

A photograph of the Maricopa County Sheriff's Office building at dusk. The building features a prominent, large, triangular structure with a perforated metal facade that glows from within. To the right, a modern glass-walled section of the building is visible, showing interior lights.

MARICOPA COUNTY SHERIFF'S OFFICE  
Traffic Stops Quarterly Report 11 Appendix  
2022 Low Stop Volume Deputies



Authors: Andrew J. Prelog, MA, PhD | David Redpath, MA | Briana Frenzel, MA, MSW

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## Alternate Models from TSQR 11 Low-Volume Deputy Comparative Analysis

In this appendix we report the results of the propensity score matched difference-in-difference analysis for all alternate models not included in the full report. For each analysis, we provide the observed difference on stop outcomes or stop length between (a) high-volume deputy stops of White drivers and Hispanic drivers, Black drivers, and Minority drivers (Hispanic, Black, Native American, and Asian drivers combined), (b) differences between low-volume deputy stops of White drivers, Hispanic drivers, Black drivers, and Minority drivers, and (c) differences in difference (DID) between high-volume deputy stops and low-volume deputy stops for each comparison group.

We provide a series of approved alternate models for the different benchmarks as they are reported in the TSAR report, reflecting consideration of the importance of using some variables as controls or matching variables. We conclude with a summary from all models that utilized special assignments as matching variables identifying whether results were statistically significant and identify the direction of the observed disparity. Tables 1-8 report alternative models excluding special assignments as matching variables. Tables 9-21 report results from all models when using special assignments as additional matching variables.

### Alternate Models, Excluding Special Assignments as Matching Variables

#### Stop Length

**Table 1:** Stop length, all stops

	Difference (in minutes)	t-statistic	Statistically significant?
High-Volume: Hispanic vs. White	0.972	1.85	No
Low-Volume: Hispanic vs. White	-2.718	-1.40	No
Difference-in-difference	-3.690	-1.83	No
High-Volume: Black vs. White	0.684	1.51	No
Low-Volume: Black vs. White	4.517	2.54	Yes
Difference-in-difference	3.833	2.09	Yes
High-Volume: Minority vs. White	0.838	1.81	No
Low-Volume: Minority vs. White	-1.020	-0.58	No
Difference-in-difference	-1.858	-1.03	No

**Table 2:** Stop length, controlling for extended stops (excluding Language Barrier)

	Difference (in minutes)	t-statistic	Statistically significant?
High-Volume: Hispanic vs. White	0.972	1.85	No
Low-Volume: Hispanic vs. White	-2.718	-1.85	No
Difference-in-difference	-3.690	-1.83	No
High-Volume: Black vs. White	0.684	1.51	No
Low-Volume: Black vs. White	4.517	2.54	Yes
Difference-in-difference	3.833	2.09	Yes
High-Volume: Minority vs. White	0.838	1.81	No
Low-Volume: Minority vs. White	-1.020	-0.58	No
Difference-in-difference	-1.858	-1.03	No

**Table 3:** Stop length, including extended stops as matching variables (excluding Language Barrier)

	Difference (in minutes)	t-statistic	Statistically significant?
High-Volume: Hispanic vs. White	-0.157	-0.29	No
Low-Volume: Hispanic vs. White	0.576	0.29	No
Difference-in-difference	0.733	0.36	No
High-Volume: Black vs. White	1.001	2.32	Yes
Low-Volume: Black vs. White	5.072	3.00	Yes
Difference-in-difference	4.071	2.33	Yes
High-Volume: Minority vs. White	-0.081	-0.17	No
Low-Volume: Minority vs. White	1.097	0.61	No
Difference-in-difference	1.178	0.63	No

**Table 4:** Stop length, only extended stops

	Difference (in minutes)	t-statistic	Statistically significant?
High-Volume: Hispanic vs. White	-1.682	-1.00	No
Low-Volume: Hispanic vs. White	-12.224	-2.45	Yes
Difference-in-difference	-10.542	-2.00	Yes
High-Volume: Black vs. White	-0.418	-0.29	No
Low-Volume: Black vs. White	8.271	1.66	No
Difference-in-difference	8.689	1.68	No
High-Volume: Minority vs. White	-0.549	-0.37	No
Low-Volume: Minority vs. White	-10.206	-2.25	Yes
Difference-in-difference	-9.657	-2.03	Yes

