

APPENDIX A TO PART 1340

STATE SEAT BELT USE SURVEY REPORTING FORM

PART A: To be completed by the Governor's Highway Safety Representative (GR) or if applicable, the Coordinator of the State Highway Safety Office.

State: MICHIGAN

Calendar Year of Survey: 2025

Statewide Seat Belt Use Rate: 93.2%

I hereby certify that:

- Alicia Sledge has been designated by the Governor as the State's Highway Safety Representative (GR), and if applicable, the GR has delegated the authority to sign the certification in writing to Alicia Sledge, the Coordinator of the State Highway Safety Office.
- The reported Statewide seat belt use rate is based on a survey design that was approved by NHTSA, in writing, as conforming to the Uniform Criteria for State Observational Surveys of Seat Belt Use, 23 CFR Part 1340.
- The survey design has remained unchanged since the survey was approved by NHTSA.
- Peter Savolainen, a qualified survey statistician, has reviewed the seat belt use rate reported above and information reported in Part B and has determined that they meet the Uniform Criteria for State Observational Surveys of Seat Belt Use, 23 CFR Part 1340 .


Digitally signed by Alicia
Sledge
Date: 2025.09.04 11:53:03
-04'00'

September 4, 2025

Signature

Date

Alicia Sledge, Director

Printed name of signing official

PART B

Data Collected at Observation Sites

Site ID	Site Type ¹	Date Observed	Sample Weight	Number of Drivers	Number of Front Passengers	Number of Occupants ² Belted	Number of Occupants Unbelted	Number of Occupants With Unknown Belt Use
1-1	Original	04-JUN-25	75204.50	69	17	79	7	0
1-2	Original	04-JUN-25	151394.38	135	20	141	14	0
1-3	Original	04-JUN-25	44634.41	119	24	135	8	0
1-4	Original	04-JUN-25	41610.79	130	36	152	14	0
2-1	Original	09-JUN-25	119202.68	100	2	99	3	0
2-2	Original	09-JUN-25	101579.28	100	3	99	4	0
2-3	Original	09-JUN-25	2633168.98	4	0	3	1	0
2-4	Original	09-JUN-25	298561.77	82	1	82	1	0
3-1	Original	28-MAY-25	91130.05	101	23	119	5	0
3-2	Original	28-MAY-25	164303.94	120	22	134	8	0
3-3	Original	28-MAY-25	165322.23	104	20	120	4	0
3-4	Original	28-MAY-25	46721.50	27	9	35	1	0
4-1	Original	28-MAY-25	64024.29	36	9	42	3	0
4-2	Original	28-MAY-25	91006.70	104	29	121	12	0
4-3	Original	28-MAY-25	262698.24	106	24	107	23	0
4-4	Original	28-MAY-25	85151.06	110	28	124	14	0
5-1	Original	06-JUN-25	75999.87	115	15	123	7	0
5-2	Original	06-JUN-25	187730.51	120	14	121	13	0
5-3	Original	06-JUN-25	2618199.12	9	4	8	5	0
5-4	Original	06-JUN-25	51986.41	113	33	138	8	0
5-5	Original	06-JUN-25	67795.62	91	9	98	2	0
6-1	Original	07-JUN-25	66694.24	51	9	53	6	1
6-2	Original	07-JUN-25	66672.20	89	20	100	9	0
6-3	Original	07-JUN-25	22048.60	138	25	154	6	3
6-4	Original	07-JUN-25	1918123.57	40	11	47	4	0
6-5	Original	07-JUN-25	67821.11	95	42	125	11	1
7-1	Original	08-JUN-25	133037.49	118	19	121	16	0
7-2	Original	08-JUN-25	21997.56	110	37	132	15	0
7-3	Original	08-JUN-25	48868.75	121	28	123	26	0
7-4	Original	08-JUN-25	36459.90	110	47	142	14	1
8-1	Original	29-MAY-25	61795.30	120	7	117	10	0

¹Identify if the observation site is an original observation site or an alternate observation site.

² Occupants refer to both drivers and passengers.

8-2	Original	29-MAY-25	1604704.68	15	3	15	3	0
8-3	Original	29-MAY-25	119517.65	120	13	118	15	0
8-4	Original	29-MAY-25	123790.91	120	8	118	10	0
8-5	Original	29-MAY-25	105215.49	119	7	117	9	0
9-1	Original	12-JUN-25	1504410.64	4	1	5	0	0
9-2	Original	12-JUN-25	98551.99	100	2	88	14	0
9-3	Original	12-JUN-25	74274.55	100	5	98	7	0
9-4	Original	12-JUN-25	39090.59	100	1	93	7	1
9-5	Original	12-JUN-25	64648.69	83	3	85	1	0
10-1	Original	29-MAY-25	73560.05	125	14	135	4	0
10-2	Original	29-MAY-25	76838.23	130	18	135	13	0
10-3	Original	29-MAY-25	37269.94	132	19	145	6	0
10-4	Original	29-MAY-25	15486.78	134	17	141	10	0
10-5	Original	29-MAY-25	1778460.24	10	4	11	3	0
10-6	Original	29-MAY-25	11234357.97	142	21	156	7	0
11-1	Original	27-MAY-25	173863.91	96	9	90	15	0
11-2	Original	27-MAY-25	105826.30	120	10	118	12	0
11-3	Original	27-MAY-25	128024.01	110	9	111	8	0
11-4	Original	27-MAY-25	96111.86	110	13	117	6	0
11-5	Original	27-MAY-25	1875467.16	55	6	55	6	0
12-1	Original	02-JUN-25	64356.15	120	8	126	2	0
12-2	Original	02-JUN-25	32436.19	120	13	125	8	0
12-3	Original	02-JUN-25	75583.95	120	11	128	3	0
12-4	Original	02-JUN-25	25911.85	108	17	120	5	0
12-5	Original	02-JUN-25	168686.88	120	15	129	6	0
13-1	Original	30-MAY-25	2633168.98	37	5	40	2	0
13-2	Original	30-MAY-25	137439.08	120	28	144	4	0
13-3	Original	30-MAY-25	65410.10	120	33	146	7	0
13-4	Original	30-MAY-25	58630.90	102	22	120	4	0
13-5	Original	30-MAY-25	76311.78	120	26	137	9	0
14-1	Original	29-MAY-25	6069677.66	118	16	126	8	0
14-2	Original	29-MAY-25	32227.97	120	17	134	3	0
14-3	Original	29-MAY-25	79142.09	120	13	125	8	0
14-4	Original	29-MAY-25	181515.71	87	16	99	4	0
14-5	Original	29-MAY-25	51101.64	96	23	115	4	0
15-1	Original	01-JUN-25	49039.88	40	8	47	1	0
15-2	Original	01-JUN-25	130820.20	120	43	159	4	0
15-3	Original	01-JUN-25	123811.97	120	45	159	6	0
15-4	Original	01-JUN-25	46721.50	71	24	89	6	0
16-1	Original	01-JUN-25	65972.09	110	26	129	6	1
16-2	Original	01-JUN-25	83457.59	110	18	118	10	0
16-3	Original	08-JUN-25	99463.74	87	7	89	5	0
16-4	Original	08-JUN-25	97605.07	100	7	101	5	1

16-5	Original	08-JUN-25	24640.15	93	0	87	6	0
16-6	Original	08-JUN-25	38985.50	67	4	69	2	0
17-1	Original	06-JUN-25	2633168.98	26	4	29	1	0
17-2	Original	06-JUN-25	220270.79	120	18	135	3	0
17-3	Original	06-JUN-25	407255.73	120	14	130	4	0
17-4	Original	06-JUN-25	49685.14	76	12	84	4	0
17-5	Original	06-JUN-25	58174.76	102	17	112	6	1
18-1	Original	07-JUN-25	47476.81	116	19	123	12	0
18-2	Original	07-JUN-25	94783.13	143	41	171	13	0
18-3	Original	07-JUN-25	85280.75	126	38	144	20	0
18-4	Original	07-JUN-25	115788.06	115	33	132	16	0
19-1	Original	30-MAY-25	64098.85	133	20	133	20	0
19-2	Original	30-MAY-25	53281.62	124	20	126	18	0
19-3	Original	30-MAY-25	137122.04	123	12	123	12	0
19-4	Original	30-MAY-25	73285.95	133	15	135	13	0
19-5	Original	30-MAY-25	59234.21	112	12	115	9	0
20-1	Original	30-MAY-25	35533.24	113	21	128	6	0
20-2	Original	30-MAY-25	32430.91	130	34	149	15	0
20-3	Original	30-MAY-25	44668.89	120	31	145	6	0
20-4	Original	30-MAY-25	54868.62	125	20	120	25	0
20-5	Original	30-MAY-25	38783.72	120	19	126	13	0
21-1	Original	28-MAY-25	23164.94	104	3	98	9	0
21-2	Original	28-MAY-25	85442.69	119	7	121	5	0
21-3	Original	28-MAY-25	73913.99	120	7	119	8	0
21-4	Original	28-MAY-25	58551.84	117	4	102	19	0
21-5	Original	28-MAY-25	62705.40	115	7	111	11	0
21-6	Original	28-MAY-25	1654851.71	30	3	29	4	0
22-1	Original	31-MAY-25	40395.63	96	10	80	26	0
22-2	Original	31-MAY-25	15872.10	107	8	96	17	2
22-3	Original	31-MAY-25	47567.09	80	19	86	13	0
22-4	Original	31-MAY-25	28420.30	85	7	74	18	0
23-1	Original	04-JUN-25	162324.35	108	2	103	7	0
23-2	Original	09-JUN-25	27577.41	87	3	85	4	1
23-3	Original	09-JUN-25	2005880.86	24	4	22	6	0
23-4	Original	09-JUN-25	78960.29	97	4	84	15	2
24-1	Original	02-JUN-25	53428.80	124	9	121	12	0
24-2	Original	02-JUN-25	46886.61	117	13	108	21	1
24-3	Original	02-JUN-25	89668.75	138	11	137	12	0
24-4	Original	02-JUN-25	128084.05	112	19	123	8	0
24-5	Original	02-JUN-25	196942.77	129	10	128	11	0
25-1	Original	03-JUN-25	2749109.08	18	1	18	1	0
25-2	Original	03-JUN-25	36715.40	136	16	146	6	0
25-3	Original	03-JUN-25	68571.64	137	26	154	9	0

25-4	Original	03-JUN-25	35906.43	135	17	145	7	0
26-1	Original	28-MAY-25	108460.62	112	10	111	11	0
26-2	Original	28-MAY-25	85500.34	100	20	110	10	0
26-3	Original	28-MAY-25	80525.57	138	12	141	9	0
26-4	Original	28-MAY-25	15526.18	131	17	135	13	0
27-1	Original	09-JUN-25	53414.73	21	1	21	1	0
27-2	Original	09-JUN-25	36446.37	133	11	140	4	0
27-3	Original	09-JUN-25	11005.25	91	6	84	13	0
27-4	Original	09-JUN-25	13501.29	130	17	140	7	0
27-5	Original	09-JUN-25	11356.97	30	1	30	1	0
27-6	Original	09-JUN-25	10853.98	39	8	41	6	0
28-1	Original	02-JUN-25	147541.58	57	4	55	6	0
28-2	Original	02-JUN-25	68507.47	96	4	89	11	0
28-3	Original	02-JUN-25	41049.13	70	5	72	3	0
28-4	Original	02-JUN-25	139720.04	98	6	94	10	0
29-1	Original	05-JUN-25	52542.73	14	2	15	1	0
29-2	Original	05-JUN-25	52812.18	39	6	41	4	0
29-3	Original	05-JUN-25	101118.67	140	16	141	15	0
29-4	Original	05-JUN-25	51524.64	107	15	110	12	0
29-5	Original	05-JUN-25	57724.02	96	20	108	8	0
30-1	Original	03-JUN-25	102521.64	97	6	100	3	0
30-2	Original	03-JUN-25	72243.37	92	6	96	2	0
30-3	Original	03-JUN-25	66902.87	100	6	99	7	0
30-4	Original	03-JUN-25	2045229.27	20	1	20	1	0
30-5	Original	03-JUN-25	27713.18	95	2	94	3	0
31-1	Original	31-MAY-25	44577.84	110	18	118	10	0
31-2	Original	31-MAY-25	84726.71	110	17	120	7	0
31-3	Original	31-MAY-25	5010469.70	104	34	132	6	0
31-4	Original	31-MAY-25	82455.22	110	25	131	4	0
31-5	Original	31-MAY-25	56690.98	110	5	115	0	0
32-1	Original	01-JUN-25	134760.91	120	15	133	2	0
32-2	Original	01-JUN-25	37735.28	120	28	137	11	0
32-3	Original	01-JUN-25	49959.62	101	24	116	9	0
32-4	Original	01-JUN-25	144836.65	90	3	88	5	0
33-1	Original	07-JUN-25	170922.82	120	34	147	7	0
33-2	Original	07-JUN-25	133490.00	120	22	132	9	1
33-3	Original	07-JUN-25	2633168.98	9	3	11	1	0
33-4	Original	07-JUN-25	57213.19	72	30	101	1	0
33-5	Original	07-JUN-25	69064.50	120	34	148	6	0
34-1	Original	28-MAY-25	123008.95	128	7	122	13	0
34-2	Original	28-MAY-25	34251.77	137	10	139	8	0
34-3	Original	28-MAY-25	20754.39	98	8	104	2	0
34-4	Original	28-MAY-25	40322.52	127	13	131	9	0

34-5	Original	28-MAY-25	32753.64	116	8	112	12	0
35-1	Original	29-MAY-25	113772.42	109	16	111	13	1
35-2	Original	29-MAY-25	270878.09	90	15	95	10	0
35-3	Original	29-MAY-25	129827.46	100	10	106	3	1
35-4	Original	29-MAY-25	2356379.21	19	5	23	1	0
36-1	Original	01-JUN-25	17099.98	96	27	119	4	0
36-2	Original	01-JUN-25	19454.46	121	12	125	8	0
36-3	Original	01-JUN-25	40142.13	122	19	136	5	0
36-4	Original	01-JUN-25	35877.15	73	7	75	5	0
37-1	Original	02-JUN-25	2356379.21	12	2	13	1	0
37-2	Original	02-JUN-25	4879371.09	100	18	108	9	1
37-3	Original	02-JUN-25	68994.02	21	5	25	1	0
37-4	Original	02-JUN-25	37973.56	108	22	109	20	1
37-5	Original	02-JUN-25	48021.42	105	19	115	9	0
38-1	Original	27-MAY-25	38218.37	114	25	131	8	0
38-2	Original	27-MAY-25	71187.09	120	8	120	8	0
38-3	Original	27-MAY-25	46737.89	17	1	16	2	0
38-4	Original	27-MAY-25	42441.66	109	12	111	10	0
38-5	Original	27-MAY-25	70734.20	118	14	129	3	0
39-1	Original	05-JUN-25	78020.23	112	20	120	12	0
39-2	Original	05-JUN-25	57893.27	115	14	127	2	0
39-3	Original	05-JUN-25	60586.15	27	7	30	4	0
39-4	Original	05-JUN-25	72231.28	55	14	67	2	0
39-5	Original	05-JUN-25	70873.52	134	41	167	8	0
40-1	Original	05-JUN-25	96795.15	88	14	98	4	0
40-2	Original	05-JUN-25	10424.75	104	18	117	4	1
40-3	Original	05-JUN-25	24778.84	120	19	133	6	0
40-4	Original	05-JUN-25	15830.93	75	22	93	4	0
40-5	Original	05-JUN-25	15257.34	92	19	95	14	2
40-6	Original	05-JUN-25	37220.32	120	29	144	4	1
41-1	Original	05-JUN-25	85747.69	170	14	182	2	0
41-2	Original	05-JUN-25	35435.30	220	20	238	2	0
41-3	Original	05-JUN-25	29115.14	200	4	194	10	0
41-4	Original	05-JUN-25	30061.80	128	6	132	2	0
41-5	Original	05-JUN-25	53359.72	200	6	200	6	0
42-1	Original	07-JUN-25	69722.85	130	13	134	9	0
42-2	Original	07-JUN-25	50986.79	44	14	56	2	0
42-3	Original	07-JUN-25	53039.62	89	33	122	0	0
42-4	Original	07-JUN-25	51771.20	65	18	83	0	0
42-5	Original	07-JUN-25	47625.67	129	30	157	2	0
Total				19,909	2,977	21,336	1,525	25

Standard Error of Statewide Belt Use Rate³: 0.4%

Nonresponse Rate, as provided in § 1340.9(f)

Nonresponse rate for the survey variable seat belt use: 0.11%

³ The standard error may not exceed 2.5 percent.

