al., 2011; Prengler et al., 2023; Donohue, 2023; Baumgartner et al., 2017; Grosjean et al., 2023; Stelter et al., 2022; Lacy, 2023) which may explain, to varying degree, the basis of some of the disparities currently seen across the studies.

Gaps in the Literature

- Qualitative methods may allow for deeper examination of contextual factors; only three of the 22 articles relied on qualitative data or first-hand accounts of the stop experience.
- Studies specifically about the stop experiences of females, both officers and drivers, are lacking.
- Analysis of officer stop rates stratified by years of experience on the job is lacking.

In summary, this literature review has highlighted some factors that *may* be at play in Illinois (and elsewhere). However, repeating the intent of an earlier statement in this report, the literature review is geographically broad and it is primarily educational about the experience at stops. This literature review is not based on analysis of stops data in Illinois.

X. Looking Ahead

The study team continues to review the current statistical methodology and consider refinements and improvements. In the analysis of 2021 stops a major update to the benchmarking approach was made that was carried forward to 2022 and now 2023 stops studies. The striving for ever higher accuracy will continue as relevant datasets become available. Through IDOT, the study team may be in a position to

utilize various new sources of traffic-related data, which may serve as a way to refine or check on the benchmarks.

Appendix A. Traffic Stop Data Collection Form in use during 2023



Traffic Stop Data Sheet



Agency Code

****Section A - Traffic Stop Information****

Date of Stop (MM/DD/YYYY) Time of Stop (Military Time) Duration of Stop (Minutes)

Officer Name Officer Badge Number

Name of Driver

Address City State Zip Code

Vehicle Make Vehicle Year Driver's Year of Birth (ex: 1957)

Driver Sex
1 Male 2 Female

Driver Race
1 White 2 Black or African American 3 American Indian or Alaska Native 4 Hispanic or Latino 5 Asian
6 Native Hawaiian or Other Pacific Islander

Reason for Stop
1 Moving Violation 2 Equipment 3 License Plate / Registration 4 Commercial Vehicle

If Moving, Type of Violation
1 Speed 2 Lane Violation 3 Seat Belt 4 Traffic Sign or Signal 5 Follow too Close 6 Other

Result of Stop
1 Citation 2 Written Warning 3 Verbal Warning / Stop Card

Beat of Location Stop

****Section B - Searches****

Vehicle	Consent Search Requested?	Consent Given?	Search Conducted?	Search Conducted By?
<input type="text"/>	1 <input type="checkbox"/> Yes 2 <input type="checkbox"/> No	1 <input type="checkbox"/> Yes 2 <input type="checkbox"/> No	1 <input type="checkbox"/> Yes 2 <input type="checkbox"/> No	1 <input type="checkbox"/> Consent 2 <input type="checkbox"/> Other

If yes, what was found: 1 Drugs 2 Drug Paraphernalia 3 Alcohol 4 Weapon 5 Stolen Property 6 Other

If a search of the Vehicle was conducted, was contraband found? 1 Yes 2 No

If the contraband found was drugs, what was the amount? 1 < 2 grams 2 2-10 grams 3 11-50 grams 4 51-100 grams 5 > 100 grams

Driver	Consent Search Requested?	Consent Given?	Search Conducted?	Search Conducted By?
<input type="text"/>	1 <input type="checkbox"/> Yes 2 <input type="checkbox"/> No	1 <input type="checkbox"/> Yes 2 <input type="checkbox"/> No	1 <input type="checkbox"/> Yes 2 <input type="checkbox"/> No	1 <input type="checkbox"/> Consent 2 <input type="checkbox"/> Other

Passenger(s)	Consent Search Requested?	Consent Given?	Search Conducted?	Search Conducted By?
<input type="text"/>	1 <input type="checkbox"/> Yes 2 <input type="checkbox"/> No	1 <input type="checkbox"/> Yes 2 <input type="checkbox"/> No	1 <input type="checkbox"/> Yes 2 <input type="checkbox"/> No	1 <input type="checkbox"/> Consent 2 <input type="checkbox"/> Other

If a search of the Driver or Passenger(s) was conducted, was contraband found? 1 Yes 2 No

If yes, what was found: 1 Drugs 2 Drug Paraphernalia 3 Alcohol 4 Weapon 5 Stolen Property 6 Other

If the contraband found was drugs, what was the amount? 1 < 2 grams 2 2-10 grams 3 11-50 grams 4 51-100 grams 5 > 100 grams

****Section C - Police Dog Sniff Searches****

Did a police dog perform a sniff of the vehicle? 1 Yes 2 No

If a police dog performed a sniff of the vehicle, did the dog alert to the presence of contraband? 1 Yes 2 No

If an alert occurred, was the vehicle searched? 1 Yes 2 No

If the vehicle was searched, was contraband found? 1 Yes 2 No

If yes, what was found: 1 Drugs 2 Drug Paraphernalia 3 Alcohol 4 Weapon 5 Stolen Property 6 Other

If the contraband found was drugs, what was the amount? 1 < 2 grams 2 2-10 grams 3 11-50 grams 4 51-100 grams 5 > 100 grams

Appendix B. Technical Notes on Rates, Percentages and Ratios

B.1. Overview

This technical appendix includes a detailed explanation of the rate, post-stop outcomes, and ratio calculations used in constructing the statewide and agency tables that appear in Part II of this report. It is explained how comparisons of each minority group to white drivers or pedestrians are carried out. It is also explained how the confidence interval is calculated based on known sources of uncertainty in the data.⁶ Further, this section describes how an agency may be designated (by a bold font in the tables) as potentially standing out beyond an assumption of no racial profiling. An agency that is designated as standing out might use this report as a basis for further inquiry. As stated elsewhere and repeated here, there is nothing in this report that proves an agency is practicing racial profiling. Some limitations for interpreting the findings are provided, based on the available data and methods.

B.2. Stop rates, post-stop outcomes, and ratio calculations

Calculations for the entire state and for each agency were performed.