## Arrests

**Table 5:** Booked arrests, compared to all other stops

	Difference (percentage)	t-statistic	Statistically significant?
High-Volume: Hispanic vs. White	0.4	2.94	Yes
Low-Volume: Hispanic vs. White	0.7	1.48	No
Difference-in-difference	0.3	0.66	No
High-Volume: Black vs. White	0.4	2.64	Yes
Low-Volume: Black vs. White	1.4	2.24	Yes
Difference-in-difference	1.0	1.52	No
High-Volume: Minority vs. White	0.4	2.98	Yes
Low-Volume: Minority vs. White	0.9	1.91	No
Difference-in-difference	0.5	1.08	No

**Table 6:** Booked arrests compared to cite and release arrests

	Difference (percentage)	t-statistic	Statistically significant?
High-Volume: Hispanic vs. White	1.6	0.61	No
Low-Volume: Hispanic vs. White	14.3	1.27	No
Difference-in-difference	12.7	1.09	No
High-Volume: Black vs. White	11.6	3.78	Yes
Low-Volume: Black vs. White	3.3	0.32	No
Difference-in-difference	-8.3	-0.78	No
High-Volume: Minority vs. White	3.2	1.26	No
Low-Volume: Minority vs. White	18.7	1.81	No
Difference-in-difference	15.5	1.46	No

**Table 7:** Arrests, excluding warrant arrests

	Difference (percentage)	t-statistic	Statistically significant?
High-Volume: Hispanic vs. White	0.9	2.87	Yes
Low-Volume: Hispanic vs. White	0.0	0.00	No
Difference-in-difference	-0.9	-0.75	No
High-Volume: Black vs. White	-0.9	-2.69	Yes
Low-Volume: Black vs. White	-2.2	-1.64	No
Difference-in-difference	-1.3	-0.94	No
High-Volume: Minority vs. White	0.4	1.30	No
Low-Volume: Minority vs. White	-0.7	-0.64	No
Difference-in-difference	-1.1	-0.95	No

## Citations

**Table 8:** Citations, no offense categories or speed used as matching variables (previous baseline)

	Difference (percentage)	t-statistic	Statistically significant?
High-Volume: Hispanic vs. White	3.1	4.04	Yes
Low-Volume: Hispanic vs. White	-1.5	-0.51	No
Difference-in-difference	-4.6	-1.55	No
High-Volume: Black vs. White	-0.5	-0.58	No
Low-Volume: Black vs. White	4.6	1.38	No
Difference-in-difference	5.1	1.48	No
High-Volume: Minority vs. White	2.3	3.15	Yes
Low-Volume: Minority vs. White	-1.3	-0.49	No
Difference-in-difference	-3.7	-1.28	No

## Alternate Models, Including Special Assignments as Matching Variables

In the models below, we repeat the analyses presented in the main body of this report and the alternative models presented in Tables 1-8 in this appendix but include special assignments as matching variables. Special assignments have been included in previous TSAR analyses as matching variables. Beginning with this year’s TSAR, special assignments are included as matching variables only in the “alternative models.” Special assignments in the 2022 data include stops made on DUI Taskforce, Aggressive Driving patrols, and Click-It-Or-Ticket special assignments.

Summary Table 22 provides an overview of results when special assignments are included in the models as matching variables. Results from these analyses mirror those found in the main body of this report, with two exceptions. The first is the analysis of stop length, when using only extended stops (Table 13). Under this condition, we found statistically no significant difference-in-difference between low- and high-volume deputies. The second difference in results was identified in the analysis of searches (Table 16). This analysis found that the difference-in-difference between high- and low-volume searches of Black and White drivers was statistically significant. In this comparison, the disparity of low-volume deputy searches is one percent lower than that of their high-volume counterparts. To put this into perspective, the difference in search rates between White and Black drivers for high-volume deputies was 0.2 percent. Whereas the search rate between Black and White drivers by low-volume deputies was –0.8 percent, although not statistically significant.

