



Observational Survey of Seat Belt Use in Ohio 2023

Final Report

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Ohio Department of Public Safety

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University
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OBSERVATIONAL SURVEY OF SEAT BELT USE IN OHIO - 2023

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This project is a demonstration of each agency's ongoing efforts to reduce traffic fatalities by increasing seat belt use. This work has a measurable, lasting impact on driver and passenger safety throughout the state of Ohio. The research team is honored to have the opportunity to work with a group of individuals that have such a passion for the work they do, and the chance to increase Ohioan safety in such a dramatic manner.

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CHAPTER I – INTRODUCTION

The purpose of this study is to help the National Highway Traffic Safety Administration (NHTSA) and the Ohio Department of Public Safety (DPS) obtain standardized restraint use information for the state of Ohio. This study is also designed to help NHTSA and DPS determine the effectiveness of the annual national Click It or Ticket (CIOT) campaign, which was accomplished by performing seat belt surveys before and after the campaign. Furthermore, the results allow NHTSA and DPS to identify the geographic regions, vehicle types and occupant demographics related to low and high compliance rates. With this information, NHTSA and DPS may provide more targeted public information campaigns and law enforcement initiatives to increase restraint use and help save lives throughout Ohio.

The procedures outlined in this document were developed in compliance with federal requirements and in conjunction with both NHTSA and DPS to ensure state to state comparability. The success of this study is dependent on the quality of data gathered.

This report is broken into four chapters. In addition to the four chapters, appendices are included at the end of the report detailing supplementary information. The chapters are outlined below:

- Chapter I – Introduction: This chapter introduces the study scope and purpose. Additionally, this chapter outlines the organization of the report.
- Chapter II – Methodology: This chapter defines the methodology and statistical analysis that was developed and used to obtain, process, and present the studies' data.
- Chapter III – Results: This chapter presents the data that were collected in a detailed manner.
- Chapter IV – Conclusions & Recommendations: This chapter includes a discussion on the outcomes of the study and specifies key points that may be taken away from the data collected. This chapter also includes recommendations on how Ohio may improve seat belt usage in the future.

The research team believes that the proper use of the study conclusions will ultimately result in an increased seat belt usage rate throughout Ohio. In addition, the team believes that this study is an important tool for NHTSA and DPS to use in analyzing crashes and fatalities.

CHAPTER II – METHODOLOGY

The methodology for this study was derived based upon the NHTSA’s “*Uniform Criteria for State Observational Surveys of Seat Belt Use*”, previous Ohio studies, and similar studies from other states. The methodology was approved by NHTSA and is described in detail in the following sections. The research team notes that the methodology used in this year’s study is consistent with previous studies conducted in Ohio, allowing for a meaningful comparison of changes in compliance rates over time.

2.1 Sample Selection

2.1.1 Study Timeline

This study was conducted in two separate phases so that NHTSA and DPS would have the ability to assess the efficiency of the national CIOT campaign on improving seat belt compliance rates in Ohio. The first phase was conducted during the two weeks immediately preceding the CIOT campaign and these data were used to estimate the baseline compliance (i.e., seat belt use) rate in 2023. The second phase was conducted during the two weeks immediately following the CIOT campaign and was used to determine the post-intervention compliance rate. The dates of the two observations may be found in Table 1.

Table 1: Study Timeline

Start Date	End Date	Task
05/08/2023	05/21/2023	Baseline Observations
05/15/2023	06/04/2023	Click It or Ticket Campaign
06/05/2023	06/18/2023	Post-Intervention Observations

As seen in Table 1, this year’s study ran from May 8 to June 18, 2023.