B.2.1 Stop rates and rate ratios

Stop rates were calculated separately for each racial group by dividing the number of stops in the racial group by the benchmark estimate of the driving population in the racial group. A description of the methods used to estimate the benchmark populations was explained at length in Appendix C of the previous year's report (pages 34-89).⁷

The number of stops was assumed to follow a Poisson distribution, used in previous examination of racial disparities in traffic stops (Gelman et al. 2007, Ridgeway 2007) and calculated 95% confidence intervals for the rates using exact methods (Garwood 1936). When the benchmark estimate of the population was zero, no rate or confidence interval could be calculated. A benchmark population of zero for a specific minority group happens when the census population estimate for the minority is zero.

Each minority group was compared to white drivers or pedestrians using the ratio of the minority group stop rate to the white group stop rate. A 95% confidence interval was calculated for each rate ratio by conditioning on the sum of the numbers of stops in the two racial groups being compared. Assuming the number of stops in each group followed a Poisson distribution, conditioning on the sum of the number of stops creates a binomial variable. For distance-based benchmarks, an exact confidence was calculated using binomial methods (Lehmann and Romano 2005). If it was impossible to calculate a rate because of a zero benchmark, or if the number of stops in the white group was zero, no rate ratio or confidence interval was reported.

The 95% confidence intervals for rate ratios were calculated from crash-based benchmarks in a different way than for distance-based benchmarks in order to incorporate the number of crashes used in the benchmark (see Appendix C of the previous year's report for how crash-based and distance-based benchmarks were defined and calculated). For each minority group, the proportion of minority stops out

⁶ The estimated benchmark population is an example of a component of the methodology that has uncertainty that could not be quantified for this study.

⁷ <https://idot.illinois.gov/content/dam/soi/en/web/idot/documents/transportation-system/reports/safety/traffic-stop-studies/final--part-i-executive-summary-traffic--6-30-23.pdf>

of the sum of the minority and white stops (p_{stops}) and the proportion of the minority group in the benchmark population out of the minority and white groups ($p_{benchmark}$) were calculated. The rate ratio (for a given minority compared to whites) can be calculated from these proportions using the following formula:

$$\frac{\left(\frac{p_{stops}}{1-p_{stops}}\right)}{\left(\frac{p_{benchmark}}{1-p_{benchmark}}\right)}$$

However, the corresponding 95% confidence interval for the rate ratios requires the effective sample sizes (the numerator and denominator) corresponding to $p_{benchmark}$, which is related to the number of crashes used in the benchmark.

The stops proportion was treated as a binomial variable, as above. The benchmark proportion was initially treated as an over- or under-dispersed binomial with the number of crashes used as the denominator. The variance of the benchmark proportion was estimated using the parametric bootstrap, where the number of crashes per ZIP code was drawn from a multinomial distribution for each bootstrap iteration. The dispersion parameter of the benchmark proportion was estimated as the ratio of the bootstrap variance divided by the variance that is estimated assuming a standard binomial proportion (i.e., using the classic formula: $p[1 - p]/N$, where p is the benchmark proportion and N is the number of crashes). The dispersion parameter indicates how much more variable (dispersion > 1) or less variable (dispersion < 1) the proportion is than expected for a standard binomial variable if the denominator was the number of crashes. The effective denominator for the benchmark proportion, which is the denominator that would produce the same variance as expected using the standard binomial formula, was then calculated as the number of crashes divided by the dispersion parameter. Similarly, the effective numerator of the benchmark proportion was calculated as the benchmark proportion times the effective denominator. Using the number of minority stops, white stops, effective benchmark numerator, and effective benchmark denominator, the 95% confidence of the rate ratio was calculated using exact binomial methods as carried out above for distance-based benchmarks. This method of calculating 95% confidence intervals tends to produce wider intervals than if they were calculated the same way as for distance-based benchmarks, because the effective benchmark numerator and denominator based on the number of crashes are each less than the corresponding benchmark population counts. This methodology is used to account for additional variability in the benchmark population estimates related to the number of crashes, which is generally smaller than the number of stops.

A rate ratio of 1.0 indicates the minority group and white drivers or pedestrians had equal rates of stops. If the 95% confidence interval lies entirely above 1.0, the rate ratio is statistically significantly greater than 1.0 and may require agency inquiry. These statistically significant rate ratios are bolded in the summary tables. These bolded ratios are statistical deviations and the basis for further consideration of potential racial disparities. Comparisons of minority groups to white drivers or pedestrians where the 95% confidence lies below 1.0 (one) are not bolded because the intent of this study is to identify potential racial profiling that discriminates against minority drivers or pedestrians.

B.2.2 Post-stop outcomes

For all calculations, it was assumed that the benchmark accurately captured the population of drivers or pedestrians. The benchmark used to calculate each rate is itself an estimate of the population of drivers or pedestrians for a racial group. Confidence intervals of rates and rate ratios assumed only sampling error and thus do not account for this additional source of error in benchmark estimates. Accounting for benchmark error would increase the width of the confidence intervals reported for rates and rate ratios and would likely reduce the number of agencies that appear to stand out as needing further inquiry.

Post-stop outcome percentages were calculated separately for each racial group. Table B1 shows the type of numerator and denominator used to calculate each percentage shown in the traffic tables.

Table B1. Numerators and denominators for traffic stop outcomes.

Outcome	Numerator	Denominator
CATEGORY: Reasons for Stop		
Moving Violation	Number of moving violation stops	Number of stops
Equipment	Number of equipment stops	Number of stops
Licensing/Registration	Number of licensing/registration stops	Number of stops
Commercial Vehicle	Number of commercial vehicle stops	Number of stops
CATEGORY: Outcomes of Stop		
Verbal Warning	Number of verbal warnings	Number of stops
Written Warning	Number of written warnings	Number of stops
Citation	Number of citations	Number of stops
CATEGORY: Vehicle Searches		
Consent Search	Number of consent searches	Number of stops
All Searches	Number of searches	Number of stops
Contraband Found	Number of searches where contraband was found	Number of searches
CATEGORY: Driver or Passenger Searches		
Consent Search	Number of stops with a consent search*	Number of stops
All Searches	Number of stops with a driver or passenger search*	Number of stops
Contraband Found	Number of stops with a driver or passenger search where contraband was found*	Number of stops with a driver or passenger search*
CATEGORY: Dog Sniff Searches		
Dog Sniff	Number of dog sniffs	Number of stops
Dog Alert after Dog Sniff	Number of dog alerts	Number of dog sniffs
Vehicle Search after Dog Sniff	Number of vehicle searches after a dog sniff	Number of dog sniffs
Contraband Found after Vehicle Search	Number of vehicle searches after a dog sniff, where contraband was found	Number of vehicle searches following a dog sniff
*Although a stop may result in the search of more than one individual (e.g., both the driver and a passenger are searched), multiple individuals searched (from one vehicle) are counted here as one stop with a driver or passenger search or both.		