June 30, 2025

JUNE 2025 DIRECT SAFETY BELT AND MOBILE DEVICE OBSERVATION SURVEY

Prepared for:
Office of Highway Safety Planning
Lansing, MI

Prepared by:
Michigan State University
East Lansing, MI

Statewide Weighted Safety Belt Use Rate

Observational Wave	Total Observations			Weighted Percent of Safety Belt Use	Standard Error
	Driver	Passenger	Total		
June 2025	19,887	2,974	22,861	93.2%	0.4%

Unweighted Safety Belt Use Rates by Stratum

Stratum	Total Observations			Unweighted Percent of Safety Belt Use
	Driver	Passenger	Total	
1	5,403	619	6,022	94.7%
2	4,805	809	5,614	94.1%
3	4,579	918	5,497	93.9%
4	5,100	628	5,728	90.6%

Statewide Weighted Driver All Mobile Device Use Rate

Observational Wave	Total Observations (Driver Only)	Weighted Percent of All Mobile Device Use	Standard Error
June 2025	19,887	7.2%	0.4%

Unweighted Driver All Mobile Device Use Rates by Stratum

Stratum	Total Observations (Driver Only)	Unweighted Percent of All Mobile Device Use
1	5,403	7.9%
2	4,805	5.7%
3	4,579	5.5%
4	5,100	8.0%

Statewide Weighted Driver Handheld Mobile Device Use Rate

Observational Wave	Total Observations (Driver Only)	Weighted Percent of Handheld Mobile Device Use	Standard Error
June 2025	19,887	5.7%	0.3%

Unweighted Driver Handheld Mobile Device Use Rates by Stratum

Stratum	Total Observations (Driver Only)	Unweighted Percent of Handheld Mobile Device Use
1	5,403	5.4%
2	4,805	4.6%
3	4,579	4.5%
4	5,100	6.8%

2025 ANNUAL DIRECT OBSERVATION SURVEY OF SEAT BELT USE AND MOBILE DEVICE USE IN MICHIGAN



FINAL REPORT

**Prepared for:
Michigan Office of Highway Safety Planning
Lansing, MI**

**Prepared by:
Michigan State University
East Lansing, MI**

Date: July 17, 2025



**MICHIGAN STATE
UNIVERSITY**

2025 ANNUAL DIRECT OBSERVATION SURVEY OF SEAT BELT USE AND MOBILE DEVICE USE IN MICHIGAN

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The opinions, findings, and conclusions expressed in this publication are those of the author(s) and not necessarily those of the Michigan Office of Highway Safety Planning, the U.S. Department of Transportation, or the National Highway Traffic Safety Administration. This report was prepared in cooperation with the Michigan Office of Highway Safety Planning, the U.S. Department of Transportation, and the National Highway Traffic Safety Administration.

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		6. Performing Organization Code:	
7. Author(s) Timothy J. Gates, Peter T. Savolainen, Brendan J. Russo, Jonathan J. Kay, Sagar Keshari, and Sakar Pahari		8. Performing Organization Report No.	
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15. Supplementary Notes:			
16. Abstract: This report documents the methods and results of the 2025 Annual Direct Observation Survey of Seat Belt Use and Mobile Device Use in the State of Michigan. Seat belt use by drivers and front-seat passengers was observed at a total of 200 intersection/interchange sites within 35 counties throughout Michigan during late May and June 2025. In addition to belt use, data were collected for vehicle type and use, as well as the gender, age, and race for each observed front-seat occupant, along with mobile device use for each driver. Seat belt use was assessed for a total of 22,861 front-seat occupants along with 19,887 assessments of mobile device use by drivers. Based on these data, the weighted seat belt use rate in Michigan for 2025 is 93.2 percent. This represents an increase in seat belt use rate compared to the 2024 rate of 92.0 percent. Males and younger occupants, specifically those in pickup trucks, continue to exhibit lower seat belt use rates. Considering only handheld uses of mobile devices (e.g., talking, typing), the weighted rate of handheld mobile device use by Michigan drivers in 2025 is 5.7 percent. This represents a marginal increase from 5.5 percent in 2024, but a statistically significant decrease from the 6.7 percent rate of handheld device use observed in Michigan in 2023 prior to the distracted-driving law going into effect. Handheld use of mobile devices remains highest among younger drivers.			
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1.0 INTRODUCTION

The use of seat belts is the single most effective means of reducing fatal and non-fatal injuries in motor vehicle crashes. In 2024 alone, a statistical projection estimated 39,345 people were killed in motor vehicle crashes in the United States, representing a decrease of 3.8 percent compared to the 40,901 fatalities reported to have occurred in 2023 [1]. Considering passenger vehicle occupants involved in fatal traffic crashes in 2023, about half (49 percent) of those killed were unrestrained [2]. Restraint use was even less likely in passenger vehicle occupant fatalities if the occupant was in a pickup truck (59 percent unrestrained), between ages 13 to 14 or 25 to 34 (61 percent unrestrained), traveling at night (56 percent unrestrained), or male (53 percent unrestrained) [2]. The National Highway Traffic Safety Administration (NHTSA) has estimated that the use of lap/shoulder seat belts by front-seat occupants reduces the risk of fatal injuries by approximately 45 percent for passenger cars and 60 percent for light trucks [2]. Moreover, the use of lap/shoulder seat belts by front-seat occupants reduces the risk of moderate to critical injury by 50 percent for passenger cars and 65 percent for light trucks [2]. A study conducted by the NHTSA on the economic and societal impacts of motor vehicle crashes estimated that from 1975 to 2019, seat belts have prevented over 403,000 fatalities and \$2.5 trillion in medical care, lost productivity, and other injury-related economic costs [3]. During the same time period, over 390,000 additional fatalities could have been prevented by the use of seat belts [3]. In 2019 alone, seat belts prevented approximately 14,653 fatalities and could have saved an additional 2,400 people if they were properly belted [3].

In light of these facts, continuing efforts have been aimed at increasing the use of seat belts across the United States. According to the 2024 National Occupant Protection Use Survey (NOPUS), 91.2 percent of drivers and right-front passengers used seat belts, which is a 0.7 percentage point decrease (not a statistically significant change) from the 91.9 percent observed in 2023 [4]. The Midwest region as a whole showed a 91.7 percent seat belt use rate in 2024, which was a decrease from the 92.9 percent seat belt use rate observed in 2023 [4]. In Michigan, past studies indicate that the overall annual seat belt use rate among front-seat occupants has ranged between 92.4 percent and 94.5 percent between 2013 and 2024. In 2023, which is the most recent year that seat belt use data are available for individual states, Michigan was one of 27 states with a seat belt use rate exceeding 90 percent [5]. Michigan is currently one of the 35 “primary law” states, where a front-seat occupant motorist can be stopped and cited for the sole reason of not wearing a seat belt. The most recently available nationwide statistics (2024) indicate that states with primary seat belt laws had an average seat belt use rate of 91.7 percent, which is 2.5 percent higher than the 89.2 percent observed in states without primary seat belt laws [4].

As the non-use of seat belts is ultimately a behavioral issue, targeted programs aimed at changing belt use behavior of vehicular occupants who are most prone to low belt use rates represent an important tool towards increasing use rates. To that end, identification of demographic characteristics related to low belt use is a primary goal of state belt use surveys. Other uses of state seat belt use include:

- To fulfill reporting requirements to the NHTSA;
- To allocate statewide safety funding to specific program areas;
- To provide targeted funding to areas where belt use is lower than the statewide average; and
- To provide targeted programs for certain segments of the population.

1.1 Study Purpose and Objectives

The purpose of the 2025 Annual Direct Observation Survey (referred to hereafter as the “Annual Survey”) was to determine the percentage of Michigan drivers and front-seat passengers who were utilizing their seat belts along with the percentage of drivers using mobile devices. Additional objectives were as follows:

- Implement the methodology for estimating Michigan seat belt use in an economically feasible manner that is compliant with the Uniform Criteria for State Observational Surveys of Seat Belt Use published in the *Federal Register Vol. 76, No. 63* (April 1, 2011, Rules and Regulations, pp. 18042 – 18059);
- Provide training to all staff conducting the observation surveys and conduct quality assurance/quality control (QA/QC) of the data collection efforts;
- Conduct an observational survey of seat belt use for the three week period immediately following the Memorial Day holiday;
- Summarize and cross-tabulate the observational data in a spreadsheet format indicating overall seat belt use, seat belt use by strata, seat belt use by time of day and day of week, and seat belt use by various demographic characteristics; and
- Continue to track annual changes in seat belt use and generate necessary comparative data analyses and visual aids depicting trends.

1.2 Study Area

The study area for the Annual Survey included those counties representing at least 85 percent of the passenger vehicle fatalities according to Fatality Analysis Reporting System (FARS) data averages for the years 2016 to 2020, which was the data analysis period required for site resampling prior to the 2023 survey. Michigan is comprised of 83 counties, 38 of which account for at least 85 percent of the passenger vehicle crash-related fatalities according to FARS data averages for the years 2016 to 2020. Therefore, observation locations from within these 38 counties were eligible to be selected for inclusion in the survey. As required by the NHTSA, Michigan will update the sample of data collection sites every five years in order to have survey results that represent the geographic areas with at least 85 percent of crash-related fatalities.

2.0 SAMPLING METHOD

In 2011, the NHTSA issued new Uniform Criteria for State Observational Surveys of Seat Belt Use in *Federal Register Vol. 76, No. 63* (April 1, 2011, Rules and Regulations, pp. 18042 – 18059). The current methodological approach was prepared for the state of Michigan as a part of the 2013 Direct Observation

Seat Belt Survey and was subsequently approved by the NHTSA. The methodology was employed during the sampling of locations used in the surveys performed during the five-year period of 2013-2017. However, the federal criteria also requires that states resample the observation locations using the approved methodology at least every five years. Thus, the 200 primary and 200 alternative observation sites were resampled for the 2023-2027 Michigan seat belt surveys. It should be noted that observation sites had most recently been resampled in 2018 for the five-year period between 2018-2022. This resampling task was performed by Michigan State University based on the aforementioned NHTSA-approved methodology for the state of Michigan (developed in 2013), using updated FARS and vehicle miles traveled (VMT) data. The methodology and lists of 200 primary and 200 alternative sites for the 2023-2027 surveys were approved by the NHTSA in early 2023. Please refer to Appendix II for the resumes of the principal investigators, Dr. Timothy Gates and Dr. Peter Savolainen, who, in addition to leading the resampling effort for the 2023-2027 surveys, also led development of the methodological approach for the state of Michigan as a part of the FY2013 seat belt survey. The following sections provide details of the sampling process.

2.1 General Approach

The study approach includes a stratified systematic probability proportional to size (PPS) sample of data collection sites as described here:

1. All 83 counties in Michigan were listed in descending order of the average number of motor vehicle crash-related fatalities for the period from 2016 to 2020. FARS data were used to determine the average number of crash-related fatalities per county. It was determined 38 counties accounted for at least 85 percent of Michigan's total crash-related fatalities during this period as shown in Table 1, along with VMT. These 38 counties comprise the sample frame from which the survey observation locations would be selected, which is displayed in Figure 1.
2. The counties were stratified according to historical seat belt use rates into four strata. These strata were constructed such that the annual VMT were approximately balanced within each of the four groups. This represents the first stage of sample selection.
3. At the second stage, the MAF/TIGER Feature Class Code (MTFCC, see Section 2.2) was used to classify all road segments into three explicit classifications: 1.) Primary Roads, 2.) Secondary Roads, and 3.) Local Roads. This resulted in a total of 12 strata (4 belt use strata, each with 3 MTFCC classes). The number of sites within each MTFCC class was determined proportionately based upon historical VMT, resulting in 30 percent primary roads, 60 percent secondary roads, and 10 percent local roads.
4. Road segments were then implicitly stratified by county and segment length. Specific segments were selected randomly with PPS from all segments within each stratum. A random, systematic

sample of 50 road segments was selected PPS to road segment length within each belt use group. This process resulted in the selection of 200 road segments (4 belt use rate groups, each with 50 sites) allocated proportionately among MTFCC classes. An additional 200 sites were also selected to use as alternates. Ultimately, the final set of observation sites included 35 counties out of the 38 initially identified within the sample frame, as no sites were selected in Hillsdale, Ionia, and Osceola counties.

5. Based on past experience with the Michigan annual seat belt surveys, it was expected that each site would yield a sample size of 125 vehicles, thereby resulting in an expected 25,000 total vehicle observations. Based on this value, the standard error was expected to be less than 2.5 percent. In the event the calculated standard error should be greater than 2.5 percent, additional data would be collected from existing sites until this criterion was satisfied.
6. Additional stages of selection were used to determine travel direction, lane, day of week, time of day, and vehicles to be observed, at random and with known probability, as appropriate under the Uniform Criteria, as described in Section 2.4.

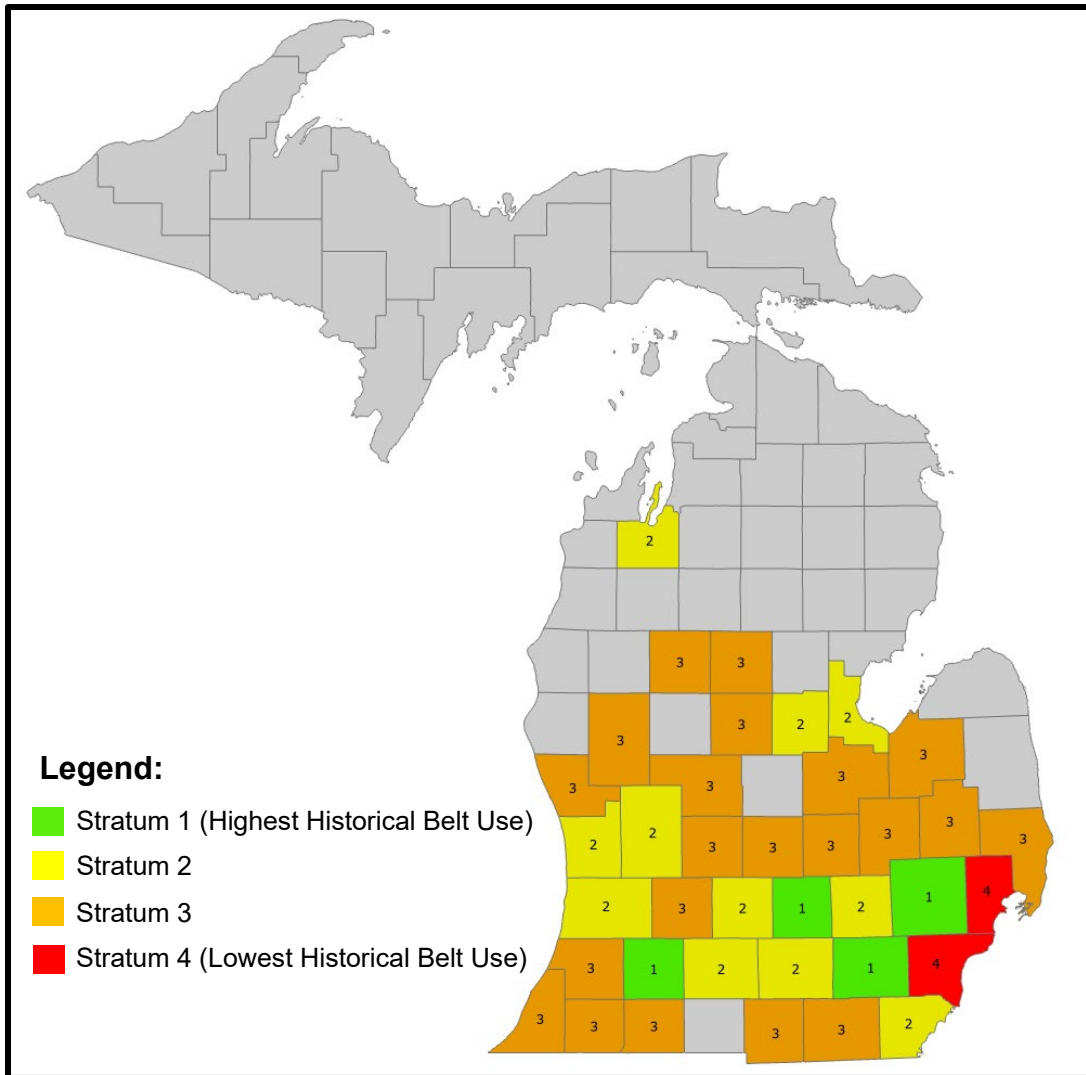


Figure 1. 38-County Sample Frame for the Annual Direct Observation Seat Belt Survey