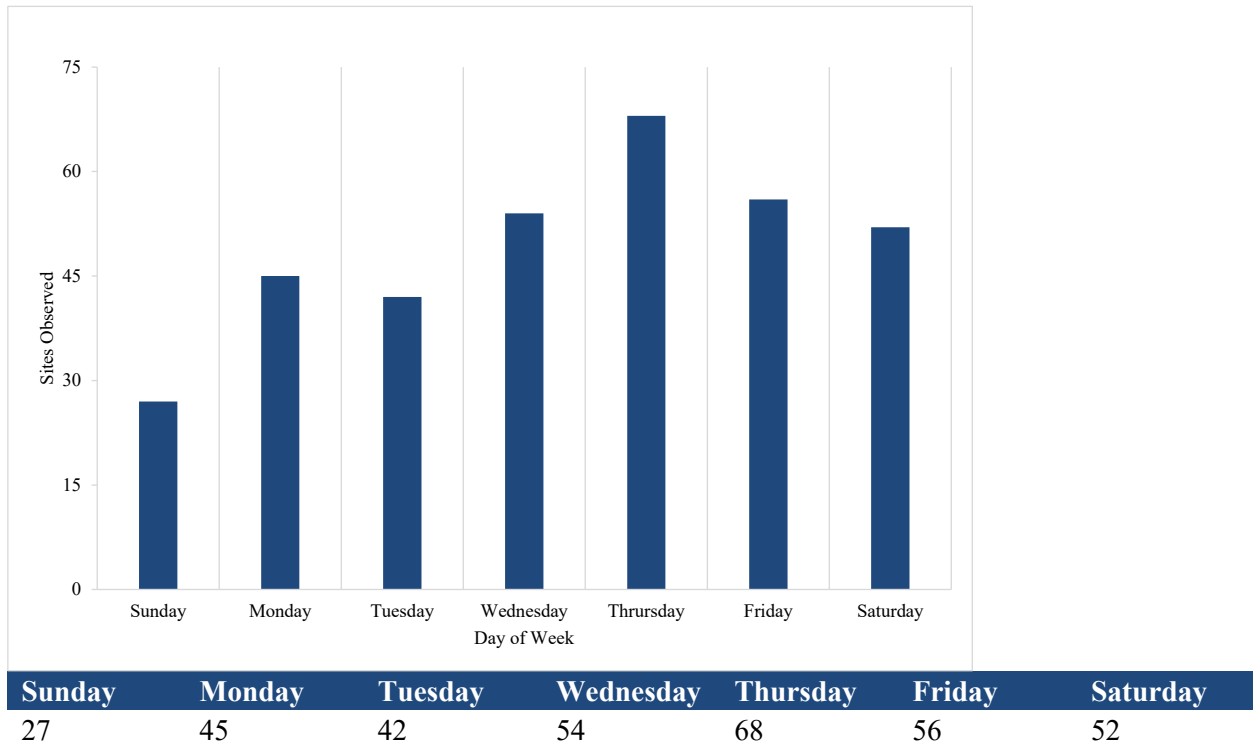
2.1.2 Site Selection

The site locations were updated this year. OTSO in discussion with UA decided that it was important to sample in all counties in the state. In total this year the state sampled 344 locations.

2.1.3 Site Distributions

To provide a representative sample of seat belt use throughout Ohio, the days of the week and times of the day for each observation location were assigned randomly. The randomized selection was produced using a random number generator in Microsoft Excel. These random numbers represented different days and start times. Sites that were geographically close to each other were clustered into groups to reduce travel and labor costs. The site groupings were then assigned a day and start time for the first site, with all other

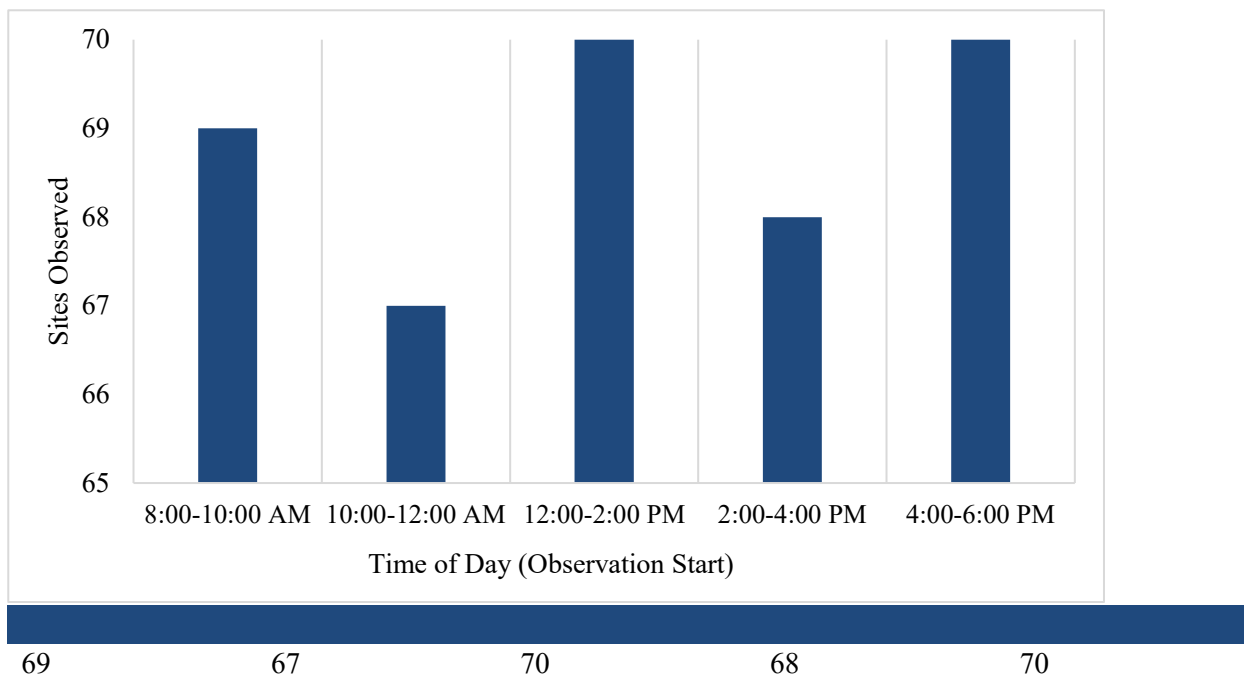
sites in the grouping following based on the next closest location. Figure 1 shows the distribution of sites observed per day of the week.



Note: Observation days were randomly assigned.

Figure 1: Site Distribution per Day of Week

As seen in Figure 1, the sites observed per day of the week are generally uniform. Due to the aggregation of sites and random selection, there is some variability with specific days (i.e. Thursday) including a larger number of sites than (i.e. Sunday). Figure 2 shows the sites observed per time of day.



Note: Observation start times were randomly assigned. Observations were conducted from 8:00 am to 6:00 pm with the last observation starting at 5:00 pm.