### Stop Length

**Table 9:** Stop length, all stops

	Difference (in minutes)	t-statistic	Statistically significant?
High-Volume: Hispanic vs. White	0.980	1.87	No
Low-Volume: Hispanic vs. White	–2.470	–1.27	No
Difference-in-difference	–3.450	–1.72	No
High-Volume: Black vs. White	0.687	1.54	No
Low-Volume: Black vs. White	4.930	2.82	Yes
Difference-in-difference	4.243	2.35	Yes
High-Volume: Minority vs. White	0.850	1.84	No
Low-Volume: Minority vs. White	–0.988	–0.57	No
Difference-in-difference	–1.838	–1.02	No



**Table 10:** Stop length, controlling for extended stops

	Difference (in minutes)	t-statistic	Statistically significant?
High-Volume: Hispanic vs. White	0.980	1.87	No
Low-Volume: Hispanic vs. White	-2.470	-1.27	No
Difference-in-difference	-3.450	-1.72	No
High-Volume: Black vs. White	0.687	1.54	No
Low-Volume: Black vs. White	4.930	2.82	Yes
Difference-in-difference	4.243	2.35	Yes
High-Volume: Minority vs. White	0.850	1.84	No
Low-Volume: Minority vs. White	-0.988	-0.57	No
Difference-in-difference	-1.838	-1.02	No

**Table 11:** Stop length, including extended stops as matching variables

	Difference (in minutes)	t-statistic	Statistically significant?
High-Volume: Hispanic vs. White	-0.290	-0.54	No
Low-Volume: Hispanic vs. White	0.560	-0.28	No
Difference-in-difference	0.850	-0.41	No
High-Volume: Black vs. White	1.013	2.35	Yes
Low-Volume: Black vs. White	5.081	3.02	Yes
Difference-in-difference	4.068	2.34	Yes
High-Volume: Minority vs. White	-0.099	-0.21	No
Low-Volume: Minority vs. White	1.123	0.63	No
Difference-in-difference	1.223	0.66	No

**Table 12: Stop length, only extended stops**

	Difference (in minutes)	t-statistic	Statistically significant?
High-Volume: Hispanic vs. White	-1.551	-0.93	No
Low-Volume: Hispanic vs. White	-11.921	-2.40	Yes
Difference-in-difference	-10.371	-1.98	Yes
High-Volume: Black vs. White	-0.533	-0.37	No
Low-Volume: Black vs. White	9.712	1.99	Yes
Difference-in-difference	10.245	2.01	Yes
High-Volume: Minority vs. White	-0.469	-0.32	No
Low-Volume: Minority vs. White	-10.260	-2.27	Yes
Difference-in-difference	-9.790	-2.06	Yes

**Table 13: Stop length, excluding extended stops**

	Difference (in minutes)	t-statistic	Statistically significant?
High-Volume: Hispanic vs. White	0.334	1.99	Yes
Low-Volume: Hispanic vs. White	1.155	1.56	No
Difference-in-difference	0.821	1.08	No
High-Volume: Black vs. White	0.963	4.28	Yes
Low-Volume: Black vs. White	3.192	3.34	Yes
Difference-in-difference	2.229	2.27	Yes
High-Volume: Minority vs. White	0.430	2.61	Yes
Low-Volume: Minority vs. White	1.348	1.88	No
Difference-in-difference	0.919	1.25	No

## Arrests

**Table 14:** All arrests

	Difference (percentage)	t-statistic	Statistically significant?
High-Volume: Hispanic vs. White	1.1	3.07	Yes
Low-Volume: Hispanic vs. White	0.0	-0.01	No
Difference-in-difference	-1.1	-0.81	No
High-Volume: Black vs. White	-0.1	-0.22	No
Low-Volume: Black vs. White	2.1	1.40	No
Difference-in-difference	2.2	1.41	No
High-Volume: Minority vs. White	0.7	2.16	Yes
Low-Volume: Minority vs. White	0.1	0.07	No
Difference-in-difference	-0.6	-0.49	No