Table 1. Michigan Average Motor Vehicle Crash-Related Fatalities by County (2016-2020)

County	Fatalities (2016-2020)			Vehicle Miles Traveled (Billions)					
	Mean	Percent	Cumulative	2016	2017	2018	2019	2020	VMT
Wayne	106.0	16.2%	16.2%	15.52	15.80	15.94	15.80	12.73	15.16
Kent	39.0	5.9%	22.2%	5.97	6.13	6.17	6.11	5.20	5.92
Oakland	36.0	5.5%	27.6%	12.94	13.08	13.05	13.08	10.63	12.56
Genesee	28.2	4.3%	31.9%	4.07	4.15	4.14	4.14	3.53	4.01
Macomb	25.2	3.8%	35.8%	6.46	6.37	6.64	6.78	5.77	6.40
Kalamazoo	20.2	3.1%	38.9%	2.51	2.66	2.64	2.62	2.17	2.52
Washtenaw	17.4	2.7%	41.5%	3.66	3.83	4.04	3.95	3.18	3.73
Ottawa	15.8	2.4%	43.9%	2.42	2.48	2.51	2.53	2.20	2.43
Monroe	14.4	2.2%	46.1%	2.03	2.05	2.05	2.04	1.67	1.97
Berrien	14.0	2.1%	48.2%	1.99	2.05	2.07	2.10	1.87	2.02
Calhoun	13.8	2.1%	50.4%	1.72	1.84	1.82	1.76	1.42	1.71
Muskegon	13.8	2.1%	52.5%	1.54	1.57	1.56	1.54	1.32	1.51
Saginaw	13.6	2.1%	54.5%	2.19	2.20	2.17	2.15	1.86	2.12
Livingston	13.0	2.0%	56.5%	2.35	2.40	2.43	2.43	2.05	2.33
St. Clair	12.6	1.9%	58.4%	1.56	1.65	1.54	1.52	1.36	1.53
Ingham	12.2	1.9%	60.3%	2.35	2.41	2.39	2.35	1.93	2.29
Van Buren	12.2	1.9%	62.1%	1.05	1.09	1.10	1.09	0.95	1.05
Allegan	11.0	1.7%	63.8%	1.44	1.53	1.52	1.50	1.38	1.47
Jackson	10.4	1.6%	65.4%	1.71	1.77	1.75	1.74	1.44	1.68
St. Joseph	10.4	1.6%	67.0%	0.56	0.56	0.51	0.50	0.46	0.52
Montcalm	10.0	1.5%	68.5%	0.60	0.63	0.63	0.65	0.59	0.62
Eaton	9.8	1.5%	70.0%	1.25	1.29	1.29	1.30	1.08	1.24
Isabella	8.2	1.2%	71.3%	0.70	0.71	0.71	0.74	0.65	0.70
Clinton	7.6	1.2%	72.4%	1.15	1.18	1.18	1.17	0.98	1.13
Lenawee	7.6	1.2%	73.6%	0.92	0.93	0.93	0.87	0.75	0.88
Lapeer	7.4	1.1%	74.7%	0.94	0.97	0.98	1.00	0.88	0.95
Shiawassee	7.4	1.1%	75.8%	0.79	0.86	0.86	0.85	0.69	0.81
Cass	7.2	1.1%	76.9%	0.47	0.49	0.49	0.49	0.42	0.47
Newaygo	7.2	1.1%	78.0%	0.41	0.40	0.40	0.38	0.35	0.39
Tuscola	6.6	1.0%	79.0%	0.53	0.54	0.53	0.53	0.45	0.51
Midland	6.4	1.0%	80.0%	0.89	0.92	0.94	0.92	0.80	0.89
Grand Traverse	6.2	0.9%	81.0%	0.95	0.93	1.00	1.03	0.91	0.96
Barry	5.8	0.9%	81.8%	0.44	0.45	0.44	0.42	0.37	0.42
Bay	5.6	0.9%	82.7%	1.23	1.24	1.26	1.28	1.12	1.23
Ionia	5.6	0.9%	83.5%	0.82	0.85	0.83	0.82	0.69	0.80
Osceola	4.6	0.7%	84.2%	0.38	0.40	0.40	0.41	0.37	0.39
Hillsdale	4.4	0.7%	84.9%	0.39	0.41	0.41	0.41	0.37	0.40
Clare	4.2	0.6%	85.6%	0.37	0.41	0.39	0.39	0.37	0.39

2.2 Road Segment Stratification

Using 2021 Topologically Integrated Geographic Encoding and Referencing (TIGER) data developed by the U.S. Census Bureau, a comprehensive list of road segments from within these 38 counties was created. Each of these road segments has been classified by the U.S. Census Bureau using the MAF/TIGER Feature Class Code (MTFCC). There are primarily three classifications: (1) Primary Roads, (2) Secondary Roads, and (3) Local Roads (see Table 2 for detailed definitions). In addition, the listings include segment length as determined by TIGER. This descriptive information allowed for stratification of road segments. A systematic probability proportional to size (PPS) sample was employed to select the road segments to be used as observation sites.

Table 2. Michigan MAF/TIGER Feature Class Codes Included in the Road Segment File

Code	Name	Definition
S1100	Primary Road	Primary roads are limited-access highways that connect to other roads only at interchanges and not at at-grade intersections. This category includes interstate highways, as well as all other highways with limited access (some of which are toll roads). Limited-access highways with only one lane in each direction, as well as those that are undivided, are also included under S1100.
S1200	Secondary Road	Secondary roads are main arteries that are not limited-access, usually in the U.S. highway, state highway, or county highway systems. These roads have one or more lanes of traffic in each direction, may or may not be divided, and usually have at-grade intersections with many other roads and driveways. Secondary roads often have both a local name and a route number.
S1400	Local Neighborhood Road, Rural Road, City Street	A paved (privately or publicly maintained) non-arterial street, road, or byway that usually has a single lane of traffic in each direction. Scenic park roads would be included in this feature class, as would (depending on the region of the country) some unpaved roads.

2.3 Selection of Road Segments

Within each of the four belt use strata, a total of 50 road segments were selected. Michigan employed the Census TIGER EDGES data set for the selection of road segments. Michigan exercised the available exclusion option and removed rural local roads in counties not within metropolitan statistical areas (MSAs) and other non-public roads, unnamed roads, unpaved roads, vehicular trails, access ramps, cul-de-sacs, traffic circles, and service drives from the dataset. The number of road segments selected within each MTFCC class was determined proportionately based upon total annual VMT within the three classes (primary, secondary, and local). Thus, the segments selected ultimately included 15 primary roads (20 percent of sample), 30 secondary roads (60 percent of sample), and 5 local roads (10 percent of sample).

Prior to selecting the specific observation locations, all road segments were explicitly stratified by MTFCC (primary, secondary, and local) within each of the four belt use rate groups and implicitly stratified by county and by segment length to obtain an ordered list. Implicit stratification by county was done to ensure

adequate geographic coverage was obtained as a part of the selection process. Similarly, the implicit stratification by length ensured representative coverage within each MTFCC class since higher-class roads tended to be longer than lower-class roads. Specific road segments were then selected with PPS using segment length as the measure of selection (MOS). As such, the inclusion probability for a specific road segment is:

$$\pi_{h|gc} = n_{gc} l_h / \sum_{\forall h} l_h,$$

where n_{gc} is the road segment sample size for MTFCC c in stratum g that was allocated, l_h is the length of road segment h , and

$$\sum_{\forall h} l_h$$

is the total length of all segments in stratum g and MTFCC c .

A random start (RS) was selected between 0 and the calculated I , which determined the first road segment selected. Subsequent road segments selected were determined by adding multiples of I to the RS until the desired number of road segments were selected and/or the end of the sorted list was reached.

Table 3 presents summary statistics detailing the total length (miles) of segments in the sample frame and the number of road segments selected within each of the MTFCC classes by belt use group and county. Ultimately, the final set of observation sites included 35 counties out of the 38 initially identified within the sample frame, as no sites were selected in Hillsdale, Ionia, and Osceola Counties. Appendix III presents the complete list of the final observation sites, including belt use stratum, county, and road classification.

In the event an original road segment was permanently unavailable, a reserve road segment was to be used. The reserve road segment sample consisted of one additional road segment per original road segment selected, resulting in a reserve sample of an additional 200 road segments. These reserve segments were identified and selected as the road segments immediately following the original road segment actually selected. Thus, these segments were also explicitly stratified by seat belt use and MTFCC group, as well as implicitly stratified by segment length and county. Each reserve segment corresponded to an original road segment actually selected. Thus, these are considered selected with PPS using road segment length as MOS by the same approach as described previously. As such, for the purposes of data weighting, the reserve road segment inherited all probabilities of selection and weighting components up to and including the road segment stage of selection from the original road segment actually selected. Probabilities and weights for any subsequent stages of selection (e.g., the sampling of vehicles) would be determined by the reserve road segment itself.

Table 3. Length of Roads in Sample Frame and Count of Selected Sites by County

County	Stratum	Mean Fatalities	Mean VMT	Length of Roads in Sample Frame (Miles)			Count of Selected Sites		
				Primary	Secondary	Local	Primary	Secondary	Local
Wayne	4	106.0	15.16	318.2	218.0	7,507.8	14	18	2
Kent	2	39.0	5.92	198.4	155.1	3,860.6	3	4	1
Oakland	1	36.0	12.56	204.1	193.5	6,746.7	3	9	3
Genesee	3	28.2	4.01	163.5	102.6	2,894.0	1	1	1
Macomb	4	25.2	6.40	89.2	139.7	3,685.8	1	12	3
Kalamazoo	1	20.2	2.52	96.8	74.9	1,986.3	4	7	0
Washtenaw	1	17.4	3.73	148.3	79.7	2,575.7	7	4	2
Ottawa	2	15.8	2.43	80.2	124.9	2,220.8	1	6	0
Monroe	2	14.4	1.97	119.1	83.3	1,664.7	1	1	1
Berrien	3	14.0	2.02	151.3	133.7	2,010.3	2	1	0
Calhoun	2	13.8	1.71	120.1	101.3	1,820.2	1	4	1
Muskegon	3	13.8	1.51	65.1	68.7	1,809.3	0	2	1
Saginaw	3	13.6	2.12	61.2	166.2	2,360.8	0	2	1
Livingston	2	13.0	2.33	105.3	60.1	2,010.0	0	1	0
St. Clair	3	12.6	1.53	107.0	104.1	1,971.0	3	1	0
Ingham	1	12.2	2.29	108.6	112.8	1,924.0	1	10	0
Van Buren	3	12.2	1.05	74.9	84.3	0.0	1	2	0
Allegan	2	11.0	1.47	112.5	83.0	0.0	4	2	0
Jackson	2	10.4	1.68	98.5	110.6	1,930.2	1	2	0
St. Joseph	3	10.4	0.52	0.0	139.4	0.0	0	1	0
Montcalm	3	10.0	0.62	26.2	105.9	1,827.9	0	3	0
Eaton	2	9.8	1.24	77.7	127.3	1,437.0	1	3	1
Isabella	3	8.2	0.70	67.2	36.1	0.0	1	2	0
Clinton	3	7.6	1.13	107.8	45.7	1,356.9	1	1	1
Lenawee	3	7.6	0.88	0.0	152.1	0.0	0	2	0
Lapeer	3	7.4	0.95	49.5	79.8	1,582.3	2	1	1
Shiawassee	3	7.4	0.81	51.2	63.6	1,287.9	1	0	0
Cass	3	7.2	0.47	0.0	126.2	1,181.0	0	1	0
Newaygo	3	7.2	0.39	0.0	104.0	0.0	0	2	0
Tuscola	3	6.6	0.51	0.0	141.4	0.0	0	5	0
Midland	2	6.4	0.89	52.1	45.2	1,249.1	2	0	0
Grand Traverse	2	6.2	0.96	0.0	104.9	0.0	0	4	0
Barry	3	5.8	0.42	0.0	107.3	0.0	0	1	0
Bay	2	5.6	1.23	79.2	97.0	1,340.0	1	3	1
Ionia	3	5.6	0.80	51.0	77.7	1,310.6	0	1	0
Osceola	3	4.6	0.39	50.3	73.6	0.0	0	0	0
Hillsdale	3	4.4	0.40	0.0	108.0	0.0	0	0	0
Clare	3	4.2	0.39	68.4	65.6	0.0	3	1	0
Total			86.11	3,103.0	3,997.1	61,550.7	60	120	20

2.4 Selection and Scheduling of Survey Locations

Road segments were mapped according to the latitude and longitude of their midpoints. The selected road segment was identified by an intersection or interchange that occurred within or just beyond the segment. Data collection sites were deterministically selected such that traffic would be moving during the observation period. Therefore, to capture vehicles moving at a low rate of speed to facilitate accurate data collection, the observation locations along each subject segment were selected to be within 50 to 150 feet upstream of a controlled intersection. For limited-access roadways, data collection locations were selected along the exit ramps. The observed direction of travel was randomly assigned for each road segment.

All belt use observations were conducted during weekdays and weekends between 7 a.m. and 7 p.m. to include rush hour (before 9:30 a.m. and after 3:30 p.m.) and non-rush hour observations. Site assignment schedules, which were provided to the data collectors and quality control monitors, indicated the observed road name, nearest crossroad, GPS coordinates where the observer should stand, assigned date, assigned time, and assigned observation direction. Sites within relatively close geographic proximity were assigned as data collection clusters. In accordance with the uniform seat belt survey criteria, the first site within each cluster was assigned a random day and time for completion. All other sites within a cluster were assigned to the same day and by geographic proximity to minimize travel within the cluster. Approximately five sites were scheduled each day for each data collector. Start times and days were staggered to ensure all days of the week and hours of the day (daylight) were represented in the sample.

2.5 Data Collection Process

Seat belt surveys were performed for exactly 60 minutes at each of the 200 observation locations. The data collected at the 200 observation sites provided a representative sample for each day of the week and each hour of the day between 7 a.m. and 7 p.m. of the statewide seat belt use characteristics. All passenger vehicles, including commercial vehicles weighing less than 10,000 pounds, were eligible for observation. Heavy trucks, buses, and other vehicles weighing over 10,000 pounds were not observed. Only one direction of traffic was observed at any given site. The data collectors were instructed to observe as many lanes of traffic as they could while obtaining data on 99 percent of eligible vehicles. This direction of observation was pre-determined at each location as explained previously. The observations were appropriately weighted, as explained in the Data Analysis Section of this report (Section 5.0).

The observers carried a cover sheet and numerous seat belt observation data collection paper forms to each site. These forms are shown in Appendix I. The observation form was used to record seat belt use by drivers and front-seat passengers, including children in booster seats. The only front-seat occupants excluded from this study were children seated in child seats with harness straps. Table 4 lists the three clearly defined categories of seat belt use that were observed by the data collectors, which included “belted correctly,” “not belted correctly,” and “unknown belt use” as previously described. An occupant was

recorded as “belted correctly” only if they were observed to be properly using the shoulder belt (i.e., shoulder belt was across chest; not under arm or behind back). The “unknown belt use” category was marked if an observer was unable to determine the position of an occupant’s seat belt, and these observations were not included in the final sample, but a record was kept calculating the non-response rate, which is discussed in the Data Analysis Section of this report.

Table 4. Seat Belt Use Codes and Definitions

Code	Definition
Belted	The shoulder belt is in front of the person's shoulder and used correctly.
Not belted	The shoulder belt is not in front of the person's shoulder or not used at all.
Unknown	It cannot reasonably be determined whether the driver or right front passenger is belted.

Additional data collected for each observed front-seat occupant included occupant age (estimated), gender, and race, as well as vehicle type and use (e.g., commercial or non-commercial) information. The driver age categories included 16-29, 30-59, 60 and over, and unknown, while the passenger age also included a 0-15 category. The driver and passenger race categories included white, black, other, or unknown. Each observed vehicle was categorized into one of four groups: passenger cars, sport utility vehicles, vans or minivans, and pickup trucks. The vehicles were also identified as commercial or non-commercial vehicles. Furthermore, each driver was observed for any indication of mobile device use classified as follows: “handheld (talking),” “handheld (typing),” “hands-free (earpiece),” and “hands-free (no earpiece).”

The cover sheet was used to document site information, including date, site location, site number, alternate site data, assigned traffic flow, number of lanes available and observed, start and end times for observations, and weather conditions. This cover sheet was completed by the data collector at each site before any observations took place.

Observations were manually recorded in the field on survey forms and returned back to the office within 24 hours of the data collection or as soon as possible after multiple day trips to outstate locations. The data collected in the field were entered into a spreadsheet by the observer at the conclusion of the data collection activities for each day and verified for accuracy by office staff.