Figure 2: Site Distribution per Time of Day

As seen in Figure 2, the time allocations are consistent throughout the day. The difference between the least sampled site and the most sampled site is 3 sites.

2.2 Statistical Analysis

Rates for seat belt use were estimated for each survey individual site, as well as at the county and statewide levels. In addition, 95-percent confidence intervals for each use rate estimate were calculated. The methods applied in estimating these quantities are based on the approved protocol and are consistent with NHTSA’s “*Uniform Criteria for State Observational Surveys of Seat Belt Use.*” Details of the methods used to estimate seat belt use rate and variance are provided in this section.

2.2.1 Imputation

No imputation was done on missing data.

2.2.2 Sampling Weights

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

- g – Subscript for county
- h – Subscript for road segment type
- i – Subscript for road segment

- j – Subscript for directional of travel
- k – Subscript for lane of travel
- l – Subscript for vehicle

Under this stratified multistage sample design, the inclusion probability for each vehicle at a particular site is the product of the selection probabilities at each stage. The overall vehicle inclusion probability at a given site is shown in Equation 1.

$$\pi_{jkl} = \pi_j \pi_{k|j} \pi_{l|k} \quad \text{Equation 1}$$

where:

π_j = direction,
 $\pi_{k|j}$ = lane of travel, and
 $\pi_{l|jk}$ = vehicle.

The sampling weight (design weight) for each vehicle at a particular site shown in Equation 2.

$$w_{jkl} = \frac{1}{\pi_{jkl}} \quad \text{Equation 2}$$

where:

w_{jkl} = sampling weight.

At the site-level, the number of segments sampled was small relative to the number of segments in the population for each county-road segment type stratum. Consequently, no finite population correction factors were applied. The sampling weights for each segment are simply equal to the reciprocal of the proportion of segments sampled in each county-road type stratum as displayed in Equation 3.

$$w_{ghi} = \frac{N_{gh}}{n_{gh}} \quad \text{Equation 3}$$

where:

w_{ghi} = sampling weight for segment i of road segment type h in county g ,
 n_{gh} = number of segments sampled from road segment type stratum h of county g ; and
 N_{ghi} = total number of segments among road segment type stratum h of county g .

Thus, the overall inclusion probability of an individual vehicle is $\pi_{ghijkl} = \pi_{ghi} \pi_{jkl|ghi}$ and the sampling weight is $w_{ghijkl} = w_{ghi} w_{jkl|ghi}$.

2.2.3 Non-Response Adjustment

There are two instances by which non-response may arise with respect to data collection for the seat belt use survey. First, a site may be unobservable due to issues such as the presence of a construction work zone. In most instances, an alternative site is provided, and this site may be included without needing to adjust the sampling weights. The data collection protocol in the approved plan also includes provisions for instances where both the primary and alternative observation site are unavailable for observation.

Secondly, non-response may arise at the vehicle level in instances where the belt use of vehicle occupants was unobservable due to issues such as glare, tinted windows, etc. In these instances, the sampling weight for that site is increased by multiplying by the reciprocal of the response rate at that site, r_{ghi} . Thus, the sampling weight for each individual site is now defined as shown in Equation 4.

$$w_{ghi} = \frac{N_{gh}}{n_{gh}r_{ghi}} \quad \text{Equation 4}$$

2.2.4 Estimators

For each front-seat occupant observed, their seat belt use status was defined as seen in Equation 5.

$$y_{jkl|ghi} = \begin{cases} 1, & \text{if belt used} \\ 0, & \text{otherwise} \end{cases} \quad \text{Equation 5}$$

As such, within an individual observation site i of road segment type h in county g , the seat belt use rate (proportion) is estimated as presented in Equation 6.

$$\hat{p}_{ghi} = \frac{\sum w_{jkl|ghi} y_{jkl|ghi}}{\sum w_{jkl|ghi}} \quad \text{Equation 6}$$

The use rate (\hat{p}_{gh}) for road segment type h in county g is then determined using Equation 7.

$$\hat{p}_{gh} = \frac{\sum w_{ghi} \hat{p}_{ghi}}{\sum w_{ghi}} \quad \text{Equation 7}$$

At the county level, use rates (\hat{p}_g) for each road segment type are weighted by stratum-level VMT.

Equation 8 demonstrates this calculation.

$$\hat{p}_g = \frac{\sum_{\forall h} VMT_{gh} \hat{p}_{gh}}{\sum_{\forall h} VMT_{gh}} \quad \text{Equation 8}$$

where:

VMT_{gh} = total vehicle miles traveled for road segment type h in county g .