It was assumed that percentages follow a binomial distribution and can be approximated by a Poisson distribution (Serfling 1978), and confidence intervals for the rates were calculated using exact methods (Garwood 1936). When the denominator of the percentage was zero (for example, an agency had a benchmark of zero for a specific racial group), no percentage or confidence interval could be calculated.

For selected outcomes, each minority group was compared to white drivers using the ratio of the minority group percentage to the white group percentage. A 95% confidence interval for each ratio was calculated using exact methods (Lehmann and Romano 2005). If it was impossible to calculate a percentage because of a zero denominator, or if the numerator of the white group percentage was zero, no ratio or confidence interval was reported.

B.3 Durations

The median durations of stops were calculated separately for each racial group. The median represents the value such that half of stops have a shorter duration than the median and half of stops have a longer duration than the median.

B.4 Limitations

For all calculations, it was assumed that the driver or pedestrian was assigned to the correct racial group. However, an officer's assessment of the race of a driver may be in error — compared to the driver's self-assessed race. Because police officers made the racial group assignment, there is a potential misclassification bias on the race of drivers or pedestrians. If misclassification resulted in a minority driver or pedestrian frequently being categorized in a different minority group, the stop rates of some minority groups may be underestimated while others are overestimated. Consequently, the rate ratios of some minority groups may be underestimated while others are overestimated. This is a limitation that would be difficult to correct based on the available information. Section IV of this report considers in more detail the issue of determining race of drivers.

Some of the alerts to rate ratios (**bolded font** in the tables) may be “false positives.” This can happen as follows. Within the statewide or individual agency tables for traffic and pedestrian stops, five minority group comparisons with the white group were calculated. There were five of these comparisons for each ratio analysis. For example, there are five ratios comparing the stop rate for each of the five minorities to the stop rate for whites⁸. Thus, five 95% confidence intervals were constructed — one each for the five stop-rate ratios. That is, each agency was checked for profiling in each of five minority groups. For each minority comparison with white drivers or pedestrians there was the potential to make a type I error. That is, the potential need for inquiry for profiling may have been, by chance, incorrectly indicated. While a 5% type I error rate for each minority comparison was set, the multiple comparisons inflate the possibility of making such an error overall to more than 5%. It was chosen not to correct for these multiple comparisons, viewing each minority comparison to whites as an independent examination of profiling.

⁸ There may be fewer than five ratios depending on the occurrence of zero stops for Whites or zero benchmark for a Minority. These are cases where a ratio cannot be calculated.

References (for Appendix B)

- Garwood, F (1936). Fiducial limits for the Poisson distribution. *Biometrika*, Vol. 28, Issue 3-4: 437-442.
- Gelman, A, Fagan, J, and Kiss, A (2007). An analysis of the New York City Police Department's 'stop-and-frisk' policy in the context of claims of racial bias. *Journal of the American Statistical Association*, Vol. 102, No. 479, 813–823.
- Lehmann, EL, and Romano, JP (2005). *Testing Statistical Hypotheses*, Third edition. Springer: New York.
- Ridgeway, G. (2007). *Analysis of Racial Disparities in the New York Police Department's Stop, Question, and Frisk Practices*. Santa Monica, CA: RAND Corporation.
https://www.rand.org/pubs/technical_reports/TR534.html
- Serfling, RJ (1978). Some elementary results on Poisson approximation in a sequence of Bernoulli trials. *SIAM Review*, Vol. 20, No. 3, 567-579.

Appendix C. Technical Notes on Benchmarks

C.1. Overview

In the analysis of potential racial profiling, the number of stops by each agency of each racial group is compared to a “benchmark” population of the racial group. The rate of stops per benchmark population for the racial group can be compared to the same rate for whites. The benchmark provides an expected racial distribution of the local population of drivers.

This distribution would be approximately equal to the expected racial distribution of the stops if the stops were conducted in a completely randomized way, blind to the race and the behavior of the driver. That is, the stop rates calculated using a perfectly accurate benchmark would be approximately constant across all racial groups if there were no profiling and if there were no difference in the general behavior of drivers across all racial groups.

This report shares the same methodology of calculating the benchmarks as the previous year's report. The only difference is that the data sources were updated to their most recent available versions, and that there were some changes in the selection of data sources to be used this year. Details on this are covered below. Details on how racial categories were defined, how benchmark regions were determined and other benchmark calculations, the differences in benchmark methodology employed now compared with prior years, and limitations and strengths of the methodology are described at length in the Appendix C of the previous year's report.

C.2. Data Sources

Multiple data sources were combined to calculate benchmarks, including multiple datasets provided by the U.S. Census Bureau, Illinois Department of Transportation, and Illinois Secretary of State. The U.S. Census Bureau datasets used include those from the decennial census, the American Community Survey and Gazetteer files, depending on the year and type of benchmark (traffic stops or pedestrian stops).

C.2.1. Data from the U.S. Census Bureau

The ACS is an ongoing survey conducted by the U.S. Census Bureau that collects information on the U.S. population in all 50 states, the District of Columbia and Puerto Rico⁹. The information collected is similar to that collected by the U.S. decennial census, but the ACS results are released on an annual basis rather than every 10 years. Another difference between the ACS and census is that the ACS is based on a random sample of about 3.5 million individuals while the census attempts to reach every person living in the U.S. and its territories.

Besides the one-year (1Y) ACS releases, there are also five-year (5Y) releases. These 5Y releases combine five consecutive years, primarily to increase the sample size of relatively small areas or groups of individuals. It would be challenging to estimate the population of small communities reliably with only one survey-year of data. In addition to standard tabulations, the ACS also provides individual-level data, referred to as the public use microdata sample. The PUMS data allow more detailed and complex analyses involving multiple variables. Due to privacy concerns, there are restrictions on the level of geographic identification provided with each type of release of ACS data.