Data collectors also used a handheld tally device to simultaneously count every passenger vehicle that passed through the observed lanes during the 60-minute observation period, regardless of whether a seat belt observation was performed. This volume count was then utilized during the belt use weighting process.

2.6 Rescheduling and Alternate Sites

If a site was temporarily unavailable due to a crash, short-term road work or maintenance, inclement weather, or any event that may hinder exact results, data collection was rescheduled for a similar time of day and type of day of the week. In the event the site was permanently unavailable, such as being closed for long-term construction, then an alternate site selected as part of the reserve sample was to be used as a permanent replacement.

2.7 Sample Size and Precision

A standard error of less than 2.5 percent for the seat belt use estimates is required by the Final Rule. Since 1999, the annual seat belt surveys in Michigan have historically obtained standard errors below this threshold (e.g., 0.4 percent in 2024) with observed sample sizes often exceeding 25,000 vehicles. Since the proposed design for the 2025 Annual Survey was similar to that utilized in 2024, it was expected that the vehicle sample size for the 2025 Annual Survey would be similar to the 2024 Annual Survey and the precision objective was expected to be achieved. In the event that the precision objective was not met, additional observations would be taken, starting with those sites having the fewest observations. New data would be added to existing data until the desired precision was achieved. However, this was determined to not be necessary as the 2025 standard error was well below 2.5 percent.

3.0 OBSERVER TRAINING

The data collection team was comprised of MSU student staff. All data collectors were able to stand for long periods of time, work outdoors, and successfully complete the training program. The data collector training program included both a classroom and field portion. The classroom training program was conducted at MSU several weeks prior to the start of the survey and was led by the PI, Timothy Gates. All data collectors attended this classroom session, which was held in-person. Each data collector received a training manual composed of the information detailed during the training session and all necessary field supplies. The syllabus for the training program is shown as Figure 2.

At the conclusion of the classroom training, the data collectors conducted their first field practice at a location near the MSU campus. QC monitors with experience conducting seat belt surveys were available during this period to respond to questions and offer assistance to data collectors as needed. Reliability and repeatability field data collection practice continued during the weeks leading up to full-scale survey implementation at various intersections near the MSU campus for students living in the East Lansing area and various locations across the state for students living outside of the area. These intersections represented various site characteristics that could be challenging for observational data collection. Initially, inexperienced observers were paired with experienced observers, who noted which individual vehicle the entire group was to evaluate. This allowed an analysis of the accuracy of the inexperienced data collectors in comparison to those who have participated in the study previously. After gaining ample experience,

observers were then assigned to collect seat belt observational data independently. The training data was then entered and compared among the observers in each group to determine the accuracy of their observations.

<u>Day 1 – In-Class Training Program and Field Practice</u>
Welcome, introductions, and distribution of materials
Survey overview
Scheduling and rescheduling
Site Assignment Sheet
Observation periods
Temporary impediments such as weather
Permanent impediments at data collection sites
Site locations
Locating assigned sites
Alternate site selection
Interstate ramps and surface streets
Direction of travel/number of observed lanes
Data collection techniques
Definitions of belt/booster seat use, passenger vehicles
Observation protocol: belt use, vehicle type/use, demographic characteristics
Unobservable vehicles/occupants
Data collection forms
Cover sheet
Recording alternate site information
Recording observations
Data entry procedures
Travel reports, lodging, and auto reservations
Field practice at ramps and surface streets
<u>Days 2-10 Continued Field Practice</u>
Field practice at ramps and surface streets

Figure 2. Training Syllabus

4.0 QUALITY CONTROL

The policies and procedures utilized while conducting the direct observation surveys of seat belt use were based upon the *Uniform Criteria for State Observational Surveys of Seat Belt Use* from Title 23, Part

1240.12 of the Code of Federal Regulations. The study design for the 2025 Annual Survey was consistent with these criteria, which established observations should be conducted on specific dates and times and in particular directions of travel, all of which were determined randomly in advance of the studies. Further, the criteria state policies should be in place in the event observations cannot be made due to unanticipated events, such as road construction. In such situations, data collectors were instructed to observe at the pre-assigned alternate location. Policies were also established for cases where traffic flow is too heavy to observe all vehicles or traffic is moving too quickly for observation. In most instances, high traffic volumes prohibit data collectors from observing all vehicles. Consequently, data collectors were instructed to observe as many vehicles as is feasible for observation under such conditions for the required time period of 60 minutes, although all passenger vehicles traveling through the observed lanes during the data collection period were included in the volume count.

The principal investigators from MSU served as the QC monitors, conducting site audits of the data collectors. The QC monitor made unannounced covert visits to five percent of all data collection sites over the duration of the study, which amounted to 10 sites. The purpose of these visits was to ensure data collectors were following all survey protocol, including performing observational surveys at the assigned location, in the assigned direction, and during the assigned time period; completing the cover sheet and observation forms correctly; and making accurate observations of seat belt use within an appropriate number of lanes. The random checks were conducted at least once for each observer, and no major violations of policies or procedures were observed as a part of these audits. The QC monitors also checked a 10 percent random sample of the entered data to ensure the observation data were being entered correctly from the data collection forms. After data entry, all forms were organized, boxed, and stored for three years.

5.0 DATA ANALYSIS

The data collected in the field as a part of the 35-county Annual Survey for 2025 were entered into a spreadsheet by the observer at the conclusion of the data collection activities for each day and verified for accuracy by office staff. Rates for seat belt and mobile device use were determined for each survey stratum, county, location, etc., as well as the statewide annual average. A 95-percent confidence interval for each use rate estimate was determined according to the NHTSA guidelines. The following sections outline the methods used to estimate the use rate and variance for seat belts. A similar procedure was utilized to estimate mobile device use rate and variance.

5.1 Imputation

No imputation was done on missing data.

5.2 Sampling Weights

The following is a summary of the notation used in this section.

g : Subscript for belt use group strata

h : Subscript for road segment strata

i : Subscript for road segment

j : Subscript for time segment

k : Subscript for road direction

l : Subscript for lane

m : Subscript for vehicle

n : Subscript for front-seat occupant

Under this stratified multistage sample design, the inclusion probability for each observed vehicle was the product of selection probabilities at all stages: π_g for belt use group (stratum-road class), $\pi_{hi|g}$ for road segment, $\pi_{j|ghi}$ for time segment, $\pi_{k|ghij}$ for direction, $\pi_{l|ghijk}$ for lane, and $\pi_{m|ghijkl}$ for vehicle. So the overall vehicle inclusion probability was:

$$\pi_{ghijklm} = \pi_g \pi_{hi|g} \pi_{j|ghi} \pi_{k|ghij} \pi_{l|ghijk} \pi_{m|ghijkl}.$$

The sampling weight (design weight) for vehicle m is:

$$w_{gchijklm} = \frac{1}{\pi_{gchijklm}}$$

5.3 Non-Responding Site Adjustment

There were no sites which required “non-responding” adjustment in the 2024 Annual Survey due to zero eligible vehicles arriving during the observation period.

5.4 Estimators

Noting all front-seat occupants were observed, the driver/passenger seat belt use status was:

$$y_{ghijklmn} = \begin{cases} 1, & \text{if belt used} \\ 0, & \text{otherwise} \end{cases}$$

In order to estimate the weighted seat belt use rate most accurately for the entire state of Michigan, the estimator used in this analysis was weighted by segment length and stratum-level VMT to determine the overall annual belt use rate in Michigan. This estimation technique is detailed in *An Example of a Compliant*

State Seat Belt Use Survey Design [6]. Under this estimator, the use rates within each stratum were first calculated using the road segment length-based estimator:

$$p_{L_{gh}} = \frac{\sum_{all\ i,j,k,l,m,n\ in\ gh} w_{ijklm|gh} Length_{ghi} y_{ghijklmn}}{\sum_{all\ i,j,k,l,m,n\ in\ gh} w_{ijklm|gh} Length_{ghi}}$$

The twelve stratum-specific use rates were then weighted by the proportion of total statewide VMT (shown in Table 5) within each stratum, which resulted in the road class VMT-based estimator:

$$p_{VMT} = \frac{\sum_g w_g \sum_h VMT_{gh} p_{gh}}{\sum_g w_g \sum_h VMT_{gh}}$$

The use of the VMT-based estimator (p_{VMT}) reduced the weighting bias towards local road observation sites by accounting for their relatively short length and low VMT as compared to primary and secondary roads. VMT data were obtained from the Michigan Highway Performance Monitoring System (HPMS) for the year 2023 (most recent available), which are displayed by stratum in Table 5.

Table 5. Annual Vehicle Miles of Travel by Stratum, 2023 (in 1,000s)

Belt Use Stratum	Road Class			Total
	Primary	Secondary	Local	
1	7,193,706	11,217,686	2,323,162	20,734,554
2	8,140,378	11,974,461	2,169,278	22,284,117
3	6,475,349	12,825,817	2,193,399	21,494,564
4	7,299,726	11,223,531	2,496,937	21,020,195
Statewide	29,109,159	47,241,495	9,182,775	85,533,429

5.5 Variance Estimation

The variance (and standard error) for each estimator was determined using the “Delete-1 Jackknife” variance estimation program in SUDAAN 11 software. Under this methodology, the variance was calculated by deleting one observation location and adjusting the weights of the remaining PSUs in the same stratum to account for the deleted PSU. The procedure was repeated, removing each location once. For the road class VMT-based estimator (p_{VMT}), the “Delete-1 Jackknife” method was used to estimate the variances within each of the road class/belt use strata:

$$V(p_{gh}) = \left(\frac{n_{gh} - 1}{n_{gh}} \right) \sum_{i=1}^{n_{gh}} (p_{ghi} - p_{gh})(p_{ghi} - p_{gh})'$$

where:

$V(p_{gh})$ = Estimated variance within each of the road class/belt use strata

p = Estimated belt use rate

p_{ghi} = Estimated belt use rate at location i in road segment type h in belt use group g

p_{gh} = Estimated belt use rate in road segment type h in belt use group g

n_{gh} = Number of locations of road segment type h in belt use group g

The variance for the annual use rate was then determined using the following equation:

$$V(p) = \frac{\sum_{\forall g, \forall h} VMT_{gh}^2 V(p_{gh})}{\left(\sum_{\forall g, \forall h} VMT_{gh}\right)^2}$$

where:

$V(p)$ = Estimated variance of statewide belt use rate

The standard error of the statewide use rate was found by simply taking the square root of the estimated variance. The 95 percent confidence interval of the statewide belt use was equal to the weighted seat belt use rate plus/minus 1.96 (for the Z-test at $\alpha = 0.05$) multiplied by the standard error expressed as a percent.

5.6 Non-Response Rate

According to the NHTSA's guidelines, the non-response rate for the 2025 Annual Survey cannot exceed 10 percent. A non-response occurs when the observer was not able to determine the seat belt use of a front-seat vehicle occupant. This can occur due to a variety of reasons, such as tinted windows, sun glare, high speeds of the vehicle in question, etc. Observers in the field marked either "vehicle not observable" or "unknown belt use" to keep a record of the non-response rate. There were a total of 25 non-response observations in the 2025 Annual Survey, which represents approximately 0.11 percent of the total number of observations. This non-response rate was well below the allowable maximum of 10 percent established by the NHTSA. It should be noted that "non-response" observations are not included in the analyses or tables in Chapter 6.0.

6.0 RESULTS AND TRENDS

The 2025 Annual Survey was performed between Tuesday, May 27 and Monday, June 16, 2025. During this observation period, a total of 19,887 vehicles were observed, resulting in 22,861 total observations of drivers and right-front passengers at the 200 observation sites randomly selected to represent statewide seat belt use according to the federal Uniform Criteria.

6.1 Seat Belt Survey Results

The overall 2025 weighted annual seat belt use rate for Michigan was found to be 93.2 percent and is shown in Table 6, along with the standard error and confidence interval. The overall weighted annual seat belt use rate was calculated based upon the procedure described in the Data Analysis Section (Section 5.0) of this report. The overall annual seat belt use rate is representative of all front-seat occupants (drivers and right-front passengers), all daytime hours (7 a.m.–7 p.m.), and all days of the week. Again, it is noted that “belted” occupants included all drivers and front-seat passengers who were belted correctly, while “not belted” occupants included drivers and front-seat passengers who were either not belted or were wearing the shoulder belt incorrectly (e.g., under their arm or behind their back). The results of the belt use surveys at each of the 200 observation locations are provided in Appendix III.

Table 6. Weighted Seat Belt Use Rate for Drivers and Front-Seat Passengers

Observational Wave	Seat Belt Use Rate*	Standard Error
Annual	93.2 ± 0.8%	0.4%

* Weighted Seat Belt Usage ± 95% Confidence Band

The seat belt use rate has also been calculated by occupant type, stratum, county, vehicle type, and various demographic categories, as presented in Table 7 and Tables 9 through 15. It should be noted that the seat belt use rates presented in these subsequent tables represent the raw (i.e., unweighted) seat belt use. As these raw rates are not weighted, they will vary slightly from the weighted annual use rate presented in Table 6.

Table 7 displays the raw (unweighted) seat belt use rates separately for drivers and right-front passengers. Table 8 summarizes the descriptive statistics for the seat belt survey in terms of sampling statistics for day of week and time of day.

Table 7. Seat Belt Use by Occupant Type

Belt Use	Total Occupant Count	Belted Occupant Count	% Seat Belt Use*
Drivers	19,887	18,529	93.2%
Passengers (Right-Front)	2,974	2,807	94.4%
Total	22,861	21,336	93.3%

*Unweighted rate based on the raw observation data.

Table 8. Sampling Summary by Day of Week and Time of Day

Day of Week	Number of Sites Observed	Percent of Sites Observed	Number of Occupants Observed	Percent of Occupants Observed
Sunday	22	11.0%	2,665	11.7%
Monday	32	16.0%	3,079	13.5%
Tuesday	19	9.5%	1,987	8.7%
Wednesday	28	14.0%	3,360	14.7%
Thursday	46	23.0%	5,362	23.5%
Friday	25	12.5%	3,081	13.5%
Saturday	28	14.0%	3,327	14.6%
Total	200	100%	22,861	100%
Time of Day	Number of Sites Observed	Percent of Sites Observed	Number of Occupants Observed	Percent of Occupants Observed
7 a.m.–8 a.m.	10	5.0%	943	4.1%
8 a.m.–9 a.m.	13	6.5%	1,392	6.1%
9 a.m.–10 a.m.	16	8.0%	1,964	8.6%
10 a.m.–11 a.m.	25	12.5%	2,898	12.7%
11 a.m.–12 p.m.	18	9.0%	2,301	10.1%
12 p.m.–1 p.m.	22	11.0%	2,296	10.0%
1 p.m.–2 p.m.	24	12.0%	2,963	13.0%
2 p.m.–3 p.m.	19	9.5%	2,214	9.7%
3 p.m.–4 p.m.	23	11.5%	2,640	11.5%
4 p.m.–5 p.m.	10	5.0%	1,147	5.0%
5 p.m.–6 p.m.	10	5.0%	1,018	4.5%
6 p.m.–7 p.m.	10	5.0%	1,085	4.7%
Total	200	100%	22,861	100%

Table 9 summarizes the 2025 driver and front-seat passenger seat belt use rates by county and belt-use stratum. Because of the relatively low number of sites and/or observations in many counties, the seat belt use rates listed may not be fully representative of each county. Stratum 1 displayed the highest seat belt use rate of 94.7 percent, while Stratum 4 displayed the lowest seat belt use rate at 90.6 percent. Tables 10 through 14 summarize occupant seat belt use for drivers and front-seat passengers by vehicle type for each day of the week, time of the day, gender, age, and race.