The use of the VMT-based estimator reduces a bias towards local road segments that is due to their relatively short length and low VMT as compared to primary and secondary roads. Similarly, the statewide use rates ($\hat{p}_{statewide}$) is simply an average of the county-level use rates, weighted by total county-level VMT among the three road segment classes as found in Equation 9.

$$\hat{p}_{statewide} = \frac{\sum_{\forall g} \sum_{\forall h} VMT_{gh} \hat{p}_{gh}}{\sum_{\forall g} \sum_{\forall h} VMT_{gh}} \quad \text{Equation 9}$$

2.2.5 Variance Estimation

The variance and standard error for each estimator was determined as detailed in this section. First, at the county-road segment class, the variance is calculated as displayed in Equation 10.

$$V(\hat{p}_{gh}) = \sum_{\forall h} \left[\frac{\left(\frac{N_{gh}}{N_g} \right)^2}{n_{gh}} \sum_{i=1}^{n_{gh}} \frac{(\hat{p}_{ghi} - \hat{p}_{gh})^2}{n_{gh} - 1} \right] \quad \text{Equation 10}$$

where:

$V(\hat{p}_{gh})$ = Estimated variance within road segment class h of county g ,

N_{gh} = Total number of road segments of type h in county g ,

N_g = Total number of road segments of all types in county g ,

n_{gh} = Number of locations sampled among road segment type h in county g ,

\hat{p}_{ghi} = Estimated belt use rate at location i in road segment type h in belt use group g , and

\hat{p}_g = Estimated belt use rate in road segment type h in belt use group g .

When a road segment stratum includes less than two sites, it is aggregated with the adjacent stratum.

Consequently, this aggregation involved either the local segments being combined with the secondary segments, or the primary segments being combined with the secondary segments. From here, the county-level variance is given by Equation 11.

$$V(\hat{p}_g) = \frac{\sum_{\forall h} VMT_{gh}^2 \times V(\hat{p}_{gh})}{\left(\sum_{\forall h} VMT_{gh} \right)^2} \quad \text{Equation 11}$$

Finally, the state-level variance is calculated similarly using Equation 12.

$$V(\hat{p}_{statewide}) = \frac{\sum_{\forall g \forall h} VMT_{gh}^2 \times V(\hat{p}_{gh})}{\left(\sum_{\forall g \forall h} VMT_{gh} \right)^2} \quad \text{Equation 12}$$

For each estimate, the standard error of use rate is found by simply taking the square root of the estimated variance. The 95-percent confidence interval of each use rate is 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.

2.2.6 Non-Response Rate

According to NHTSA's guidelines, the non-response rate for the annual seat belt survey cannot exceed 10%. Within the context of this study, a non-response occurs when the observer was not able to determine the safety belt use of a front seat vehicle occupant. This may 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 'unknown belt use' to keep a record of these non-responses. There was a total of 116 non-response observations for post-CIOT which represents less than 0.47% of the total number of observations. This non-response rate was well below the allowable maximum of 10% established by NHTSA.

2.3 Data Collection

The nature of this study requires a large amount of data to be collected in a very short period. Due to this, NHTSA, DPS, University of Akron (UA) and the observers must operate and communicate clearly. Much of the work for this study is completed before any observations even begin, preparing, organizing and distributing material needed for the study.

2.3.1 Observer Training

The success of this study is completely dependent on the quality of data that is recorded. Due to this, it is critical that the observers are trained in a thorough and complete manner with respect to properly recording the data. A mandatory online training session was organized and led by the UA principal investigator via Microsoft Teams the week before the first phase of observations were to start. Any observers that were not able to attend the training meeting were trained separately with UA. It is important to note that the observers in this study are retired state patrol officers and not students. This added experience in the field improves the overall quality of the data.

2.3.2 Vehicle Classification

This study is built to differentiate seat belt use between five different vehicle classes. These include passenger cars (PC), sport utility vehicles (SUV), van/minivan (V), light truck (LT) and heavy truck (HT) up to a gross vehicle weight rating (GVWR) of 10,000 pounds or less. Light trucks include vehicles with an estimated GVWR of less than 6,000 pounds and include light-duty pickup trucks. Heavy trucks include

vehicles with an estimated GVWR of 6,001-10,000 pounds and include full-size pickup trucks, utility vans and step vans; however, does not include walk-in trucks or delivery trucks.

2.3.3 Field Procedure

The field data collection procedure was communicated to the observers through the mandatory training session and a set of printed instructions. For each site, the observer prepared him/herself by reviewing the imagery provided for each site. Once at the site, the observer found a safe place to setup and began to collect data. Traffic counts were collected throughout the hour-long observation. Seat belt compliance observations were observed in the lane closest to the observer. The forms used to collect data may be found in Appendix A. The observers conducted site observations in a safe area near the study site.

CHAPTER III – RESULTS

This chapter includes the results of the 2023 Ohio Seat Belt Study. Each type of dataset that was collected is broken into an individual section. Each section typically contains a chart and table to visualize the data. There are thirteen sections in this chapter as follows:

- [Section 3.1](#): Statewide Compliance
- [Section 3.2](#): Historical Compliance
- [Section 3.3](#): Compliance per District
- [Section 3.4](#): Compliance per County
- [Section 3.5](#): Compliance per Day of Week
- [Section 3.6](#): Compliance per Time of Day
- [Section 3.7](#): Compliance per Road Class
- [Section 3.8](#): Compliance per Vehicle Type
- [Section 3.9](#): Compliance per Gender
- [Section 3.10](#): Compliance per Age
- [Section 3.11](#): Compliance per Race
- [Section 3.12](#): Compliance per Demographics
- [Section 3.13](#): Cell Phone Usage

There are a few key terms that the research team would like to define that will be used throughout this chapter. These key terms include:

- [Compliance](#): Compliance refers to the percentage of observable occupants that were wearing a seat belt.
- [Standard Error](#): The standard error refers to the standard deviation of the compliance rate. A 95-percent confidence interval for each compliance rate can be determined by adding (subtracting) 1.96 times the standard error to (from) the compliance rate.
- [Count](#): The count refers to the total number of observable occupants that data was collected on.