The Gazetteer files provide geographic information, such as geographic area, latitude and longitude for different relevant regions in the U.S., including ZIP codes, places (a city, town, or village, referred to simply as city hereafter), counties and states. These files are updated annually.

The U.S. Census Bureau approximates ZIP codes (defined by the U.S. Postal Service) with ZIP code tabulation areas¹⁰. Throughout this report, the term “ZIP code” will be used to refer both to ZCTAs and U.S. Postal Service ZIP code for simplicity.

Table C.1 lists the U.S. Census Bureau datasets used for different purposes for both the traffic and pedestrian stop benchmarks. More detail on pedestrian stop benchmarks can be found in the corresponding Illinois pedestrian stops study report, 2023 stops, Part I. Of note, as can be seen from the table, different datasets were used for traffic and pedestrian benchmarks, which is different than in past years. The primary reason is that pedestrian benchmarks are based on city-, county-, or state-level population statistics, while the traffic stop benchmarks are based on ZIP-code-level population statistics.

The reader who compares this appendix to the corresponding appendix in the 2023 pedestrian stops report will note that the decennial 2020 census data is not used either in this traffic analysis, nor in the 2023 pedestrian stops analysis. The reason is that the newest 2022 5-year ACS release covers 2018-2022, with 2020 being in the middle of that time interval, so the census and the ACS data are now equally “current,” with ACS to start gaining advantage in the next few years. The study team plans to keep using the newest 5Y releases until the next decennial census becomes available.

⁹ <https://www.census.gov/programs-surveys/acs>. Last accessed 5/15/22.

¹⁰ <https://www.census.gov/programs-surveys/geography/guidance/geo-areas/zctas.html>. Last accessed 5/21/22.

Table C.1. U.S. Census Bureau datasets used for benchmarks.

Information Needed	Traffic Stop Benchmarks	Pedestrian Stop Benchmarks
Age distribution in Illinois	1Y ACS PUMS 2022	N/A
Age distribution by race/ethnicity*	5Y ACS PUMS 2018-2022	5Y ACS PUMS 2018-2022
Individual race groups to reallocate residents with more than one race*	5Y ACS PUMS 2018-2022	5Y ACS PUMS 2018-2022
Population counts for each race/ethnicity		
By ZIP code†	5Y ACS 2018-2022	5Y ACS 2018-2022‡
By city	N/A	5Y ACS 2018-2022
By county	N/A	5Y ACS 2018-2022
For Illinois	N/A	5Y ACS 2018-2022
Geographic area of each city in Illinois	Gazetteer Files 2023	N/A
Geographic area of each county in Illinois	Gazetteer Files 2023	N/A
Latitude and longitude of each ZIP code	Gazetteer Files 2023	N/A
1Y = 1-year; 5Y = 5-year; ACS = American Community Survey; DEC = decennial census; PUMS = public-use microdata sample; *Includes Illinois and 24 states within 400 miles of Illinois; †ZIP codes approximated using ZIP code tabulation areas defined by the U.S. Census Bureau; ‡ZIP-code-level data were used for Chicago Police Department benchmarks.		

For this report, multiple ACS releases were used, all corresponding to 2022 as the most recent year of data available. The first was the 2022 1Y PUMS, which was used to estimate the age distribution of the entire population of Illinois in 2022. The second release used was the 2018-2022 5Y PUMS, which was used to 1) estimate the state-level age distribution for each racial group and 2) estimate reallocation factors for individuals reporting multiple races. The 5Y release was used instead of the 1Y release to achieve a larger sample size for those racial groups which had fewer individuals in Illinois. The third release used was the 2018-2022 5Y detailed table of race and ethnicity for each ZIP code in Illinois or any of 24 surrounding states within 400 miles of Illinois (Alabama, Arkansas, Georgia, Indiana, Iowa, Kansas, Kentucky, Louisiana, Michigan, Minnesota, Mississippi, Missouri, Nebraska, North Carolina, Ohio, Oklahoma, Pennsylvania, South Carolina, South Dakota, Tennessee, Texas, Virginia, West Virginia and Wisconsin). In general, the 2022 ACS datasets were used for both traffic stop and pedestrian stop benchmarks instead of the 2020 decennial census because starting this year, ACS datasets (2018-2022) are as current as the decennial dataset (2020) and will become more current in the coming years until a new decennial update become available.

C.2.2. Data from Illinois Traffic Crash Reports

On behalf of this study, the Bureau of Data Collection, Office of Planning & Programming at IDOT provided a report of data extracted from Illinois SR 1050 traffic crash reports from 2020-2022. Information in the crash reports included the date and time of the crash, the location of the crash (latitude, longitude, city and county), the number of vehicles involved, the ZIP code of each driver’s address, the type of road on which the crash occurred, and the type of law enforcement agency

filing the report. This information was used to estimate driver benchmark populations for agencies with a sufficient number of usable reports available. In particular, the crash data were used to estimate the proportion of drivers originating from each ZIP code directly associated with an agency's jurisdiction as well as ZIP codes from the surrounding area.

C.2.3. Data from the Illinois Secretary of State

On behalf of this study, the Bureau of Data Collection, Office of Planning & Programming at IDOT requested and received a report from the Illinois Secretary of State's office, a report with counts of licensed drivers in Illinois for each single year of age. The report was run on February 26, 2024. This was combined with ACS estimates of the population count of each age in Illinois (2022 1Y PUMS) to determine the proportion of individuals who are potential drivers based on having a driver's license as a function of age.

Appendix D. Additional Notes on Illinois Law Concerning the Stops Study

The Illinois General Assembly has promulgated laws that require the collection and analysis of data on traffic stops by law enforcement agencies in the state. The statutes relating to the statistical analysis of traffic and pedestrian stops are found in the Compiled Statutes of the Illinois General Assembly, 625 ILCS 5/11-212, effective 6/21/2019. See also Public Act 101-0024.

Section 11-212 of the Illinois statute authorizes the traffic and pedestrian stop statistical study. This section also requires that when a police officer stops an individual, a specific set of information is to be recorded. This information includes name, address, gender, race (six specific categories: white, Black or African American, Hispanic or Latino, Asian, American Indian or Alaska Native and Native Hawaiian or Other Pacific Islander), the violation, vehicle information, date, time, location, search information, whether contraband was found, disposition of the stop (warning, citation or arrest — arrest recorded only for pedestrian stops¹¹) and the name and badge number of the officer. This information is to be obtained whether the police officer makes a traffic stop or a pedestrian stop and either issues a citation or a warning (or arrest for a pedestrian stop). In addition, the length of the contact in minutes is to be recorded for traffic stops. These data items are recorded using the data collection form included in Appendix A. The law further specifies that the collected data are to be sent to IDOT by a specific date each year for the stops data collected in the preceding year.