Table 9. Seat Belt Use by Stratum and County

STRATUM 1	Total Occupant Count	Belted Occupant Count	% Seat Belt Use*
Ingham County	1,236	1,161	93.9%
Kalamazoo County	1,471	1,401	95.2%
Oakland County	1,806	1,696	93.9%
Washtenaw County	1,509	1,447	95.9%
Total	6,022	5,705	94.7%
STRATUM 2	Total Occupant Count	Belted Occupant Count	% Seat Belt Use*
Allegan County	662	648	97.9%
Bay County	529	503	95.1%
Calhoun County	878	808	92.0%
Eaton County	120	113	94.2%
Grand Traverse County	550	507	92.2%
Jackson County	304	291	95.7%
Kent County	1,004	932	92.8%
Livingston County	135	129	95.6%
Midland County	264	244	92.4%
Monroe County	334	318	95.2%
Ottawa County	834	790	94.7%
Total	5,614	5,283	94.1%
STRATUM 3	Total Occupant Count	Belted Occupant Count	% Seat Belt Use*
Barry County	218	204	93.6%
Berrien County	217	197	90.8%
Cass County	122	110	90.2%
Clare County	446	394	88.3%
Clinton County	249	234	94.0%
Genesee County	322	311	96.6%
Isabella County	376	365	97.1%
Lapeer County	382	366	95.8%
Lenawee County	242	221	91.3%
Montcalm County	367	340	92.6%
Muskegon County	229	219	95.6%
Newaygo County	160	155	96.9%
Saginaw County	378	357	94.4%
Shiawassee County	154	148	96.1%
St. Clair County	441	399	90.5%
St. Joseph County	61	55	90.2%
Tuscola County	690	662	95.9%
Van Buren County	443	424	95.7%
Total	5,497	5,161	93.9%
STRATUM 4	Total Occupant Count	Belted Occupant Count	% Seat Belt Use*
Macomb County	1,741	1,587	91.2%
Wayne County	3,987	3,600	90.3%
Total	5,728	5,187	90.6%
Grand Total	22,861	21,336	93.3%

*Unweighted rate based on the raw observation data.

Table 10. Seat Belt Use by Day of Week, Time of Day, Vehicle Type, and Demographics

Day of Week	Total Occupant Count	Belted Occupant Count	% Seat Belt Use*
Sunday	2,665	2,494	93.6%
Monday	3,079	2,855	92.7%
Tuesday	1,987	1,870	94.1%
Wednesday	3,360	3,097	92.2%
Thursday	5,362	5,063	94.4%
Friday	3,081	2,865	93.0%
Saturday	3,327	3,092	92.9%
Total	22,861	21,336	93.3%
Time of Day	Total Occupant Count	Belted Occupant Count	% Seat Belt Use*
7 a.m.–8 a.m.	943	872	92.5%
8 a.m.–9 a.m.	1,392	1,294	93.0%
9 a.m.–10 a.m.	1,964	1,815	92.4%
10 a.m.–11 a.m.	2,898	2,704	93.3%
11 a.m.–12 p.m.	2,301	2,119	92.1%
12 p.m.–1 p.m.	2,296	2,139	93.2%
1 p.m.–2 p.m.	2,963	2,772	93.6%
2 p.m.–3 p.m.	2,214	2,052	92.7%
3 p.m.–4 p.m.	2,640	2,486	94.2%
4 p.m.–5 p.m.	1,147	1,087	94.8%
5 p.m.–6 p.m.	1,018	964	94.7%
6 p.m.–7 p.m.	1,085	1,032	95.1%
Total	22,861	21,336	93.3%
Vehicle Type	Total Occupant Count	Belted Occupant Count	% Seat Belt Use*
Passenger Cars	5,142	4,723	91.9%
Sport Utility Vehicles	11,611	11,090	95.5%
Vans/Minivans	1,716	1,602	93.4%
Pickup Trucks	4,392	3,921	89.3%
Total	22,861	21,336	93.3%
Gender	Total Occupant Count	Belted Occupant Count	% Seat Belt Use*
Male	12,608	11,565	91.7%
Female	10,240	9,758	95.3%
Unknown	13	13	100.0%
Total	22,861	21,336	93.3%
Age	Total Occupant Count	Belted Occupant Count	% Seat Belt Use*
0-15	123	117	95.1%
16-29	3,667	3,414	93.1%
30-59	14,509	13,483	92.9%
60+	4,559	4,319	94.7%
Unknown	3	3	100.0%
Total	22,861	21,336	93.3%
Race	Total Occupant Count	Belted Occupant Count	% Seat Belt Use*
White	19,334	18,188	94.1%
Black	2,384	2,092	87.8%
Other	1,127	1,040	92.3%
Unknown	16	16	100.0%
Total	22,861	21,336	93.3%

*Unweighted rate based on the raw observation data.

Table 11. Seat Belt Use: Passenger Cars

Seat Belt Use in Passenger Cars			
Day of Week	Total Occupant Count	Belted Occupant Count	% Seat Belt Use*
Sunday	549	504	91.8%
Monday	773	715	92.5%
Tuesday	457	422	92.3%
Wednesday	695	627	90.2%
Thursday	1,225	1,137	92.8%
Friday	746	683	91.6%
Saturday	697	635	91.1%
Total	5,142	4,723	91.9%
Time of Day	Total Occupant Count	Belted Occupant Count	% Seat Belt Use*
7 a.m.–8 a.m.	234	213	91.0%
8 a.m.–9 a.m.	327	293	89.6%
9 a.m.–10 a.m.	442	405	91.6%
10 a.m.–11 a.m.	666	609	91.4%
11 a.m.–12 p.m.	482	440	91.3%
12 p.m.–1 p.m.	540	500	92.6%
1 p.m.–2 p.m.	598	546	91.3%
2 p.m.–3 p.m.	503	459	91.3%
3 p.m.–4 p.m.	606	565	93.2%
4 p.m.–5 p.m.	238	219	92.0%
5 p.m.–6 p.m.	232	215	92.7%
6 p.m.–7 p.m.	274	259	94.5%
Total	5,142	4,723	91.9%
Gender	Total Occupant Count	Belted Occupant Count	% Seat Belt Use*
Male	2,996	2,715	90.6%
Female	2,140	2,002	93.6%
Unknown	6	6	100.0%
Total	5,142	4,723	91.9%
Age	Total Occupant Count	Belted Occupant Count	% Seat Belt Use*
0-15	25	24	96.0%
16-29	1,245	1,139	91.5%
30-59	2,991	2,733	91.4%
60+	880	826	93.9%
Unknown	1	1	100.0%
Total	5,142	4,723	91.9%
Race	Total Occupant Count	Belted Occupant Count	% Seat Belt Use*
White	4,039	3,755	93.0%
Black	782	674	86.2%
Other	316	289	91.5%
Unknown	5	5	100.0%
Total	5,142	4,723	91.9%

*Unweighted rate based on the raw observation data.

Table 12. Seat Belt Use: Sport Utility Vehicles

Seat Belt Use in Sport Utility Vehicles			
Day of Week	Total Occupant Count	Belted Occupant Count	% Seat Belt Use*
Sunday	1,448	1,381	95.4%
Monday	1,503	1,424	94.7%
Tuesday	1,026	988	96.3%
Wednesday	1,699	1,607	94.6%
Thursday	2,731	2,631	96.3%
Friday	1,445	1,386	95.9%
Saturday	1,759	1,673	95.1%
Total	11,611	11,090	95.5%
Time of Day	Total Occupant Count	Belted Occupant Count	% Seat Belt Use*
7 a.m.–8 a.m.	440	419	95.2%
8 a.m.–9 a.m.	710	679	95.6%
9 a.m.–10 a.m.	985	931	94.5%
10 a.m.–11 a.m.	1,431	1,368	95.6%
11 a.m.–12 p.m.	1,160	1,098	94.7%
12 p.m.–1 p.m.	1,187	1,136	95.7%
1 p.m.–2 p.m.	1,575	1,508	95.7%
2 p.m.–3 p.m.	1,182	1,117	94.5%
3 p.m.–4 p.m.	1,319	1,265	95.9%
4 p.m.–5 p.m.	594	578	97.3%
5 p.m.–6 p.m.	509	488	95.9%
6 p.m.–7 p.m.	519	503	96.9%
Total	11,611	11,090	95.5%
Gender	Total Occupant Count	Belted Occupant Count	% Seat Belt Use*
Male	5,016	4,756	94.8%
Female	6,591	6,330	96.0%
Unknown	4	4	100.0%
Total	11,611	11,090	95.5%
Age	Total Occupant Count	Belted Occupant Count	% Seat Belt Use*
0-15	61	58	95.1%
16-29	1,789	1,713	95.8%
30-59	7,289	6,932	95.1%
60+	2,470	2,385	96.6%
Unknown	2	2	100.0%
Total	11,611	11,090	95.5%
Race	Total Occupant Count	Belted Occupant Count	% Seat Belt Use*
White	9,831	9,466	96.3%
Black	1,174	1,053	89.7%
Other	597	562	94.1%
Unknown	9	9	100.0%
Total	11,611	11,090	95.5%

*Unweighted rate based on the raw observation data.

Table 13. Seat Belt Use: Vans and Minivans

Seat Belt Use in Vans and Minivans			
Day of Week	Total Occupant Count	Belted Occupant Count	% Seat Belt Use*
Sunday	180	168	93.3%
Monday	229	206	90.0%
Tuesday	144	132	91.7%
Wednesday	259	239	92.3%
Thursday	421	399	94.8%
Friday	245	230	93.9%
Saturday	238	228	95.8%
Total	1,716	1,602	93.4%
Time of Day	Total Occupant Count	Belted Occupant Count	% Seat Belt Use*
7 a.m.–8 a.m.	61	55	90.2%
8 a.m.–9 a.m.	106	96	90.6%
9 a.m.–10 a.m.	160	150	93.8%
10 a.m.–11 a.m.	259	247	95.4%
11 a.m.–12 p.m.	187	170	90.9%
12 p.m.–1 p.m.	170	155	91.2%
1 p.m.–2 p.m.	208	196	94.2%
2 p.m.–3 p.m.	168	156	92.9%
3 p.m.–4 p.m.	167	157	94.0%
4 p.m.–5 p.m.	83	78	94.0%
5 p.m.–6 p.m.	69	66	95.7%
6 p.m.–7 p.m.	78	76	97.4%
Total	1,716	1,602	93.4%
Gender	Total Occupant Count	Belted Occupant Count	% Seat Belt Use*
Male	1,046	958	91.6%
Female	670	644	96.1%
Unknown	0	0	Not applicable
Total	1,716	1,602	93.4%
Age	Total Occupant Count	Belted Occupant Count	% Seat Belt Use*
0-15	12	11	91.7%
16-29	180	168	93.3%
30-59	1,221	1,137	93.1%
60+	303	286	94.4%
Unknown	0	0	Not applicable
Total	1,716	1,602	93.4%
Race	Total Occupant Count	Belted Occupant Count	% Seat Belt Use*
White	1,435	1,359	94.7%
Black	198	167	84.3%
Other	82	75	91.5%
Unknown	1	1	100.0%
Total	1,716	1,602	93.4%

*Unweighted rate based on the raw observation data.

Table 14. Seat Belt Use: Pickup Trucks

Seat Belt Use in Pickup Trucks			
Day of Week	Total Occupant Count	Belted Occupant Count	% Seat Belt Use*
Sunday	488	441	90.4%
Monday	574	510	88.9%
Tuesday	360	328	91.1%
Wednesday	707	624	88.3%
Thursday	985	896	91.0%
Friday	645	566	87.8%
Saturday	633	556	87.8%
Total	4,392	3,921	89.3%
Time of the Day	Total Occupant Count	Belted Occupant Count	% Seat Belt Use*
7 a.m.–8 a.m.	208	185	88.9%
8 a.m.–9 a.m.	249	226	90.8%
9 a.m.–10 a.m.	377	329	87.3%
10 a.m.–11 a.m.	542	480	88.6%
11 a.m.–12 p.m.	472	411	87.1%
12 p.m.–1 p.m.	399	348	87.2%
1 p.m.–2 p.m.	582	522	89.7%
2 p.m.–3 p.m.	361	320	88.6%
3 p.m.–4 p.m.	548	499	91.1%
4 p.m.–5 p.m.	232	212	91.4%
5 p.m.–6 p.m.	208	195	93.8%
6 p.m.–7 p.m.	214	194	90.7%
Total	4,392	3,921	89.3%
Gender	Total Occupant Count	Belted Occupant Count	% Seat Belt Use*
Male	3,550	3,136	88.3%
Female	839	782	93.2%
Unknown	3	3	100.0%
Total	4,392	3,921	89.3%
Age	Total Occupant Count	Belted Occupant Count	% Seat Belt Use*
0-15	25	24	96.0%
16-29	453	394	87.0%
30-59	3,008	2,681	89.1%
60+	906	822	90.7%
Unknown	0	0	Not applicable
Total	4,392	3,921	89.3%
Race	Total Occupant Count	Belted Occupant Count	% Seat Belt Use*
White	4,029	3,608	89.6%
Black	230	198	86.1%
Other	132	114	86.4%
Unknown	1	1	100.0%
Total	4,392	3,921	89.3%

*Unweighted rate based on the raw observation data.

Occupants of SUVs exhibited the highest seat belt use rate among vehicle types at 95.5 percent, followed by occupants of vans and minivans at 93.4 percent. Occupants of passenger cars exhibited a use rate of 91.9 percent, while occupants of pickup trucks exhibited the lowest use rate at 89.3 percent, which is consistent with historical trends. Considering days of the week, Wednesdays demonstrated the lowest seat belt usage rate with 92.2 percent. Seat belt use rates were highest on Thursdays with a rate of 94.4 percent. The time period 11 a.m.–12 p.m. exhibited a lower usage rate (92.1 percent) than during all other times of the day, while the highest belt use rate (95.1 percent) was observed between 6 p.m. and 7 p.m.

Female occupants had higher use rates than male occupants by 3.6 percentage points (95.3 percent use rate for women vs. 91.7 percent use rate for men). The seat belt usage rate was highest among occupants aged 0 to 15 (95.1 percent) and lowest for occupants between the ages of 30 to 59 (92.9 percent). Considering occupant race, the seat belt use rate was found to be lowest among black occupants (87.8 percent), while white occupants and other races were found to have a seat belt use rate of 94.1 percent and 92.3 percent, respectively.

Table 15 summarizes occupant seat belt use rates by gender, age, and race. Vehicle occupants whose gender could not be identified were excluded from this demographic comparison. Black men aged 16 to 29 exhibited the lowest belt use rate (81.4 percent) among all demographic categories with at least 10 observations, which is consistent with prior belt use surveys. Also similar to previous findings, white women generally exhibited the highest seat belt use rates across the various age groups compared to other demographics, particularly those aged 60 and over (96.4 percent).

Table 15. Seat Belt Use by Gender, Age, and Race

Gender	Age	Race	Total Occupant Count	Belted Occupant Count	% Seat Belt Use*
Male	0-15	White	59	58	98.3%
		Black	3	2	66.7%
		Other	2	2	100.0%
		Unknown	0	0	Not applicable
		Total	64	62	96.9%
	16-29	White	1,249	1,139	91.2%
		Black	156	127	81.4%
		Other	84	82	97.6%
		Unknown	1	1	100.0%
		Total	1,490	1,349	90.5%
	30-59	White	6,894	6,363	92.3%
		Black	1,096	939	85.7%
		Other	543	491	90.4%
		Unknown	4	4	100.0%
		Total	8,537	7,797	91.3%
	60+	White	2,388	2,238	93.7%
		Black	79	71	89.9%
		Other	42	40	95.2%
		Unknown	5	5	100.0%
		Total	2,514	2,354	93.6%
	Unknown	White	3	3	100.0%
		Black	0	0	Not applicable
		Other	0	0	Not applicable
		Unknown	0	0	Not applicable
		Total	3	3	100.0%
	TOTAL MALES		12,608	11,565	91.7%
Female	0-15	White	51	47	92.2%
		Black	5	5	100.0%
		Other	2	2	100.0%
		Unknown	0	0	Not applicable
		Total	58	54	93.1%
	16-29	White	1,898	1,818	95.8%
		Black	183	160	87.4%
		Other	92	83	90.2%
		Unknown	1	1	100.0%
		Total	2,174	2,062	94.8%
	30-59	White	4,848	4,647	95.9%
		Black	799	731	91.5%
		Other	322	305	94.7%
		Unknown	3	3	100.0%
		Total	5,972	5,686	95.2%
	60+	White	1,934	1,865	96.4%
		Black	61	55	90.2%
		Other	40	35	87.5%
		Unknown	1	1	100.0%
		Total	2,036	1,956	96.1%
	Unknown	White	0	0	Not applicable
		Black	0	0	Not applicable
		Other	0	0	Not applicable
		Unknown	0	0	Not applicable
		Total	0	0	Not applicable
	TOTAL FEMALES		10,240	9,758	95.3%

*Unweighted rate based on the raw observation data.