The following sections include more information regarding the results of this year's study.

3.1 Statewide Compliance

The “*Observational Survey of Seat Belt Use in Ohio – 2023*” collected a total of 46,799 occupant observations. This number is broken down further to include 40,680 drivers and 6,119 passengers. The reported pre-intervention results include 22,095 observations comprising 19,324 drivers and 2,771 passengers. The reported post-intervention results include 24,704 observations comprising 21,356 drivers and 3,348 passengers. There were a total of 116 drivers and passengers who had unknown belt use in the post intervention survey. A total of 344 sites across all 88 counties were included. Figure 3 shows the statewide compliance results for Ohio in 2023.

Survey	Compliance (%)	Standard Error (%)	Count
Baseline	80.36%	0.0053	22,095
Post-Intervention	84.75%	0.0035	24,704
Difference	4.4		

Note: Reported numbers are weighted.

Figure 3: Statewide Compliance Rate

As seen in Figure 3, Ohio observed a statewide compliance rate of 84.75%. Additionally, the CIOT campaign showed a positive impact on statewide compliance amounting as evidenced by a 4.4% increase. The statewide results were weighted using the methodology described in Chapter II of this report. The statewide compliance results include all observations, except for the 116 unknown observations, that were made during the post-intervention survey.

The data presented in the statewide compliance rate is the only data for the remainder of this report that includes the baseline (pre-CIOT) data. All data reported after this point are that of the post-intervention survey (post-CIOT). Additionally, only the statewide and historical compliance results are weighted, all other reported numbers are unweighted.

3.2 Historical Compliance

In previous studies, Ohio has traditionally trailed behind the national average compliance rate. Since 2000, Ohio has averaged a compliance rate that is 4.2% lower than the national average. The 2023 compliance rate in Ohio (84.75%) is 6.85% lower than the national average (91.6%) in 2022 (the most recent year for which national data are available). There was no official compliance number in 2020 for the state of Ohio. Figure 4 shows the comparison between the Ohio and national compliance rates.

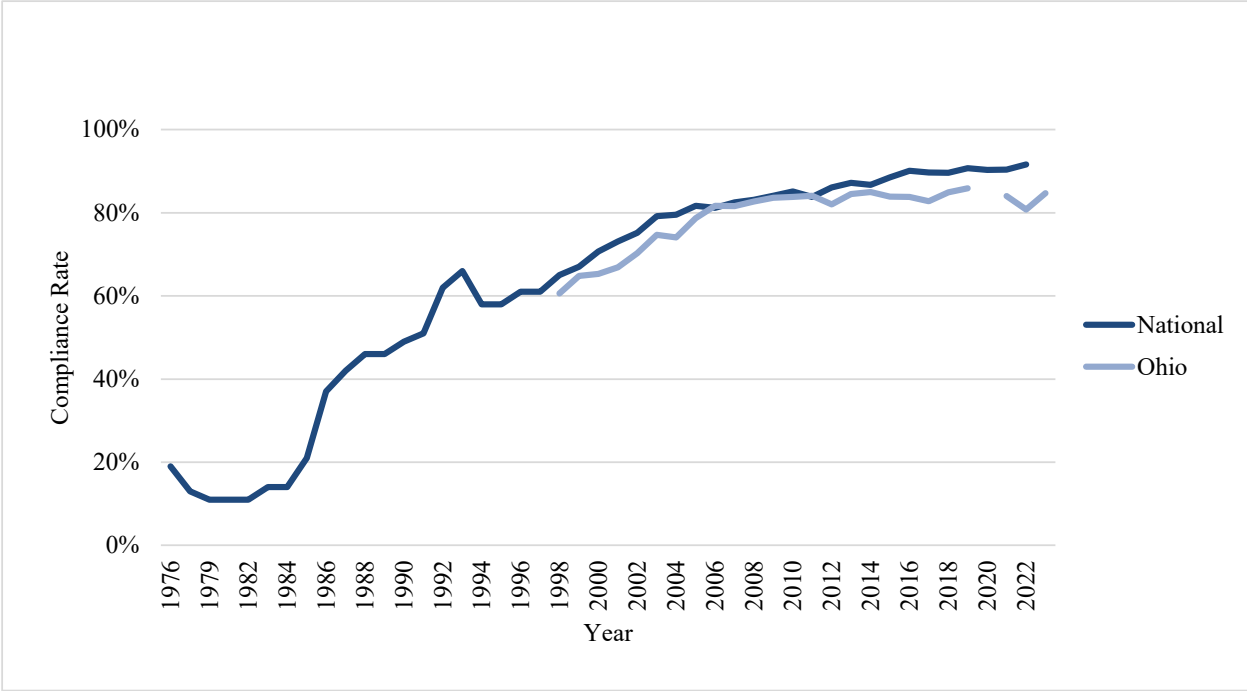
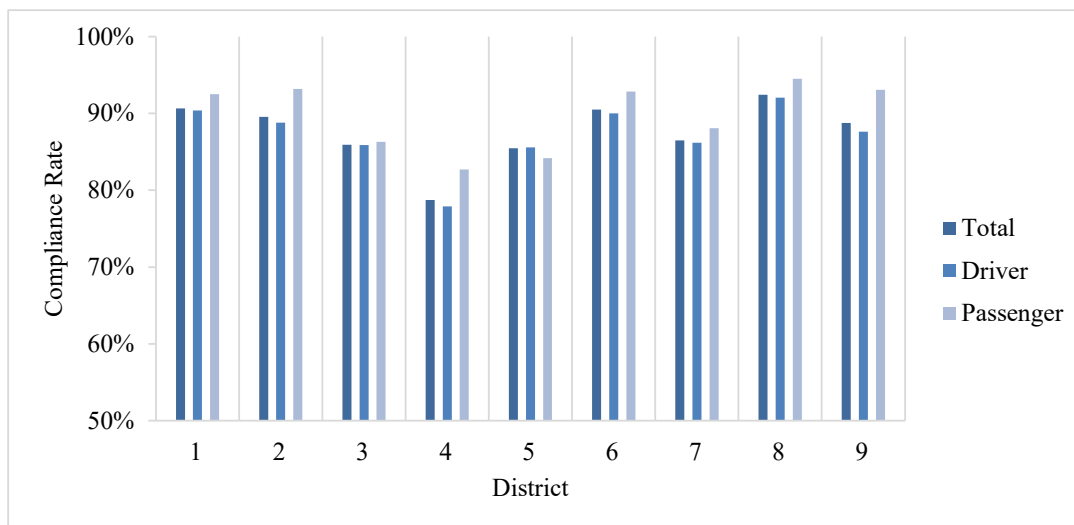