IDOT is further directed by statute to analyze the data and submit summary reports to the Governor, the General Assembly and the Racial Profiling Agency. The Illinois Department of Transportation is authorized to contract with an outside entity for the analysis of the data. That analysis is the purpose of this report. Moreover, the reporting entity is directed to scrutinize the data for evidence of "statistically significant aberrations." An illustrative list of possible aberrations recorded in the statute include: (1) a higher-than-expected number of minorities stopped, (2) a higher-than-expected number of citations

¹¹ The pedestrian stop data collection form in use during 2023 has provision for recording an arrest. The traffic stop data collection form in use during 2023 does not provide a means of recording an arrest.

issued to minorities, (3) a higher-than-expected number of minorities stopped by a specific police agency, and (4) a higher-than-expected number of searches conducted on minority drivers or pedestrians.

The relevant statute, 625 ILCS 5/11-212 and subsection (a) provides that the law enforcement officer "...shall record at least the following...". The statute seems to suggest the current data collection form includes a minimum level of information and leaves open the possibility of gathering additional information in the future.

There are a few additional data items that could be collected during traffic stops to enhance the analysis effort. Some additional data might include: (1) arrest for DUI, (2) officer's race (which has been shown to affect stop rates; see Ba et al. *Science*. 2021 Feb 12:696-702), (3) occurrence of a physical arrest in a traffic stop (the arrest outcome is currently included only in the pedestrian stop data collection form) and (4) latitude and longitude of the stop (which can be used to more precisely determine the benchmark for drivers or pedestrians but might need some technological changes). Additionally, there is a section on this report on estimating the accuracy of race designation by the stopping officer. The findings of that research suggest that obtaining the self-reported race from the driver may improve accuracy of reported race.

Appendix E. Supplemental Literature Review; The Stop Experience

Note that the literature review (including this appendix) is not primarily about the stop experience in Illinois. The coverage is broad across the country, and findings may or may not apply to the stop experience in Illinois. This appendix is offered as a broad look at the stop experience and extends the narrative offered in section IX, “Literature Review, Brief Overview of The Stop Experience,” above.

Research Question

What does published research say about the stop experience of law enforcement officers, drivers and pedestrians as it relates to race and racial disparities?

Search Parameters

- Journal articles published in the past 15 years (2008-2023); books excluded
- Research samples drawn from the USA populations
- Systematic reviews excluded
- Databases searched: Project MUSE (Harvard University Library); PubMed (National Library of Medicine); ScienceOpen

The search was limited. The hope is to expand the search/review in the upcoming year(s).

Research specific to pedestrian stops was not specifically searched at this time, but a few articles retrieved during searches on traffic stops also related to pedestrian stops.

Findings

Defining and exploring “the stop experience” is complex. The literature provides largely theory and statistical descriptions of stops and their outcomes; sparse literature provides first-hand experiences as described by officers and citizens.

Many researchers describe in their work how the stop experience includes an embedded history of racialized government and prejudice in the country and its lasting effects on people of color, specifically on Black male citizens, and may be reflected in some of the disparities currently seen in stops data (Engel et al., 2011; Prengler et al., 2023; Donohue, 2023; Baumgartner et al., 2017; Grosjean et al., 2023; Stelter et al., 2022; Lacy, 2023). This history may affect, to varying degree, both implicitly and explicitly, the stop experience for officers and citizens. This review does not specifically explore the history of American race relations but focuses on recent stop data and measurable variables presented therein.

The Driver Experience: What Happens during a Stop

Racial disparities in traffic stops are well-documented in decades of literature. These disparities contribute to shaping the driver experience. Disparities commonly include racial minority drivers, especially Black drivers, being stopped, cited, searched and arrested disproportionately compared to white drivers. The disparities are known, but why they persist and how they impact the stop experience is a more common question explored in the recent literature.

“Controlling for why and when they were stopped, which officer pulled them over, and whether or not they had contraband in the car, young men of color are much more likely to see adverse outcomes.” (Baumgartner et al., 2017) Black drivers, especially males, are disproportionately likely to experience:

- Traffic stops (Baumgartner et al., 2021 ; Baumgartner et al., 2017; Ben-Menachem & Morris, 2022; Ekstrom et al., 2022; Harris et al., 2020; Stelter et al., 2022; Dixon et al., 2008)
- Traffic citations (Baumgartner et al., 2021)
- Traffic stops resulting in searches (Baumgartner et al., 2017; Ekstrom et al., 2022; Higgins et al., 2012; Dixon et al., 2008; Rojek et al., 2012)
- Fruitless searches (Baumgartner et al., 2017; Ekstrom et al., 2022)
- Arrests resulting from traffic stops (Baumgartner et al., 2017; Ekstrom et al., 2022)

For drivers who are impaired during the stop (such as DUI), white drivers are more likely to be arrested than Black drivers while Black drivers are more likely to be cited for impairment (such as DUI) than white. (Baumgartner et al., 2017)

Communication Disparities; Demeanor

Communication during traffic stops has been studied. During a traffic stop, Black drivers are more likely to be subject to less formal speech patterns (deferential speech), more negative prosody (intonation) and less respectful speech from officers than white drivers (Camp et al., 2021; Dixon et al., 2008; Voight et al., 2017); communication quality of white drivers was overall more positive (apologetic, courteous) than that of Black drivers, while Black drivers were less likely to exhibit accommodative communication (behavior is modified due to social differences between the people interacting) compared to white drivers (Dixon et al., 2008). According to Voight et al. (2017), "...officers speak with consistently less respect toward black versus white community members, even after controlling for the race of the officer, the severity of the infraction, the location of the stop, and the outcome of the stop." (Voight et al., 2017)

In an officer-reported study of driver behavior, Engel et al. (2011) show that "Black drivers were significantly more likely to be reported as disrespectful, non-compliant and/or resistant, regardless of the officers' race." In the same study, Hispanic drivers were less likely to be reported as disrespectful, and female drivers were slightly more likely than male drivers to be labeled non-compliant across officers' race. (Engel et al., 2011)

These types of interactions or disparities "could have adverse downstream effects" because as they accumulate, they likely help shape how communities, especially Black communities, view law enforcement as an institution and their willingness to support it. (Voight et al., 2017).