6.2 Seat Belt Use Trends

Figure 3 displays the seat belt use trends from the Michigan annual seat belt surveys between 2014 and 2025 during which seat belt use ranged between 92.0 (2024) and 94.5 (2016). In comparison to 2024, the 2025 Annual Survey revealed an increase in seat belt usage from 92.0 percent in 2024 to 93.2 percent in 2025. From a geographic standpoint, this increase in the statewide use rate is largely driven by increases in belt use within several counties in Stratum 3, which are generally rural counties, coupled with slight increases in Stratum 1 counties, particularly Kalamazoo County. Additionally, Wayne County, which accounted for the greatest number of observations within any single county, and greater than 17 percent of all observations, saw belt use rates increase from 88.9 percent in 2024 to 90.3 percent in 2025. Furthermore, as shown in this and previous annual surveys of seat belt use in Michigan, from a demographic standpoint, the lowest seat belt use rates were observed for young men, black men, and males in pickup trucks. Continued public awareness and enforcement efforts addressing at-risk vehicle occupants and geographic areas prone to low belt use rates are warranted to increase seat belt use.

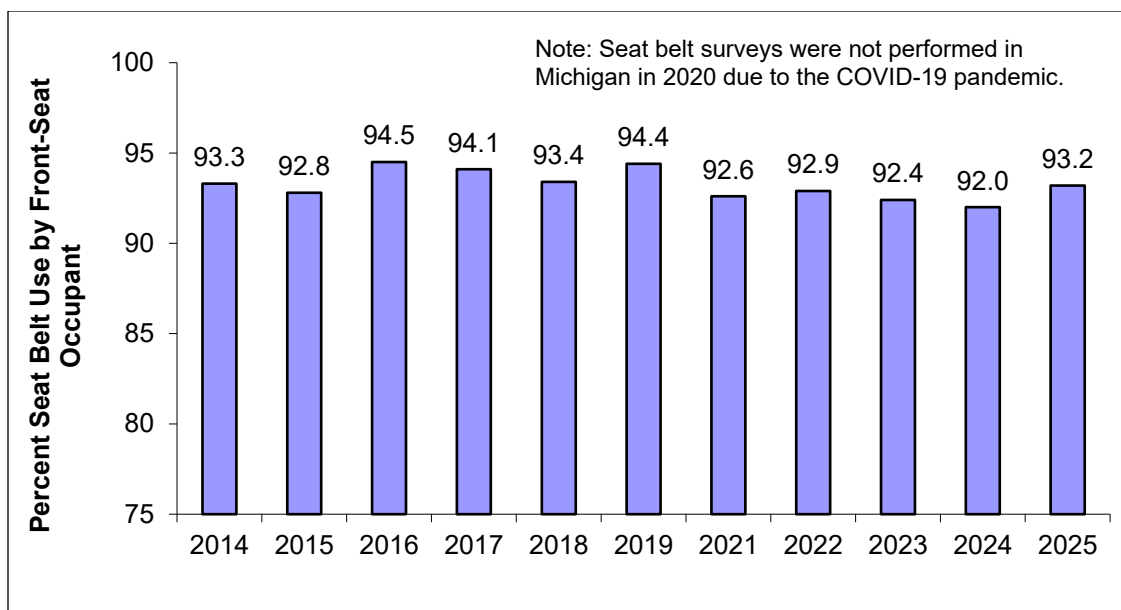


Figure 3. Seat Belt Use by Front-Seat Occupants in Michigan, 2014-2025

6.3 Mobile Device Survey Results

Mobile device use among drivers was also collected as a part of the 2025 Annual Survey. Drivers who were observed utilizing a mobile device were categorized as follows:

- Talking: Handheld
- Typing: Handheld
- Talking: Hands-free (Earpiece Observed)
- Talking: Hands-free (Earpiece Not Observed)

Table 16 presents driver mobile device use in 2025 by the type of use.

Table 16. Driver Mobile Device Use Rates by Type of Use

Type of Use	Total Number of Driver Observations	Number of Drivers Using a Mobile Device	% Mobile Device Use by Drivers*
Talking: Handheld	19,887	439	2.2%
Typing: Handheld	19,887	621	3.1%
Talking: Hands-Free (Earpiece Observed)	19,887	68	0.3%
Talking: Hands-Free (Earpiece Not Observed)	19,887	235	1.2%
Overall Mobile Device Use	19,887	1,363	6.9%

*Unweighted rate based on the raw observation data.

In prior years, Michigan's overall mobile device use calculation included all four of the above categories. However, due to the introduction of Michigan's distracted-driving law, which went into effect on June 30, 2023, thereby prohibiting drivers from manually using a cell phone or other mobile device while operating a vehicle, a handheld-only mobile device use rate was also calculated in addition to the overall (i.e., handheld plus hands-free) rate.

6.3.1 All Mobile Device Use (Handheld and Hands-Free)

When all handheld and hands-free mobile device use categories were included, the overall weighted driver mobile device use rate for Michigan in 2025 was 7.2 percent, which is shown in Table 17, along with the confidence band and standard error. The weighting procedure was the same as that for the seat belt rate described in the Data Analysis Section (Section 5.0) of the report, and, therefore, the weighted rate will differ from the raw/unweighted values presented in subsequent tables.

Table 17. Weighted Driver Mobile Device Use Rate (Handheld and Hands-Free)

Type of Use	Use Rate*	Standard Error
All Uses of Mobile Devices (Handheld and Hands-Free)	7.2 ± 0.8%	0.4%

* Weighted Driver Mobile Device Usage ± 95% Confidence Band

Table 18 summarizes the use of mobile devices (handheld and hands-free) by drivers in terms of stratum, day of the week, time of the day, vehicle type, gender, age, and race. Considering the four strata, the highest mobile device use by drivers was observed in Stratum 4 (8.0 percent). Women were found to be more likely to use a mobile device while driving than men (7.5 percent and 6.4 percent, respectively). The mobile device use rate was found to be highest between 11 a.m. and 12 p.m. (9.5 percent), while the mobile device use rate was lowest between 5 p.m. and 6 p.m. (2.7 percent). Perhaps most notably, there is a clear

decreasing trend between age and mobile device use. Mobile device use was highest (9.0 percent) for drivers under 30 years of age, compared to 7.6 percent for drivers aged 30 to 59 and 2.4 percent for drivers aged 60 and above. Black drivers tended to exhibit higher mobile device use rates (11.9 percent) compared to the other race categories. Turning to days of the week, mobile device use was highest on Wednesdays (9.0 percent) and lowest on Sundays (5.1 percent). Finally, mobile device use was highest among drivers of sport utility vehicles (7.4 percent) and lowest among drivers of passenger cars (6.0 percent).

Table 18. Driver Mobile Device Use by Stratum, Day of Week, Time of Day, Vehicle Type, and Demographics (Handheld and Hands-Free)

Stratum	Total Number of Driver Observations	Number of Drivers Using a Mobile Device	Percent of Drivers Using a Mobile Device*
1	5,403	425	7.9%
2	4,805	276	5.7%
3	4,579	253	5.5%
4	5,100	409	8.0%
Total	19,887	1,363	6.9%
Day of Week	Total Number of Driver Observations	Number of Drivers Using a Mobile Device	Percent of Drivers Using a Mobile Device*
Sunday	2,217	113	5.1%
Monday	2,807	170	6.1%
Tuesday	1,799	119	6.6%
Wednesday	2,961	266	9.0%
Thursday	4,762	353	7.4%
Friday	2,624	193	7.4%
Saturday	2,717	149	5.5%
Total	19,887	1,363	6.9%
Time of Day	Total Number of Driver Observations	Number of Drivers Using a Mobile Device	Percent of Drivers Using a Mobile Device*
7 a.m.–8 a.m.	865	69	8.0%
8 a.m.–9 a.m.	1,222	106	8.7%
9 a.m.–10 a.m.	1,719	137	8.0%
10 a.m.–11 a.m.	2,504	154	6.2%
11 a.m.–12 p.m.	1,967	187	9.5%
12 p.m.–1 p.m.	2,019	149	7.4%
1 p.m.–2 p.m.	2,544	180	7.1%
2 p.m.–3 p.m.	1,880	116	6.2%
3 p.m.–4 p.m.	2,352	135	5.7%
4 p.m.–5 p.m.	1,000	66	6.6%
5 p.m.–6 p.m.	888	24	2.7%
6 p.m.–7 p.m.	927	40	4.3%
Total	19,887	1,363	6.9%

*Unweighted rate based on the raw observation data.

Table 18. Driver Mobile Device Use by Stratum, Day of Week, Time of Day, Vehicle Type, and Demographics (Handheld and Hands-Free) (Continued)

Vehicle Type	Total Number of Driver Observations	Number of Drivers Using a Mobile Device	Percent of Drivers Using a Mobile Device*
Passenger Cars	4,612	276	6.0%
Sport Utility Vehicles	9,970	737	7.4%
Vans/Minivans	1,445	97	6.7%
Pickup Trucks	3,860	253	6.6%
Total	19,887	1,363	6.9%
Gender	Total Number of Driver Observations	Number of Drivers Using a Mobile Device	Percent of Drivers Using a Mobile Device*
Male	11,622	742	6.4%
Female	8,255	621	7.5%
Unknown	10	0	0.0%
Total	19,887	1,363	6.9%
Age	Total Number of Driver Observations	Number of Drivers Using a Mobile Device	Percent of Drivers Using a Mobile Device*
16-29	3,081	278	9.0%
30-59	13,043	993	7.6%
60+	3,760	92	2.4%
Unknown	3	0	0.0%
Total	19,887	1,363	6.9%
Race	Total Number of Driver Observations	Number of Drivers Using a Mobile Device	Percent of Drivers Using a Mobile Device*
White	16,716	1,017	6.1%
Black	2,175	259	11.9%
Other	981	86	8.8%
Unknown	15	1	6.7%
Total	19,887	1,363	6.9%

*Unweighted rate based on the raw observation data.

6.3.2 Handheld Mobile Device Use

Considering only handheld uses of a mobile device (i.e., talking or typing), the overall weighted driver handheld device use rate for Michigan in 2025 was 5.7 percent, which is shown in Table 19, along with the confidence band and standard error. The weighting procedure was the same as that for the seat belt rate described in the Data Analysis Section (Section 5.0) of the report, and, therefore, the weighted rate will differ from the raw/unweighted values presented in subsequent tables.

Table 19. Weighted Driver Handheld Mobile Device Use Rate

Type of Use	Use Rate*	Standard Error
Handheld Uses of Mobile Devices	5.7 ± 0.6%	0.3%

* Weighted Driver Handheld Mobile Device Usage ± 95% Confidence Band

Table 20 summarizes handheld mobile device use for drivers in terms of stratum, day of the week, time of the day, vehicle type, gender, age, and race. Again, by far the highest rate of handheld device use by drivers was observed in Stratum 4 (6.8 percent). Men were found to be slightly more likely to use a handheld device while driving than women (5.4 percent and 5.3 percent, respectively). The handheld device use rate was found to be highest between 11 a.m. and 12 p.m. (7.4 percent), while the use rate was lowest between 5 p.m. and 6 p.m. (2.4 percent). Handheld device use was highest (7.1 percent) for drivers under 30 years of age, compared to 6.0 percent for drivers aged 30 to 59 and 1.7 percent for drivers aged 60 and above. Black drivers exhibited higher handheld device use rates (10.3 percent) compared to other racial categories. Turning to days of the week, handheld device use was highest on Wednesdays (6.2 percent) and lowest on Sundays (4.0 percent). Finally, handheld device use was highest among drivers of pickup trucks and sport utility vehicles (both 5.5 percent) and lowest among drivers of passenger cars (4.9 percent).

Table 20. Driver Handheld Mobile Device Use by Stratum, Day of Week, Time of Day, Vehicle Type, and Demographics

Stratum	Total Number of Driver Observations	Number of Drivers Using a Handheld Mobile Device	Percent of Drivers Using a Handheld Mobile Device*
1	5,403	290	5.4%
2	4,805	220	4.6%
3	4,579	205	4.5%
4	5,100	345	6.8%
Total	19,887	1,060	5.3%
Day of Week	Total Number of Driver Observations	Number of Drivers Using a Handheld Mobile Device	Percent of Drivers Using a Handheld Mobile Device*
Sunday	2,217	89	4.0%
Monday	2,807	145	5.2%
Tuesday	1,799	94	5.2%
Wednesday	2,961	184	6.2%
Thursday	4,762	275	5.8%
Friday	2,624	154	5.9%
Saturday	2,717	119	4.4%
Total	19,887	1,060	5.3%

*Unweighted rate based on the raw observation data.

Table 20. Driver Handheld Mobile Device Use by Stratum, Day of Week, Time of Day, Vehicle Type, and Demographics (Continued)

Time of Day	Total Number of Driver Observations	Number of Drivers Using a Handheld Mobile Device	Percent of Drivers Using a Handheld Mobile Device*
7 a.m.–8 a.m.	865	47	5.4%
8 a.m.–9 a.m.	1,222	85	7.0%
9 a.m.–10 a.m.	1,719	97	5.6%
10 a.m.–11 a.m.	2,504	121	4.8%
11 a.m.–12 p.m.	1,967	145	7.4%
12 p.m.–1 p.m.	2,019	102	5.1%
1 p.m.–2 p.m.	2,544	135	5.3%
2 p.m.–3 p.m.	1,880	100	5.3%
3 p.m.–4 p.m.	2,352	117	5.0%
4 p.m.–5 p.m.	1,000	54	5.4%
5 p.m.–6 p.m.	888	21	2.4%
6 p.m.–7 p.m.	927	36	3.9%
Total	19,887	1,060	5.3%
Vehicle Type	Total Number of Driver Observations	Number of Drivers Using a Handheld Mobile Device	Percent of Drivers Using a Handheld Mobile Device*
Passenger Cars	4,612	225	4.9%
Sport Utility Vehicles	9,970	546	5.5%
Vans/Minivans	1,445	76	5.3%
Pickup Trucks	3,860	213	5.5%
Total	19,887	1,060	5.3%
Gender	Total Number of Driver Observations	Number of Drivers Using a Handheld Mobile Device	Percent of Drivers Using a Handheld Mobile Device*
Male	11,622	622	5.4%
Female	8,255	438	5.3%
Unknown	10	0	0.0%
Total	19,887	1,060	5.3%
Age	Total Number of Driver Observations	Number of Drivers Using a Handheld Mobile Device	Percent of Drivers Using a Handheld Mobile Device*
16-29	3,081	219	7.1%
30-59	13,043	778	6.0%
60+	3,760	63	1.7%
Unknown	3	0	0.0%
Total	19,887	1,060	5.3%
Race	Total Number of Driver Observations	Number of Drivers Using a Handheld Mobile Device	Percent of Drivers Using a Handheld Mobile Device*
White	16,716	770	4.6%
Black	2,175	223	10.3%
Other	981	66	6.7%
Unknown	15	1	6.7%
Total	19,887	1,060	5.3%

*Unweighted rate based on the raw observation data.

6.4 Mobile Device Use Trends

In comparison to the 2023 mobile device surveys, which were performed prior to the new distracted-driving law going into effect, the 2025 surveys revealed decreases both in the use of all mobile devices (handheld and hands-free) and handheld-only mobile devices by Michigan drivers. Considering all mobile devices, the 2025 weighted use rate of 7.2 percent represents a considerable decrease from the 8.3 percent rate observed in 2023 and a slight decrease from the 7.5 percent rate observed in 2024. Nationally, the overall mobile device use rate by drivers was found to be 5.6 percent in 2023 (the most recent national data available), which included handheld talking, hands-free talking (earpiece observed), and typing, although hands-free devices with no earpiece observed were not included [7]. For comparison purposes, the exclusion from the Michigan data of cases where no earpiece was observed drops the 2025 raw/unweighted mobile device use rate to 5.7 percent, which is just marginally higher than the 2023 national rate (5.6 percent).

Considering only handheld uses of mobile devices (e.g., talking, typing), the 2025 weighted use rate of 5.7 percent represents a slight increase from the 5.5 percent use rate observed in 2024 but remains considerably lower than the 6.7 percent use rate observed in 2023. All strata saw consistent handheld device use between 2024 and 2025, except for Stratum 1, where handheld device use increased by 1.1 percentage points. Nevertheless, all strata had lower handheld device use in 2025 compared to 2023 prior to the enactment of the hands-free law. Handheld use of mobile devices remains considerably higher than average in Stratum 4 (Macomb and Wayne Counties), by drivers under the age of 30, and by black drivers. Thus, public awareness campaigns to promote the new distracted-driving law should target geographic areas (e.g., Macomb and Wayne Counties) and demographic groups (e.g., younger drivers and black drivers) exhibiting the highest handheld device use. Compared to the nationwide rate of handheld device use by drivers, Michigan's 2025 weighted handheld device use rate of 5.7 percent is marginally higher than (though not statistically significantly different from) the nationwide rate of 5.1 percent from 2023, which is the most recent year for which national data are available [7].