Figure 4: Historical Compliance Rate

While national data for 2023 has not been released at the time of this report, data from 1976 through 2022 was included. Data from Ohio from 1998 through 2023 has also been included. For the past decade, the compliance rate in Ohio has varied between 81% and 86.0%. The 84.75% result from 2023 is consistent with the range of previous year’s studies.

3.3 Compliance per District

The observations were grouped into each of the nine OSHP districts in which they were located. This allowed for the data to be viewed on a broad level to determine if certain geographical regions presented low or high compliance. District 4, with a 78.7 % compliance rate was the lowest and all other districts had a non-weighted value greater than 85%. District 4 includes the counties of Ashtabula, Columbiana, Geauga, Lake, Mahoning, Portage, and Trumbull. Figure 5 provides a detailed breakdown of the district compliance Rates.



District	Occupant	Compliance	Count
1	All	90.7%	2850
	Driver	90.4%	2477
	Passenger	92.5%	373
2	All	89.6%	2246
	Driver	88.8%	1771
	Passenger	93.2%	368
3	All	85.9%	3329
	Driver	85.9%	3473
	Passenger	86.3%	219
4	All	78.7%	2764
	Driver	77.9%	2321
	Passenger	82.7%	491
5	All	85.5%	2945
	Driver	85.6%	3597
	Passenger	84.2%	329
6	All	90.5%	3261
	Driver	90.0%	2429
	Passenger	92.9%	518
7	All	86.5%	1603
	Driver	86.2%	1564
	Passenger	88.1%	294
8	All	92.4%	2864
	Driver	92.1%	2495
	Passenger	94.5%	438
9	All	88.8%	1506
	Driver	87.6%	1229
	Passenger	93.1%	318

Note: District refers to OSHP, refer to Figure 5 for locations. Reported numbers are unweighted.