The Driver Experience: What Happens after a Stop

Trust & Distrust of Law Enforcement

Interaction with police shapes, positively or negatively, citizens' trust in law enforcement. Trust determines willingness to support or cooperate with the police, and traffic stops are the most common interaction the public has with law enforcement. Minority males and impoverished communities are over-represented in policing activities: "for every fruitless search following a traffic stop, we should recognize that a citizen, often a young man of color, was just reminded of his lack of full citizenship." (Baumgartner et al., 2021)

As a result of traffic stops, citizens in one study demonstrated mistrust in that they were significantly less likely to seek assistance from law enforcement and/or report emergencies unrelated to crime, especially among Hispanics and those who perceived they were treated unfairly during their traffic stop(s). (Chenane et al., 2020). According to Chenane et al. (2020), "police legitimacy can be enhanced if citizens perceive fair treatment and sound decision-making during a traffic stop." Accordingly, Anoll et

al. (2022) state that “Racially disparate policing practices, then, may undermine law enforcement legitimacy in a community as a whole... racial disparities in police behavior are indeed associated with citizen attitudes... when the state engages in racially biased actions, it undermines the legitimacy and perceived quality of its agents, and not just among those bearing the brunt of disparate treatment.” (Anoll et al., 2022)

Stops and Political Participation

One study showed that stopped drivers of all races were less likely to vote than those who were not stopped, at least in the short term. In that study, Black voter turnout was less affected than for people who were not Black (Ben-Menachem & Morris, 2022). Conversely, in terms of non-voting political participation, citizens who experienced traffic or pedestrian stops were more likely to participate in non-voting politics. This effect was more pronounced in whites and in those who expressed positive evaluations of the police. (Christiani & Shoub, 2022)

The Officer Experience: What Happens during a Stop

Police officers are in positions of authority when they stop citizens. Whom officers stop, for what purpose they make the stops and the outcomes of the stops have all been studied. Studies often reveal disparities.

Officer Characteristics

Studies of officers’ race and gender show disparities related to stops.

- White male officers were more likely to conduct a search, conduct fruitless searches and make an arrest during a traffic stop than officers who were not white. (Baumgartner et al., 2021)
- White male officers were more likely to search Black drivers than officers who were not white. (Baumgartner et al., 2021; Rojek et al., 2012)
- Black officers searched Black drivers more frequently than they searched white drivers. (Baumgartner et al., 2021)
- Searches by white officers were 8 times more likely to be fruitless than searches by officers who were not white. (Baumgartner et al., 2021)
- In two Ohio studies, regardless of officer characteristics or reason for the stop, officers were more likely to perceive/report Black drivers as disrespectful and non-compliant than drivers who were not Black. (Engel et al., 2011; Dixon et al., 2008)

Communication Disparities; Demeanor

Communication between drivers and officers and their demeanor during stops has been studied.

In a study of officers’ body worn camera footage, researchers reported that officers’ communication quality was more positive when officers and drivers shared the same race. When officer and driver races were different, officers were perceived by the study team as less approachable, more dismissive of driver comments, less respectful and acted more superior than when officers and drivers were race concordant. (Dixon et al., 2008) In the same study, officers were significantly more likely to ask Black drivers about drugs or weapons, to exit the vehicle, for a search of drivers, passengers and/or the vehicle.

Another study used body camera footage to examine how officer prosody (tone, pitch, etc.) during interactions play a role in determining how citizens perceive law enforcement. Officer prosody was seen as more favorable toward white than Black drivers. (Camp et al., 2021) That study team posited that racial disparities in communication deteriorate trust in institutions in police departments and beyond.

In terms of driver non-compliance/resistance, officer characteristics in one study were not predictive when officers rated driver demeanor. (Engel et al., 2011)

The Context of Stops

Context is important. The context of stops directly affects the stop experiences of drivers, pedestrians and police officers. In addition to demographic characteristics of the officers/citizens involved in the stops, context may include attitudes (implicit/explicit biases) and demeanors of the people involved, sequence of events being measured/analyzed, characteristics of the locations of the stops (examples: high or low crime neighborhoods, high or low poverty neighborhoods), the purpose of the stop including whether it was for safety or investigatory, the season/day/time of day of the stop, the length of the stop, vehicle type and modifications, fiscal motives, and others. The full scope of officers' discretionary decision-making (the "stop decision") in light of various contextual factors is often difficult to pinpoint, assess and/or analyze. (Baumgartner et al., 2021; Ekstrom et al., 2022; Engel et al., 2011; Grosjean et al., 2023; Higgins et al., 2012; Stelter et al., 2022; Pickerill et al., 2009; Rojek et al., 2012)

Implicit Bias

Studies in this review that used data from Project Implicit in conjunction with the Stanford Open Policing Project include Ekstrom et al. (2022) and Stelter et al. (2022). Project Implicit (<https://www.projectimplicit.net>) measures racial stereotypes and prejudice in various ways. Research teams in these two studies focused on county-level data on racial biases and prejudices in conjunction with traffic stops.

Discretionary decision-making is a crucial part of the officer experience. Some stops require more discretionary decision-making from officers than others. The higher level of discretion required, the more likely implicit bias and stereotyping plays a role in the encounter (Baumgartner et al., 2021). These decisions include whether to pull a car over and what subsequent actions to take during the stop. Stelter et al. (2022) explored the role of prejudice on officer decision-making. Their analysis shows white residents' racial bias at the county level was associated with disparities in traffic stops at the county level: "in stop decisions, prejudice toward Blacks might be more relevant than threat-related stereotypes." (Stelter et al., 2022) In this way, regional bias helped to explain the context of stop disparities and the context in which officers operate.