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APPENDIX I
Michigan Seat Belt Survey Cover Sheet and Data Collection Form

DIRECT OBSERVATION SURVEY COVER SHEET

Date: _____ - _____ - 2025 Observer's Name: _____

Site Identification:

Site Location: _____

Site Number: _____

County: _____ Stratum _____

Alternate Site Information:

Is this an alternate site? No Yes
(Circle one)

If yes, please provide a reason for using an alternate site from the reserve list:

Site Description:

Observation direction: Northbound Southbound Eastbound Westbound

Number of THROUGH lanes observed for seat belt use: _____

Number of RIGHT TURN lanes observed for seat belt use: _____

Number of LEFT TURN lanes observed for seat belt use: _____

Total number of lanes in this travel direction PRIOR TO THE INTERSECTION: _____

Weather Conditions: Clear Light Fog Light Rain

Site Start and End Time:

Start time: _____ End time: _____

Sample Size

60 Minute Volume Count (for lanes being observed for seat belt use): _____ Vehicles

Number of Seat Belt Observations Recorded in 60 min: _____ Vehicles

DATA COLLECTION FORM

Site #	Page #	1	2	3	4	5	6	7	8	9	10	
Occupants Not Observable	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Not Observable
Commercial Use Vehicle	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Commercial
Vehicle Type												Vehicle Type
Passenger Car	car	car	car	car	car	car	car	car	car	car	car	Passenger Car
SUV	suv	suv	suv	suv	suv	suv	suv	suv	suv	suv	suv	SUV
Van/Minivan	van	van	van	van	van	van	van	van	van	van	van	Van/Minivan
Pickup Truck	PT	PT	PT	PT	PT	PT	PT	PT	PT	PT	PT	Pickup Truck
Driver Belt Use												Driver Belt Use
Belted	Belt	Belt	Belt	Belt	Belt	Belt	Belt	Belt	Belt	Belt	Belt	Belted
Not Belted	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB	Not Belted
Unknown	Un	Un	Un	Un	Un	Un	Un	Un	Un	Un	Un	Unknown
Driver Cell Phone Use												Driver Cell Phone Use
Handheld (Talking)	talk	talk	talk	talk	talk	talk	talk	talk	talk	talk	talk	Handheld (Talking)
Handheld (Typing)	type	type	type	type	type	type	type	type	type	type	type	Handheld (Typing)
Hands-free (E.P.)	EP	EP	EP	EP	EP	EP	EP	EP	EP	EP	EP	Hands-free (E.P.)
Hands-free (No E.P.)	NEP	NEP	NEP	NEP	NEP	NEP	NEP	NEP	NEP	NEP	NEP	Hands-free (No E.P.)
None	N	N	N	N	N	N	N	N	N	N	N	None
Driver Age												Driver Age
16-29	16-29	16-29	16-29	16-29	16-29	16-29	16-29	16-29	16-29	16-29	16-29	16-29
30-59	30-59	30-59	30-59	30-59	30-59	30-59	30-59	30-59	30-59	30-59	30-59	30-59
60+	60+	60+	60+	60+	60+	60+	60+	60+	60+	60+	60+	60+
Unknown	Un	Un	Un	Un	Un	Un	Un	Un	Un	Un	Un	Unknown
Driver Gender												Driver Gender
Male	M	M	M	M	M	M	M	M	M	M	M	Male
Female	F	F	F	F	F	F	F	F	F	F	F	Female
Unknown	Un	Un	Un	Un	Un	Un	Un	Un	Un	Un	Un	Unknown
Driver Race												Driver Race
White	W	W	W	W	W	W	W	W	W	W	W	White
Black	B	B	B	B	B	B	B	B	B	B	B	Black
Other	O	O	O	O	O	O	O	O	O	O	O	Other
Unknown	Un	Un	Un	Un	Un	Un	Un	Un	Un	Un	Un	Unknown
Passenger Belt Use												Passenger Belt Use
Belted	Belt	Belt	Belt	Belt	Belt	Belt	Belt	Belt	Belt	Belt	Belt	Belted
Not Belted	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB	Not Belted
Unknown	Un	Un	Un	Un	Un	Un	Un	Un	Un	Un	Un	Unknown
Passenger Age												Passenger Age
0-15	<15	<15	<15	<15	<15	<15	<15	<15	<15	<15	<15	0-15
16-29	16-29	16-29	16-29	16-29	16-29	16-29	16-29	16-29	16-29	16-29	16-29	16-29
30-59	30-59	30-59	30-59	30-59	30-59	30-59	30-59	30-59	30-59	30-59	30-59	30-59
60+	60+	60+	60+	60+	60+	60+	60+	60+	60+	60+	60+	60+
Unknown	Un	Un	Un	Un	Un	Un	Un	Un	Un	Un	Un	Unknown
Passenger Gender												Passenger Gender
Male	M	M	M	M	M	M	M	M	M	M	M	Male
Female	F	F	F	F	F	F	F	F	F	F	F	Female
Unknown	Un	Un	Un	Un	Un	Un	Un	Un	Un	Un	Un	Unknown
Passenger Race												Passenger Race
White	W	W	W	W	W	W	W	W	W	W	W	White
Black	B	B	B	B	B	B	B	B	B	B	B	Black
Other	O	O	O	O	O	O	O	O	O	O	O	Other
Unknown	Un	Un	Un	Un	Un	Un	Un	Un	Un	Un	Un	Unknown

Note: E.P. = Earpiece

APPENDIX II
Resumes of Timothy J. Gates and Peter T. Savolainen

Dr. Timothy J. Gates

Summary

Dr. Timothy J. Gates is the current Principal Investigator of the Direct Observation Survey of Seat Belt Use. Dr. Gates is a Professor in the Michigan State University (MSU) Department of Civil and Environmental Engineering. He has more than 10 years of experience with direct observation surveys of safety restraint use. This includes a diverse range of experiences in sample design and selection, field data collection methods, observer training, statistical systems development, and optimization techniques. He also has expertise in the areas of survey research methodology, data processing, and statistical quality control.

Education

Ph.D., Civil Engineering, University of Wisconsin, 2007
M.S., Civil Engineering, Michigan State University, 2000
B.S., Civil Engineering, Michigan State University, 1999

Professional Associations

Institute of Transportation Engineers
Transportation Research Board

Computer Skills

Operation Systems: Windows, iOS
Software: SPSS, Microsoft PowerPoint, Excel, and Word

Relevant Project Experience (2007 to Present)

Direct Observation Surveys of Seat Belt Use: PI or co-PI on OHSP-sponsored Michigan seat belt use survey from FY2012 to present. Participated in proposal development, planning, survey implementation, data collection, quality control, data analysis, and report preparation. Led the resampling of Michigan's 200 seat belt observation sites in 2018 and 2023.

Direct Observation Surveys of Commercial Motor Vehicle Seat Belt Use: Co-PI on OHSP-sponsored Michigan seat belt use survey for commercial motor vehicle occupants during FY 2012 and 2015.

Direct Observation Surveys of Child Restraint Device Use and Misuse (including Booster Seat Use): PI or co-PI on OHSP-sponsored child restraint device use/misuse survey, including booster seats, in FY 2009, 2011, 2013, 2015, 2018, and 2022.

Direct Observation Surveys of Motorcycle Helmet Use: Co-PI on OHSP-sponsored motorcycle helmet use survey in FY 2013 and 2017.

Dr. Peter T. Savolainen

Summary

Dr. Peter T. Savolainen is an MSU Foundation Professor in the Michigan State University Department of Civil and Environmental Engineering. Dr. Savolainen serves as the lead statistical advisor for this project. Prior to joining Michigan State University in 2018, he was an Associate Professor of Civil Engineering at Iowa State University (2014-2018) and Wayne State University (2006-2014). He has more than 11 years of experience with direct observation surveys of safety restraint use. This includes a diverse range of experiences in sample design and selection, data weighting, imputation, variance estimation, statistical systems development, and optimization techniques. He also has expertise in the areas of survey research methodology, data processing, and statistical quality control. Dr. Savolainen also teaches graduate-level courses on civil engineering research methods and applications, as well as statistics and econometric methods of data analysis. He is a proficient user of various statistical analysis software packages, including LIMDEP, SAS, SPSS, and SUDAAN.

Education

Ph.D., Civil Engineering, Purdue University, 2006
M.S., Civil Engineering, Purdue University, 2004
B.S., Civil Engineering, Michigan Technological University, 2002

Professional Associations

American Society of Civil Engineers
American Statistical Association
Institute of Transportation Engineers

Computer Skills

Operation Systems: Windows, MacOS, iOS
Software: LIMDEP, SAS, SPSS, SUDAAN, Microsoft PowerPoint, Excel, and Word

Relevant Project Experience (2006 to Present)

Direct Observation Surveys of Seat Belt Use: PI or co-PI on OHSP-sponsored Michigan seat belt use survey from FY 2008 to 2010 and FY 2012 to present. Participated in proposal development, planning, survey implementation, data collection, quality control, data analysis, and report preparation. Led development of the federally-approved seat belt observational survey methodology for the state of Michigan in 2012.

Direct Observation Surveys of Commercial Motor Vehicle Seat Belt Use: Co-PI on OHSP-sponsored Michigan seat belt use survey for commercial motor vehicle occupants during FY 2012.

Direct Observation Surveys of Child Restraint Device Use and Misuse (including Booster Seat Use): PI or co-PI on OHSP-sponsored child restraint device use/misuse survey, including booster seats, in FY 2009, 2011, 2013, 2015, 2018, and 2022.

Direct Observation Surveys of Motorcycle Helmet Use: Co-PI on OHSP-sponsored motorcycle helmet use survey in FY 2013.

APPENDIX III

List of Annual Observation Locations by County, Stratum, and Road Classification, Including Seat Belt Observation Data

Belt Use Stratum	County	Site Location	Site Type	Road Type	Actual Observations		Non-Response Obs.	Sample Weight
					Belted	Total		
1	Ingham	I-96 WB and M L King Blvd (Exit 101)	Original	Primary	136	141	0	40142.1
1	Kalamazoo	I-94 EB and S 9th Street (Exit 72)	Original	Primary	72	75	0	41049.1
1	Kalamazoo	US-131 NB and Stadium Drive EB (Exit 36 for BUS 94)	Original	Primary	94	104	0	139720.0
1	Kalamazoo	US-131 NB and W Main Street (Exit 38A for Kalamazoo)	Original	Primary	238	240	0	35435.3
1	Kalamazoo	US-131 and D Ave (Exit 44)	Original	Primary	132	134	0	30061.8
1	Oakland	I-75 SB and E Square Lake Road (Exit 74 for Adams Road)	Original	Primary	135	139	0	73560.0
1	Oakland	Northwestern Highway NWB (Lodge Srv. Drv.) and Lahser Road	Original	Primary	90	105	0	173863.9
1	Oakland	I-96 EB and Milford Road (Exit 155)	Original	Primary	128	131	0	75584.0
1	Washtenaw	US-23 SB and Six Mile Road (Exit 50)	Original	Primary	120	125	0	25911.9
1	Washtenaw	US-23 SB and Carpenter Road (Exit 27)	Original	Primary	145	152	0	35906.4
1	Washtenaw	I-94 WB and Jackson Road/Old US-12 (Exit 162)	Original	Primary	140	144	0	36446.4
1	Washtenaw	US-23 SB and US-12 (Exit 34 to Saline)	Original	Primary	100	103	0	102521.6
1	Washtenaw	I-94 EB and Michigan Ave (Exit 181)	Original	Primary	96	98	0	72243.4
1	Washtenaw	US-23 SB and Washtenaw Ave (Exit 37B to Ann Arbor)	Original	Primary	120	127	0	84726.7
1	Washtenaw	US-23 SB and Plymouth Road (Exit 41)	Original	Primary	131	135	0	82455.2
1	Ingham	E M-106/Morton Road and N Clinton Street/M-106	Original	Secondary	84	97	0	11005.3
1	Ingham	M-52/Main Street/Stockbridge Road and N Clinton Street/M-106	Original	Secondary	140	147	0	13501.3
1	Ingham	M-36/Topping Road and M-52 (Stockbridge Road)	Original	Secondary	30	31	0	11357.0
1	Ingham	M-36/Dansville Road and M-52	Original	Secondary	41	47	0	10854.0
1	Ingham	I-96 BUS LOOP/S M-43 Hwy/E Oakland Ave and N Pennsylvania Ave	Original	Secondary	139	147	0	34251.8
1	Ingham	M-143/Michigan Ave and N Harrison Road	Original	Secondary	104	106	0	20754.4
1	Ingham	M-43/E. Grand River Ave and Northwind Drive	Original	Secondary	131	140	0	40322.5
1	Ingham	M-43/Grand River Avenue and Dobie Road/Central Park Drive	Original	Secondary	112	124	0	32753.6
1	Ingham	M-36 and S Jefferson Street	Original	Secondary	119	123	0	17100.0
1	Ingham	Cedar Street and College Road	Original	Secondary	125	133	0	19454.5
1	Kalamazoo	US-131 and Lyons Street	Original	Secondary	89	100	0	68507.5
1	Kalamazoo	M-96/Battle Creek Street and Burgess Drive	Original	Secondary	117	121	1	10424.8
1	Kalamazoo	M-96 (E. Michigan Ave) and S 35th Street	Original	Secondary	133	139	0	24778.8
1	Kalamazoo	BUS US-94/AmVets Mem Parkway and S Sprinkle Road	Original	Secondary	93	97	0	15830.9
1	Kalamazoo	M-96/King Highway and River Street	Original	Secondary	95	109	2	15257.3
1	Kalamazoo	Gull Road and N Sprinkle Road	Original	Secondary	144	148	1	37220.3
1	Kalamazoo	BUS US-94/AmVets Mem Parkway and N Park Street	Original	Secondary	194	204	0	29115.1
1	Oakland	US-24/Telegraph Road and Voorheis Street	Original	Secondary	135	148	0	76838.2
1	Oakland	M-59/E Huron Street and Woodward Ave (NB)	Original	Secondary	145	151	0	37269.9
1	Oakland	BUS US-24/N Cass Ave and N Johnson Street	Original	Secondary	141	151	0	15486.8
1	Oakland	M-1/Woodward Ave and Catalpa Drive	Original	Secondary	118	130	0	105826.3
1	Oakland	M-1/Woodward Ave and E Maple Road	Original	Secondary	111	119	0	128024.0
1	Oakland	M-1/Woodward Ave and W Big Beaver Road	Original	Secondary	117	123	0	96111.9
1	Oakland	M-59/Highland Road EB and N. Milford Road	Original	Secondary	126	128	0	64356.2
1	Oakland	M-59/Highland Road WB and Duck Lake Road	Original	Secondary	125	133	0	32436.2
1	Oakland	M-1/Woodward Ave and W Nine Mile Road	Original	Secondary	103	110	0	162324.3
1	Washtenaw	M-52/Ann Arbor Street and E Main Street	Original	Secondary	135	148	0	15526.2
1	Washtenaw	US-12/Michigan Avenue and Munger Road/Cloverlane Drive	Original	Secondary	99	106	0	66902.9
1	Washtenaw	N Huron Street and W Cross Street	Original	Secondary	94	97	0	27713.2
1	Washtenaw	M-153/Ford Road and N Prospect Road	Original	Secondary	115	115	0	56691.0
1	Oakland	Hollywood Ave and W Columbia Ave	Original	Local	11	14	0	1778460.2
1	Oakland	Brown Road EB and Joslyn Road	Original	Local	156	163	0	11234358.0
1	Oakland	Wellington Road and Franklin Road	Original	Local	55	61	0	1875467.2
1	Washtenaw	Ferris Street and S. Hamilton Street	Original	Local	20	21	0	2045229.3
1	Washtenaw	S 7th Street and W Liberty Street	Original	Local	132	138	0	5010469.7