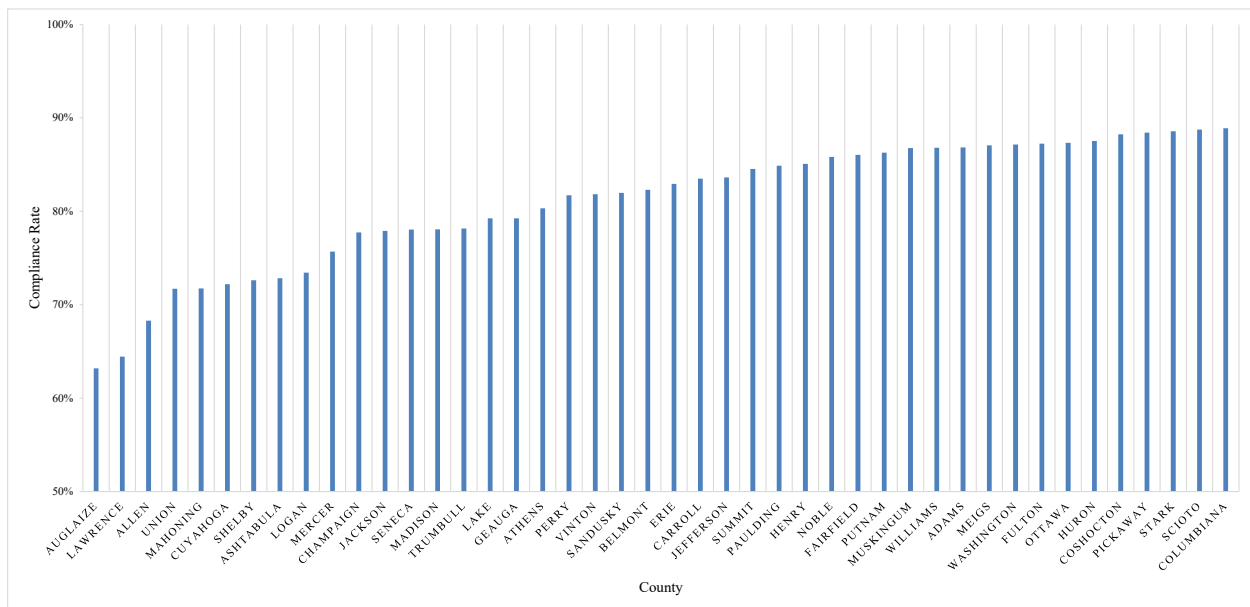
Figure 5: Compliance Rate per District

As seen in Figure 5, Districts 7 and 9, 1603 and 1506 respectively, had significantly fewer observations than the other districts. The greatest number of observations occurred in District 6, 3,261.

3.4 Compliance per County

The observations were further broken down by the county in which they were located. As mentioned previously, this year’s study included all 88 Ohio counties.

As seen in Figures 6 and 7, nine counties had a compliance rate lower than 75%, Auglaize, Lawrence, Allen, Union, Mahoning, Cuyahoga, Shelby, Ashtabula and Logan. Auglaize had the lowest overall compliance at 63.2%. 60 counties had an unweighted compliance rate that is greater than 85%. 35 counties had an unweighted compliance rate that is greater than 90%. Note: 44 of 88 observed counties are presented in Figure 6. The remaining 44 counties are presented in Figure 7. In all cases the reported numbers are unweighted.

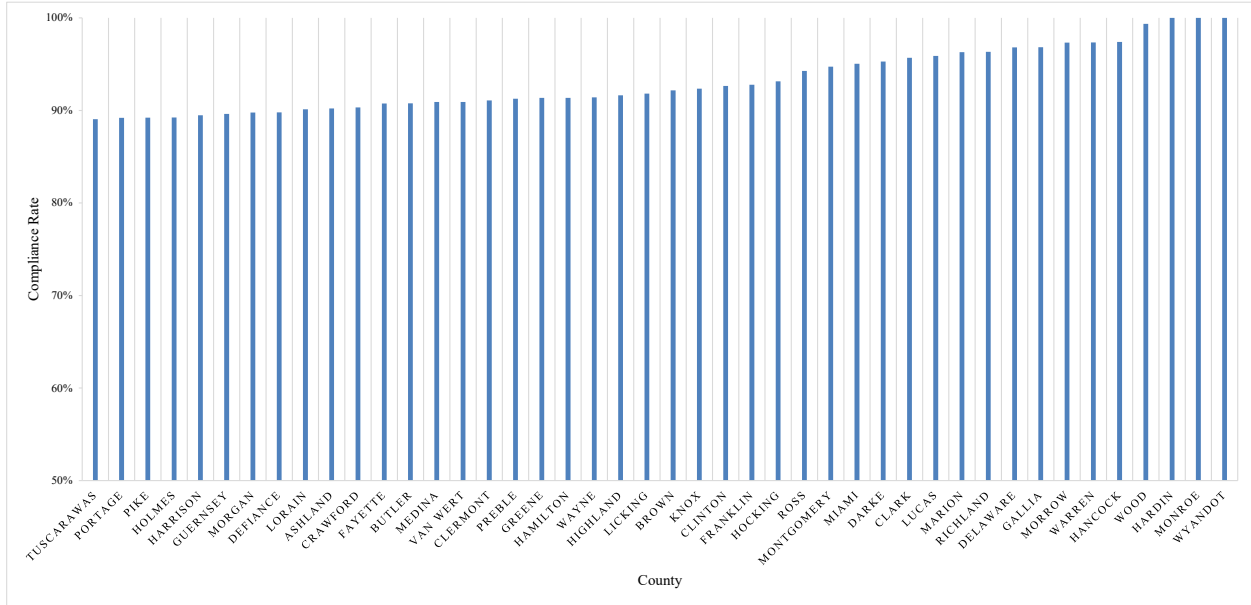


County	Compliance	Count
AUGLAIZE	63.2%	163
LAWRENCE	64.4%	45
ALLEN	68.3%	227

UNION	71.7%	304
MAHONING	71.7%	690
CUYAHOGA	72.2%	669
SHELBY	72.6%	325
ASHTABULA	72.8%	405
LOGAN	73.4%	335
MERCER	75.7%	222
CHAMPAIGN	77.7%	238
JACKSON	77.9%	95
SENECA	78.0%	123
MADISON	78.1%	392
TRUMBULL	78.1%	421
LAKE	79.2%	395
GEAUGA	79.2%	212
ATHENS	80.3%	127
PERRY	81.7%	93
VINTON	81.8%	11
SANDUSKY	82.0%	183
BELMONT	82.3%	209
ERIE	82.9%	205
CARROLL	83.5%	103
JEFFERSON	83.6%	116
SUMMIT	84.5%	608
PAULDING	84.9%	119
HENRY	85.1%	248
NOBLE	85.8%	134
FAIRFIELD	86.0%	351
PUTNAM	86.3%	153
MUSKINGUM	86.8%	378
WILLIAMS	86.8%	144
ADAMS	86.8%	38
MEIGS	87.1%	85
WASHINGTON	87.1%	529
FULTON	87.2%	243
OTTAWA	87.3%	284
HURON	87.5%	345
COSHOCTON	88.2%	34
PICKAWAY	88.4%	233
STARK	88.6%	437
SCIOTO	88.8%	240
COLUMBIANA	88.9%	180

Figure 6: Compliance Rate per County (Auglaize – Columbiana)

Figure 7 shown below is the second part of the statewide county compliance. Figure 7 shows the counties that are in the top half of the state.