**Table 15:** Booked arrests, compared to all other stops

	Difference (percentage)	t-statistic	Statistically significant?
High-Volume: Hispanic vs. White	0.4	2.79	Yes
Low-Volume: Hispanic vs. White	0.7	1.48	No
Difference-in-difference	0.4	0.70	No
High-Volume: Black vs. White	0.4	2.70	Yes
Low-Volume: Black vs. White	1.4	2.28	Yes
Difference-in-difference	1.0	1.54	No
High-Volume: Minority vs. White	0.4	2.92	Yes
Low-Volume: Minority vs. White	0.9	1.88	No
Difference-in-difference	0.5	1.07	No

**Table 16: Booked/custodial arrests, compared to all other stops**

	Difference (percentage)	t-statistic	Statistically significant?
High-Volume: Hispanic vs. White	0.4	2.39	Yes
Low-Volume: Hispanic vs. White	0.9	1.34	No
Difference-in-difference	0.5	0.67	No
High-Volume: Black vs. White	0.5	2.16	Yes
Low-Volume: Black vs. White	3.4	4.14	Yes
Difference-in-difference	2.9	3.47	Yes
High-Volume: Minority vs. White	0.4	2.28	Yes
Low-Volume: Minority vs. White	1.4	2.14	Yes
Difference-in-difference	1.0	1.48	No

**Table 17: Booked arrests compared to cite and release arrests**

	Difference (percentage)	t-statistic	Statistically significant?
High-Volume: Hispanic vs. White	1.6	0.58	No
Low-Volume: Hispanic vs. White	13.3	1.17	No
Difference-in-difference	11.7	1.01	No
High-Volume: Black vs. White	11.6	3.78	Yes
Low-Volume: Black vs. White	3.3	0.32	No
Difference-in-difference	-8.3	-0.78	No
High-Volume: Minority vs. White	3.1	1.23	No
Low-Volume: Minority vs. White	17.5	1.70	No
Difference-in-difference	14.4	1.36	No

**Table 18:** Arrests, excluding warrant arrests

	Difference (percentage)	t-statistic	Statistically significant?
High-Volume: Hispanic vs. White	0.8	2.57	Yes
Low-Volume: Hispanic vs. White	<0.1	0.03	No
Difference-in-difference	-0.8	-0.64	No
High-Volume: Black vs. White	-0.9	-2.67	Yes
Low-Volume: Black vs. White	-2.1	-1.55	No
Difference-in-difference	-1.2	-0.86	No
High-Volume: Minority vs. White	0.3	0.95	No
Low-Volume: Minority vs. White	-0.9	-0.79	No
Difference-in-difference	-1.2	-1.00	No

## Citations

**Table 19:** Citations, no offense categories or speed used as matching variables (previous baseline)

	Difference (percentage)	t-statistic	Statistically significant?
High-Volume: Hispanic vs. White	3.2	4.07	Yes
Low-Volume: Hispanic vs. White	-1.5	-0.54	No
Difference-in-difference	-4.7	-1.58	No
High-Volume: Black vs. White	-0.5	-0.56	No
Low-Volume: Black vs. White	4.8	1.42	No
Difference-in-difference	5.3	1.52	No
High-Volume: Minority vs. White	2.4	3.26	Yes
Low-Volume: Minority vs. White	-1.4	-0.51	No
Difference-in-difference	-3.8	-1.33	No

**Table 20:** Citations, offense categories and speed as matching variables

	Difference (percentage)	t-statistic	Statistically significant?
High-Volume: Hispanic vs. White	2.2	2.84	Yes
Low-Volume: Hispanic vs. White	-0.5	-0.16	No
Difference-in-difference	-2.7	-0.89	No
High-Volume: Black vs. White	-1.6	-1.90	No
Low-Volume: Black vs. White	2.0	0.60	No
Difference-in-difference	3.7	1.05	No
High-Volume: Minority vs. White	1.3	1.84	No
Low-Volume: Minority vs. White	-1.5	-0.54	No
Difference-in-difference	-2.8	-0.99	No