Ekstrom et al. (2022) found that counties with a higher proportion of white residents had traffic stops with significant racial disparities and county-level racial demographics were "robust predictors of racial disparities in traffic stops." Like Stelter et al. (2022), Ekstrom's team found that disparities were related to racial attitudes and demographics of the county where the stops took place. They conclude that Black citizens in uniformly white counties are "systematically subjected to a greater degree of scrutiny and suspicion" than white citizens in those counties (Ekstrom et al., 2022). In Black neighborhoods, another study found that stops of white drivers by white officers are most likely to result in a search even though searches were more likely in stops of Black over white drivers overall. (Rojek et al., 2012)

Higgins, Vito & Grossi (2012) studied the decision-making process of officers to search motorists. They concluded that "blameworthiness" is the primary reason searches are performed on any driver. Blameworthiness involves judgment by the officer during the decision-making process to determine "the culpability of the individual." Blameworthiness or culpability can be driven by contraband in plain view, for example, but often times is not. Blameworthiness can be embedded in an officer's implicit beliefs, and it may be that officers find Black motorists blameworthy by nature, hence deserving of searches. (Higgins et al., 2012)

Political Context

Local events and regional politics may affect bias in the context of traffic stops as well. A study in Missouri showed that traffic stop arrest rates increase and citations among white drivers rise when there is high local municipal budget distress. This can be explained by the need to “enhance the revenue stream” (Harris et al., 2020). One study shows that campaign rallies in 2015-16 for the Republican presidential candidate increased the probability of Black drivers being stopped by 5.7% whereas stops did not increase after rallies for the Democratic presidential candidate those years. This is credited to the “inflammatory political campaigns” presented by at that time by the Republican candidate. (Grosjean et al., 2023) One study of officer partisanship showed that white registered Republican officers are significantly more likely to search Black drivers than white officers who are registered Democrats. (Donohue, 2023)

Veil of Darkness

The Veil of Darkness hypothesis posits that nighttime darkness should result in fewer racially motivated stops because officers cannot visually determine driver race as easily in darkness. Stelter et al. (2022) suggest that officers don’t need to know a person’s features but may be able to use other information for profiling, like vehicle type. Engel et al. (2011) note that officers in their study are required to document after-market modifications “such as tinted windows, high performance exhaust systems, or aftermarket rims.” Collecting additional data such as vehicle condition, cosmetic defects and aftermarket modifications could prove helpful in understanding the nature of stops unrelated to the Veil of Darkness. Veil of Darkness is contested; Stelter et al. (2022) showed that rates of stops of Black drivers during nighttime were not significantly less than stops during daytime.

Black Officers

Prengler et al. (2023) studied how Black law enforcement officers address racism within their own organizations. Black officers who had experienced past racism often used the experience as motivation to challenge racism from within law enforcement even if they continued to experience or be exposed to racism with the organization. Some Black officers expressed hope in cultivating mutual respect between Black communities and law enforcement. (Prengler et al., 2023) Baumgartner et al. (2021) cite the research of colleagues on how Black officers can adopt the racist thinking of their White counterparts.

Gaps in the Literature

Qualitative research was sparse. Qualitative methods, such as individual interviews, often allow for a deeper examination of contextual factors and the lived experience more readily than numeric/survey data alone. Excluding observational studies where visual or auditory data were transformed into numeric scores, only three of the papers reviewed or relied on qualitative data or first-hand experiences.

1. In Chicago, the law enforcement blog “Second City Cop” provided anecdotal qualitative data to enhance the statistical data from the city’s Traffic Stops Statistical Study (Hausman & Kronick, 2020). Comments extracted from the blog provided support to researchers’ findings that the Chicago Police Department encouraged an increase in traffic stops when the pedestrian “stop and frisk” protocol ended.
2. Individual interviews with 48 Black law enforcement officers helped researchers develop a theory on if or how employees of racial minorities challenge the structural racism of the organizations in which they work (Prengler et al., 2023).
3. Narratives of 15 Black men demonstrated the complexities of race and interactions with law enforcement (Lacy, 2023). As children or young adults, these men were prepared by one or both parents about how to remain safe during inevitable future interactions with police officers. Among this cohort, this discussion is known widely as “The Talk.”

Another gap in the literature are studies specifically about the stop experiences of female officers and drivers, and analysis of officer stop rates stratified by years of experience on the job.

Common Study Limitations

Lack of one or more key elements of stop context were the primary limitations to the studies reviewed. This includes temporality or the chronology of the variables being analyzed, preventing the determination of which disparities are causal and which are consequential. While some elements of stops were analyzed, never were all of the contextual factors considered simultaneously in a study. Limitations of smaller studies are that they may not be generalizable, but one could argue that data are never generalizable outside of specific regions or based on the variability of contextual factors at the county or jurisdiction level such as political climate, racial history and demographic makeup of given areas. For studies that involve coders or raters (examinations of audio/visual data), potential bias is introduced based on the implicit biases of the coders and raters themselves.

Some studies used Project Implicit data. This database is not representative of the U.S. population, excluding many Midwestern and southern states, and the data skew liberal. Lastly, studies that use benchmark tests may have limitations based on the benchmarking process.

Summary/Conclusions

There are many stop-related disparities presented and analyzed in the literature. Disparities relate largely to racial minorities, especially Black citizens. Racial minorities are shown to be over-stopped, over-cited, over-detained and over-searched. Many contextual variables, theories, causes and effects are explored in the research. One worrisome finding is that “evidence for racial discrimination appears to be growing stronger over time.” (Baumgartner et al., 2017) Proposed future studies are many; proposed solutions are few.

For citizens, literature shows that racial minorities’ trust in law enforcement is diminished because they experience disproportionate stops compared to their white peers. Community-wide diminished trust suggests diminished cooperation with law enforcement. This may be reflected in communication patterns. In adults, stops are associated with political participation, both positively and negatively. In adolescents, pedestrian stops are associated with increased psychological distress, which in turn predicts lower grades in school.

Officers of all racial groups are more likely to stop Black drivers as well as search them more often than drivers of other races, especially if the officers are white. Studies of communication show that officers may be more likely to perceive/report Black drivers as disrespectful and non-compliant than other drivers. Studies show that officers may behave disparately in response to changes in the local political climate or municipal budget shifts.