Belt Use Stratum	County	Site Location	Site Type	Road Type	Actual Observations		Non-Response Obs.	Sample Weight
					Belted	Total		
2	Allegan	I-196 EB and M-40/Lincoln Road (Exit 49 to Allegan)	Original	Primary	30	34	0	60586.2
2	Allegan	I-196 NB and 109th Ave (Exit 26 to Pullman)	Original	Primary	56	58	0	50986.8
2	Allegan	I-196 NB and M-89 (Exit 34 to Fennville - 124th Ave)	Original	Primary	122	122	0	53039.6
2	Allegan	I-196 NB and Blue Star Highway (Exit 41)	Original	Primary	83	83	0	51771.2
2	Bay	I-75 NB and Beaver Road (Exit 168)	Original	Primary	98	100	0	67795.6
2	Calhoun	I-94 WB and 26 Mile Road (Exit 119 for M-199)	Original	Primary	16	18	0	46737.9
2	Eaton	I-69 SB and M-78/Butterfield Highway (Exit 48 to Bellevue)	Original	Primary	25	26	0	68994.0
2	Jackson	I-94 WB and Race Road	Original	Primary	21	22	0	53414.7
2	Kent	US-131 NB and M-57/14 Mile Road NE (Exit 101 to Sparta/Greenville)	Original	Primary	171	184	0	94783.1
2	Kent	I-96 EB and M-50/Alden Nash Ave SE (Exit 52 to Lowell/Charlotte)	Original	Primary	133	135	0	134760.9
2	Kent	I-196 EB and Fuller Ave NE (Exit 79)	Original	Primary	106	109	1	129827.5
2	Midland	US-10 WB and N W River Road	Original	Primary	123	130	0	75999.9
2	Midland	US-10 WB and Eastman Ave (Exit 122)	Original	Primary	121	134	0	187730.5
2	Monroe	US-23 SB and M-50/Tecumseh Street (Exit 17 to Dundee/Monroe)	Original	Primary	154	163	0	68571.6
2	Ottawa	I-196 EB and 32nd Ave (Exit 62 to Hudsonville)	Original	Primary	67	69	0	72231.3
2	Allegan	M-43/Bridge Street and Sherwood Ave	Original	Secondary	200	206	0	53359.7
2	Allegan	M-40/Jenner Drive and Marshall Street/Cedar Street	Original	Secondary	157	159	0	47625.7
2	Bay	M-13/Huron Road and Linwood Road	Original	Secondary	138	146	0	51986.4
2	Bay	M-84/E Salzburg Road and M-13/Euclid Ave	Original	Secondary	134	137	0	32228.0
2	Bay	M-13/Broadway Street and Fremont Ave	Original	Secondary	125	133	0	79142.1
2	Calhoun	M-66/Capital Ave and Burr Oak Street	Original	Secondary	131	139	0	38218.4
2	Calhoun	Michigan Ave and Eagle Street	Original	Secondary	120	128	0	71187.1
2	Calhoun	M-99/Superior Street and Erie Street	Original	Secondary	111	121	0	42441.7
2	Calhoun	M-66 and B Drive S	Original	Secondary	98	102	0	96795.2
2	Eaton	Lansing Road and N Canal Road	Original	Secondary	75	80	0	35877.2
2	Eaton	M-79/Lawrence Ave and Lincoln Street	Original	Secondary	109	129	1	37973.6
2	Eaton	M-50/N Cochran Ave and Lawrence Ave	Original	Secondary	115	124	0	48021.4
2	Grand Traverse	US-31 and M-72/Shores Beach Lane	Original	Secondary	79	86	0	75204.5
2	Grand Traverse	US-31/M-72/Munson Ave and Holiday Road	Original	Secondary	141	155	0	151394.4
2	Grand Traverse	US-31/Beitner Road and US-31/M-37	Original	Secondary	135	143	0	44634.4
2	Grand Traverse	M-113/Main Street and Brownson Ave	Original	Secondary	152	166	0	41610.8
2	Jackson	M-50/Main Street and Constitution Street	Original	Secondary	141	150	0	80525.6
2	Jackson	Spring Arbor Road and Dearing Road	Original	Secondary	129	132	0	70734.2
2	Kent	M-37 and 12 Mile Road NW	Original	Secondary	123	135	0	47476.8
2	Kent	M-57/14 Mile Road NE and Lincoln Lake Road NE	Original	Secondary	144	164	0	85280.8
2	Kent	Alden Nashe Ave SE and 92nd Street SE	Original	Secondary	137	148	0	37735.3
2	Kent	M-11/28th Street SW and Ivanreset Ave SW	Original	Secondary	95	105	0	270878.1
2	Livingston	Grand River Ave and National Street	Original	Secondary	129	135	0	168686.9
2	Monroe	M-50/Tecumseh Street and Helle Boulevard/Cabela Boulevard	Original	Secondary	146	152	0	36715.4
2	Ottawa	US-31 NB and Hayes Street	Original	Secondary	99	102	0	119202.7
2	Ottawa	US-31 SB and Ferris Street	Original	Secondary	99	103	0	101579.3
2	Ottawa	M-45/Lake Michigan Drive and 48th Ave	Original	Secondary	111	124	1	113772.4
2	Ottawa	US-31 SB and Port Sheldon Street	Original	Secondary	120	132	0	78020.2
2	Ottawa	9th Street and Columbia Ave	Original	Secondary	127	129	0	57893.3
2	Ottawa	Chicago Drive and 36th Ave	Original	Secondary	167	175	0	70873.5
2	Bay	9 Mile Road and W Parish Road	Original	Local	8	13	0	2618199.1
2	Calhoun	N 20th Street and Goguac Street	Original	Local	108	117	1	4879371.1
2	Eaton	Curtis Road and Nashville Highway/Reed Street	Original	Local	13	14	0	2356379.2
2	Kent	Portland Ave and Leonard Street	Original	Local	23	24	0	2356379.2
2	Monroe	Sumpter Road and Stony Creek Road	Original	Local	18	19	0	2749109.1

Belt Use Stratum	County	Site Location	Site Type	Road Type	Actual Observations		Non-Response Obs.	Sample Weight
					Belted	Total		
3	Berrien	I-196 NB and M-63/Hagar Shore Road (Exit 7)	Original	Primary	15	16	0	52542.7
3	Berrien	US-31 NB/St. Joseph Valley Parkway and M-139/Old 31 (Exit 15A to B)	Original	Primary	41	45	0	52812.2
3	Clare	US-127 NB and BUS US-127/Clare Ave (Exit 176 to Old 27)	Original	Primary	42	45	0	64024.3
3	Clare	US-127 NB and BUS US-127/Clare Ave (Exit 170 to Harrison/Gladwin)	Original	Primary	121	133	0	91006.7
3	Clare	US-10/127 SB and BUS US-127/Clare Ave (Exit 160 to Clare)	Original	Primary	124	138	0	85151.1
3	Clinton	US-127 SB and E Round Lake Road (Exit 86)	Original	Primary	101	102	0	57213.2
3	Genesee	I-69 EB and M-15/State Road (Exit 145 to Davison/Clarkston)	Original	Primary	135	138	0	220270.8
3	Isabella	US-127 SB and M-20/Pickard Street (Exit 143 for Midland/Big Rapids)	Original	Primary	47	48	0	49039.9
3	Lapeer	I-69 EB and Wilder Road (Exit 159)	Original	Primary	84	88	0	49685.1
3	Lapeer	I-69 EB and Lake Pleasant Road (Exit 163)	Original	Primary	112	118	1	58174.8
3	Shiawassee	I-69 EB and Woodbury Road (Exit 98 to Lainsburg)	Original	Primary	148	154	0	69064.5
3	St. Clair	I-94 WB and Range Road (Exit 269)	Original	Primary	53	59	1	66694.2
3	St. Clair	I-94 EB and Fred W Moore Highway (Exit 257 to St. Clair)	Original	Primary	100	109	0	66672.2
3	St. Clair	I-69 EB and M-19/Kinney Road (Exit 184 to Sandusky/Richmond)	Original	Primary	125	136	1	67821.1
3	Van Buren	I-94 WB and County Road 365 (Exit 52 to Lawrence)	Original	Primary	108	116	0	57724.0
3	Barry	M-66 and M-50	Original	Secondary	116	125	0	49959.6
3	Barry	M-43 and Green Street/Heath Road	Original	Secondary	88	93	0	144836.6
3	Berrien	M-139/Ferry Street and M-139/Old 31	Original	Secondary	141	156	0	101118.7
3	Cass	M-152 and M-51	Original	Secondary	110	122	0	51524.6
3	Clare	M-115/5th Street and McEwan Street	Original	Secondary	107	130	0	262698.2
3	Clinton	BUS I-96/Grand River Ave and Airport Road	Original	Secondary	122	135	0	123008.9
3	Genesee	M-54/Saginaw Road and M-57/Vienna Road	Original	Secondary	147	154	0	170922.8
3	Isabella	M-20/Remus Road and S Lincoln Road	Original	Secondary	159	163	0	130820.2
3	Isabella	M-20/Remus Road and S Winn Road	Original	Secondary	159	165	0	123812.0
3	Lapeer	M-24/Lapeer Road and W Dryden Road	Original	Secondary	130	134	0	407255.7
3	Lenawee	M-34 and Scott Street/Red River Drive	Original	Secondary	111	122	0	108460.6
3	Lenawee	US-12 and M-52	Original	Secondary	110	120	0	85500.3
3	Montcalm	M-46/Howard City Edmore and Federal Road	Original	Secondary	119	124	0	91130.1
3	Montcalm	M-66 and M-46	Original	Secondary	89	95	0	46721.5
3	Montcalm	M-57/Washington Street/Carson City Road and M-91/Lafayette Street	Original	Secondary	132	148	0	115788.1
3	Muskegon	BUS US-31/Seaway Drive and Hoyt Street	Original	Secondary	82	83	0	298561.8
3	Muskegon	M-37/Maple Street and State Road	Original	Secondary	134	142	0	164303.9
3	Newaygo	M-82/Curve Street/Croton Drive and M-37/Evergreen Drive	Original	Secondary	120	124	0	165322.2
3	Newaygo	Monroe Street and M-37/Evergreen Drive	Original	Secondary	35	36	0	46721.5
3	Saginaw	M-15/Vassar Road and M-81/Washington Road	Original	Secondary	99	103	0	181515.7
3	Saginaw	M-57/Brady Road and M-52/Oakley Road	Original	Secondary	132	141	1	133490.0
3	St. Clair	M-29/Dixie Highway and Palms Road	Original	Secondary	121	137	0	133037.5
3	St. Joseph	US-12/Chicago Road and US-131	Original	Secondary	55	61	0	147541.6
3	Tuscola	M-81/State Street and Frank Street	Original	Secondary	144	148	0	137439.1
3	Tuscola	M-24/Mertz Road and M-46/Sanilac Road	Original	Secondary	146	153	0	65410.1
3	Tuscola	M-46/Sanilac Road and M-24/Mertz Road	Original	Secondary	120	124	0	58630.9
3	Tuscola	M-81/Cass City Road and Seeger Street	Original	Secondary	137	146	0	76311.8
3	Tuscola	M-153/Ford Road and M-46/Sanilac Road	Original	Secondary	115	119	0	51101.6
3	Van Buren	M-43 and M-40	Original	Secondary	182	184	0	85747.7
3	Van Buren	M-43 and Blue Star Highway	Original	Secondary	134	143	0	69722.9
3	Clinton	Essex Center Road and M-21	Original	Local	11	12	0	2633169.0
3	Genesee	Genesee Street and Flint Street	Original	Local	29	30	0	2633169.0
3	Lapeer	Clear Lake Road and M-53/Van Dyke Road	Original	Local	40	42	0	2633169.0
3	Muskegon	Hendrick Road and Henry Street	Original	Local	3	4	0	2633169.0
3	Saginaw	Freeland Road and M-47/Main Street	Original	Local	126	134	0	6069677.7

Belt Use Stratum	County	Site Location	Site Type	Road Type	Actual Observations		Non-Response Obs.	Sample Weight
					Belted	Total		
4	Macomb	I-94 EB and Little Mack (Exit 232)	Original	Primary	85	86	0	64648.7
4	Wayne	I-75 SB and Eureka Road (Exit 36)	Original	Primary	129	135	1	65972.1
4	Wayne	I-75 SB and Northline Road (Exit 37)	Original	Primary	118	128	0	83457.6
4	Wayne	M-39 NB and Outer Drive (Exit 3)	Original	Primary	126	144	0	53281.6
4	Wayne	I-75 SB and Clark Ave (Exit 47A)	Original	Primary	128	134	0	35533.2
4	Wayne	I-75 NB and Springwell Street (Exit 45)	Original	Primary	149	164	0	32430.9
4	Wayne	M-39/Southfield Freeway and Rotuna Drive (Exit 5)	Original	Primary	126	139	0	38783.7
4	Wayne	I-94 EB and Haggerty Road (Exit 192)	Original	Primary	98	107	0	23164.9
4	Wayne	I-75 SB and Clay Street (Exit 54)	Original	Primary	86	99	0	47567.1
4	Wayne	M-10 NB and 7 Mile (Exit 12)	Original	Primary	84	99	2	78960.3
4	Wayne	M-14 EB and Beck Road (Exit 18)	Original	Primary	121	133	0	53428.8
4	Wayne	I-275 NB and Ann Arbor Road (Exit XX)	Original	Primary	108	129	1	46886.6
4	Wayne	I-275 SB and Six Mile Road (Exit 170)	Original	Primary	137	149	0	89668.8
4	Wayne	I-96 EB and Farmington Road (Exit 174)	Original	Primary	123	131	0	128084.0
4	Wayne	I-96 EB and Inkster Road (Exit 177)	Original	Primary	128	139	0	196942.8
4	Macomb	M-19/Main Street and Division Road	Original	Secondary	154	160	3	22048.6
4	Macomb	New Haven Road/Main Street and M-19/Gratiot Ave	Original	Secondary	132	147	0	21997.6
4	Macomb	M-3/Gratiot Ave and 23 Mile Road	Original	Secondary	123	149	0	48868.8
4	Macomb	M-53 SB and 32 Mile Road	Original	Secondary	142	156	1	36459.9
4	Macomb	M-53/Van Dyke Ave and 17 Mile Road	Original	Secondary	117	127	0	61795.3
4	Macomb	M-59/Hall Road and Van Dyke Ave	Original	Secondary	118	133	0	119517.7
4	Macomb	M-59/Hall Road and Garfield Road	Original	Secondary	118	128	0	123790.9
4	Macomb	M-59/Hall Road and Romeo Plank Road	Original	Secondary	117	126	0	105215.5
4	Macomb	M-3/Gratiot Ave and Martin Road	Original	Secondary	88	102	0	98552.0
4	Macomb	M-3/Gratiot Ave and 12 Mile Road	Original	Secondary	98	105	0	74274.5
4	Macomb	M-97/Groesbeck Highway and 15 Mile Road	Original	Secondary	93	100	1	39090.6
4	Macomb	M-39/Southfield Road and Lafayette Boulevard	Original	Secondary	135	148	0	73286.0
4	Wayne	M-85/Fort Street and Ford Ave/Northline Road	Original	Secondary	89	94	0	99463.7
4	Wayne	M-85/Fort Street and Pennsylvania Road	Original	Secondary	101	106	1	97605.1
4	Wayne	M-85/Fort Street and Vreeland Road	Original	Secondary	87	93	0	24640.2
4	Wayne	M-85/Fort Street and Gibraltar Road	Original	Secondary	69	71	0	38985.5
4	Wayne	US-24/Telegraph Road and Van Born Road	Original	Secondary	133	153	0	64098.9
4	Wayne	M-39/Southfield Road and Toledo Road	Original	Secondary	123	135	0	137122.0
4	Wayne	M-85/Fort Street and Outer Drive	Original	Secondary	115	124	0	59234.2
4	Wayne	US-12/Michigan Ave and Schlaff Street	Original	Secondary	145	151	0	44668.9
4	Wayne	M-153/Ford Road and Chase Road	Original	Secondary	120	145	0	54868.6
4	Wayne	US-12/Michigan Ave and Haggerty Road	Original	Secondary	121	126	0	85442.7
4	Wayne	M-153/Ford Road and Silvery Lane	Original	Secondary	119	127	0	73914.0
4	Wayne	M-153/Ford Road and US-24/Telegraph Road	Original	Secondary	102	121	0	58551.8
4	Wayne	M-153/Ford Road and Outer Drive	Original	Secondary	111	122	0	62705.4
4	Wayne	M-102/8 Mile Road and M-3/Gratiot	Original	Secondary	80	106	0	40395.6
4	Wayne	M-53/Van Dyke Ave and Outer Drive	Original	Secondary	96	113	2	15872.1
4	Wayne	M-5/Grand River Ave and Livernois	Original	Secondary	74	92	0	28420.3
4	Wayne	M-1/Woodward Ave and 7 Mile Road	Original	Secondary	85	89	1	27577.4
4	Wayne	US-12/Michigan Ave and Denton Road	Original	Secondary	118	128	0	44577.8
4	Macomb	School Section Road and Memphis Ridge Road	Original	Local	47	51	0	1918123.6
4	Macomb	Rinaldi Drive and 18 Mile Road	Original	Local	15	18	0	1604704.7
4	Macomb	Vegas Drive and Masonic	Original	Local	5	5	0	1504410.6
4	Wayne	Belton Street and US-24/Telegraph Road	Original	Local	29	33	0	1654851.7
4	Wayne	Pembroke Ave and Livernois	Original	Local	22	28	0	2005880.9