## Searches

**Table 21:** Searches

	Difference (percentage)	t-statistic	Statistically significant?
High-Volume: Hispanic vs. White	0.6	4.16	Yes
Low-Volume: Hispanic vs. White	0.6	1.19	No
Difference-in-difference	0.0	0.06	No
High-Volume: Black vs. White	0.2	1.49	No
Low-Volume: Black vs. White	-0.8	-1.59	No
Difference-in-difference	-1.0	-1.91	No
High-Volume: Minority vs. White	0.4	3.38	Yes
Low-Volume: Minority vs. White	0.2	0.34	No
Difference-in-difference	-0.2	-0.53	No

## Summary

**Table 22:** Summary of Difference-in-Difference Results, Alternate Models

Table	HVH- HVW	LVH- LVW	H/W DID	HVB- HVW	LVB- LVW	B/W DID	HVM- HVW	LVM- LVW	M/W DID
1	-	-	-	-	Yes (+)	Yes (+)	-	-	-
2	-	-	-	-	Yes (+)	Yes (+)	-	-	-
3	-	-	-	Yes (+)	Yes (+)	Yes (+)	-	-	-
4	-	Yes (-)	Yes (-)	-	-	-	-	Yes (-)	Yes (-)
5	Yes (+)	-	-	Yes (+)	Yes (+)	-	Yes (+)	-	-
6	-	-	-	Yes (+)	-	-	-	-	-
7	Yes (+)	-	-	Yes (-)	-	-	-	-	-
8	Yes (+)	-	-	-	-	-	Yes (+)	-	-
9	-	-	-	-	Yes (+)	Yes (+)	-	-	-
10	-	-	-	-	Yes (+)	Yes (+)	-	-	-
11	-	-	-	Yes (+)	Yes (+)	Yes (+)	-	-	-
12	-	Yes (-)	Yes (-)	-	Yes (+)	Yes (+)	-	Yes (-)	Yes (-)
13	Yes (+)	-	-	Yes (+)	Yes (+)	Yes (+)	Yes (+)	-	-
14	Yes (+)	-	-	-	-	-	Yes (+)	-	-
15	Yes (+)	-	-	Yes (+)	Yes (+)	-	Yes (+)	-	-
16	Yes (+)	-	-	Yes (+)	Yes (+)	Yes (+)	Yes (+)	Yes (+)	-
17	-	-	-	Yes (+)	-	-	-	-	-
18	Yes (+)	-	-	Yes (-)	-	-	-	-	-
19	Yes (+)	-	-	-	-	-	Yes (+)	-	-
20	Yes (+)	-	-	-	-	-	-	-	-
21	Yes (+)	-	-	Yes (+)	-	-	-	-	-



Table 23: List of Propensity Score Matching Difference-in-Difference Models

Excluding Special Assignments as Matching Variables	Table 1	Stop length, all stops
	Table 2	Stop length, controlling for extended stops
	Table 3	Stop length, including extended stops as matching variables
	Table 4	Stop length, only extended stops
	Table 5	Booked arrests, compared to all other stops
	Table 6	Booked arrests compared to cite and release arrests
	Table 7	Arrests, excluding warrant arrests
	Table 8	Citations, no offense categories or speed used as matching variables (previous baseline)
Including Special Assignments as Matching Variables	Table 9	Stop length, all stops
	Table 10	Stop length, controlling for extended stops
	Table 11	Stop length, including extended stops as matching variables
	Table 12	Stop length, only extended stops
	Table 13	Stop length, excluding extended stops
	Table 14	All arrests
	Table 15	Booked arrests, compared to all other stops
	Table 16	Booked/custodial arrests, compared to all other stops
	Table 17	Booked arrests compared to cite and release arrests
	Table 18	Arrests, excluding warrant arrests
	Table 19	Citations, no offense categories or speed used as matching variables (previous baseline)
	Table 20	Citations, offense categories and speed as matching variables
	Table 21	Searches