Cited from the reviewed literature, suggestions for future studies to find/understand disparities, their context and/or how to produce more equitable stop data and outcomes include:

- Examine patterns/outcomes by gender (Baumgartner et al., 2021; Camp et al., 2021; Engel et al., 2011)
- Include variables with county- or neighborhood-level data for context (Ekstrom et al., 2022; Engel et al., 2011; Harris et al., 2020; Hausman & Kronick, 2020; Stelter et al., 2022; Chenane et al., 2020)
- Incorporate qualitative or mixed-method data to better understand the issues (Engel et al., 2011)

- Consider cultural differences when examining data about perceptions, communication or behavior/demeanor (Engel et al., 2011)
- Study whether the reduction of pedestrian stops influences crime rates/disparities (Hausman & Kronick, 2020)
- Wider application of theories/models can help to better understand the issues and the outcomes of stops (Higgins et al., 2012; Prengler et al., 2023; Chenane et al., 2020; Dixon et al., 2008; Rojek et al., 2012) including the veil-of-darkness test (Stelter et al., 2022)
- Research further the effects of law enforcement interactions on citizen- or community-level (dis)trust and/or political participation (Voight et al., 2017; Chenane et al., 2020; Christiani & Shoub, 2022)
- Offer bilateral community-based interventions focused on mutual trust-building (Dixon et al., 2008)
- Emphasize communication skills in officer training (Dixon et al., 2008)
- Analyze officers' body-worn camera footage to further examine/address disparities and context (Camp et al., 2021; Voight et al., 2017)
- Create a diverse police force "that accurately represents its community" (Baumgartner et al., 2021)
- Increase the understanding of variation within Black communities and when/how law enforcement contact has mobilizing/demobilizing effects (Ben-Menachem & Morris, 2022)
- Study the effects of multiple law enforcement encounters on citizens and how the experiences compound or evolve (Camp et al., 2021; Del Toro et al., 2021; Christiani & Shoub, 2022) including those who were formerly incarcerated (Ben-Menachem & Morris, 2022)
- Study the effects of stops on adolescent development in terms of health and well-being (Del Toro et al., 2021)
- Educate policymakers about "negative biases in policing" (Del Toro et al., 2021) especially for youth

References (for Appendix E)

1. Anoll A, Epp D, Israel-Trummel M. Contact and context: how municipal traffic stops shape citizen character. *The Journal of Politics*. 2022. Vol. 84(4).
2. Baumgartner F, Bell K, Beyer L, et al. Intersectional encounters, representative bureaucracy, and the routine traffic stop. *Policy Studies Journal*. 2021. Vol. 49(3):860-886.
3. Baumgartner F, Epp D, Shoub K, et al. Targeting young men of color for search and arrest during traffic stops: evidence from North Carolina, 2002–2013. *Politics, Groups, and Identities*. 2017. Vol. 5(1):107-131.
4. Ben-Menachem J, Morris K. Ticketing and turnout: The participatory consequences of low-level police contact. *Am Polit Sci Rev*. 2022.
5. Camp NP, Voigt R, Jurafsky D, Eberhardt JL. The thin blue waveform: Racial disparities in officer prosody undermine institutional trust in the police. *J Pers Soc Psychol*. 2021 Dec;121(6):1157-1171.
6. Chenane J, Wright E, Gibson C. Traffic stops, race, and perceptions of fairness, *Policing and Society*, 2020;30:6, 720-737.
7. Christiani L, Shoub K. Can light contact with the police motivate political participation? Evidence from traffic stops. *J. Race Ethnicity Politics*. 2022. Vol. 7(3):385-405.
8. Del Toro J, Wang MT, Thomas A, Hughes D. An intersectional approach to understanding the academic and health effects of policing among urban adolescents. *J Res Adolesc*. 2022;32(1):34-40.

9. Dixon T, Schell T, Giles H, et al. The influence of race in police-civilian interactions: A content analysis of videotaped interactions taken during Cincinnati police traffic stops. *J Commun.* 2008; 58(3):530-549.
10. Donahue, ST. The politics of police. *American Sociological Review*, 2023;88(4):656-680.
11. Ekstrom PD, Le Forestier JM, Lai CK. Racial demographics explain the link between racial disparities in traffic stops and county-level racial attitudes. *Psychol Sci.* 2022;33(4):497-509.
12. Engel R, Tillyer R, Klahm IV C, Frank J. From the officer's perspective: A multilevel examination of citizens' demeanor during traffic stops, *Justice Quarterly*, 2011;29(5):650-683.
13. Grosjean P, Masera F, Yousaf H. Inflammatory political campaigns and racial bias in policing. *The Quarterly Journal of Economics*, 2023;138(1):413-463.
14. Harris A, Ash E, Fagan J. Fiscal pressures and discriminatory policing: evidence from traffic stops in Missouri. *J. Race Ethnicity Politics*, 2020;5(3):450-480.
15. Hausman D, Kronick D. The illusory end of stop and frisk in Chicago? *Sci Adv.* 2023; 29;9(39):eadh3017.
16. Higgins GE, Vito GF, Grossi EL. The impact of race on the police decision to search during a traffic stop: A focal concerns theory perspective. *J Contemporary Criminal Justice*, 2012;28(2):166-183.
17. Lacy NB. #TheTalk for Black men: Understanding survival strategies for Black masculinity in US law enforcement interactions. *Spectrum: A Journal on Black Men*, 2023;10(2):73-98.
18. Pickerill J, Mosher C, Pratt T. Search and seizure, racial profiling, and traffic stops: A disparate impact framework. *Law & Policy.* 2009;31(1):1-30.
19. Prengler MK, Chawla N, Leigh A, Rogers KM. Challenging racism as a Black police officer: An emergent theory of employee anti-racism. *J Appl Psychol.* 2023;108(2):249-272.
20. Rojek J, Rosenfeld R, Decker S. Policing race: The racial stratification of searches in police traffic stops. *Criminology.* 2012;50(4):993-1024.
21. Stelter M, Essien I, Sander C, Degner J. Racial bias in police traffic stops: White residents' county-level prejudice and stereotypes are related to disproportionate stopping of Black drivers. *Psychol Sci.* 2022;33(4):483-496.
22. Voigt R, Camp NP, Prabhakaran V, Hamilton WL, Hetey RC, Griffiths CM, Jurgens D, Jurafsky D, Eberhardt JL. Language from police body camera footage shows racial disparities in officer respect. *Proc Natl Acad Sci USA.* 2017;114(25):6521-6526.