County	Compliance	Count
TUSCARAWAS	89.1%	128
PORTAGE	89.2%	509
PIKE	89.2%	232
HOLMES	89.2%	279
HARRISON	89.5%	38
GUERNSEY	89.6%	183
MORGAN	89.8%	137
DEFIANCE	89.8%	186
LORAIN	90.1%	729
ASHLAND	90.2%	184
CRAWFORD	90.3%	248
FAYETTE	90.7%	216
BUTLER	90.8%	585
MEDINA	90.9%	495
VAN WERT	90.9%	110
CLERMONT	91.1%	314
PREBLE	91.3%	275
GREENE	91.4%	382
HAMILTON	91.4%	579

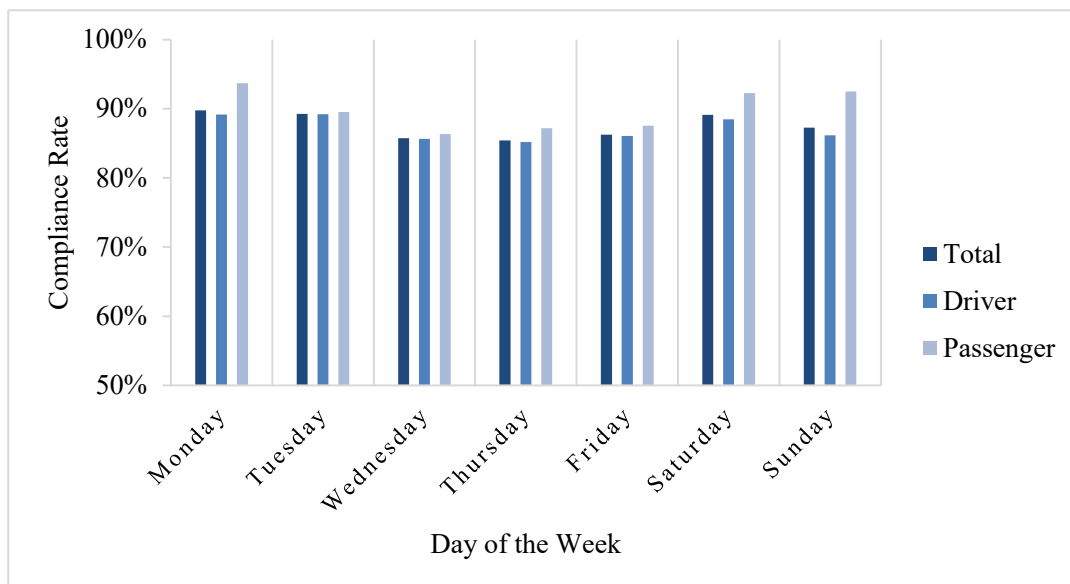
WAYNE	91.4%	291
HIGHLAND	91.6%	215
LICKING	91.8%	281
BROWN	92.2%	217
KNOX	92.3%	209
CLINTON	92.6%	204
FRANKLIN	92.8%	499
HOCKING	93.2%	146
ROSS	94.3%	366
MONTGOMERY	94.7%	854
MIAMI	95.0%	242
DARKE	95.3%	191
CLARK	95.7%	395
LUCAS	95.9%	656
MARION	96.3%	189
RICHLAND	96.3%	491
DELAWARE	96.8%	440
GALLIA	96.8%	63
MORROW	97.3%	449
WARREN	97.3%	565
HANCOCK	97.4%	385
WOOD	99.4%	310
HARDIN	100.0%	69
MONROE	100.0%	6
WYANDOT	100.0%	71

Figure 7: Compliance Rate per County (Tuscarwas – Wyandot)

As seen in Figures 6 and 7, county sample sizes ranged from 6 to 854 observations. On average, each county accounted for approximately 280 observations. Counties with higher populations and larger number of crashes had more observations than rural counties.

3.5 Compliance per Day of Week

The compliance rate was also calculated by day of week to determine if there was any difference based on day, weekday, or weekend. The study was conducted every day of the week. The results of the compliance rate per day of week may be found in Figure 8.



Day	Occupant	Compliance	Count
Monday	All	89.7%	3491
	Driver	89.1%	3030
	Passenger	93.7%	461
Tuesday	All	89.2%	2585
	Driver	89.2%	2222
	Passenger	89.5%	363
Wednesday	All	85.7%	3756
	Driver	85.6%	3331
	Passenger	86.4%	425
Thursday	All	85.4%	4840
	Driver	85.2%	4286
	Passenger	87.2%	554
Friday	All	86.2%	3880
	Driver	86.0%	3390
	Passenger	87.6%	490
Saturday	All	89.1%	4856
	Driver	88.5%	4027
	Passenger	92.3%	829
Sunday	All	87.3%	1296
	Driver	86.2%	1070
	Passenger	92.5%	226

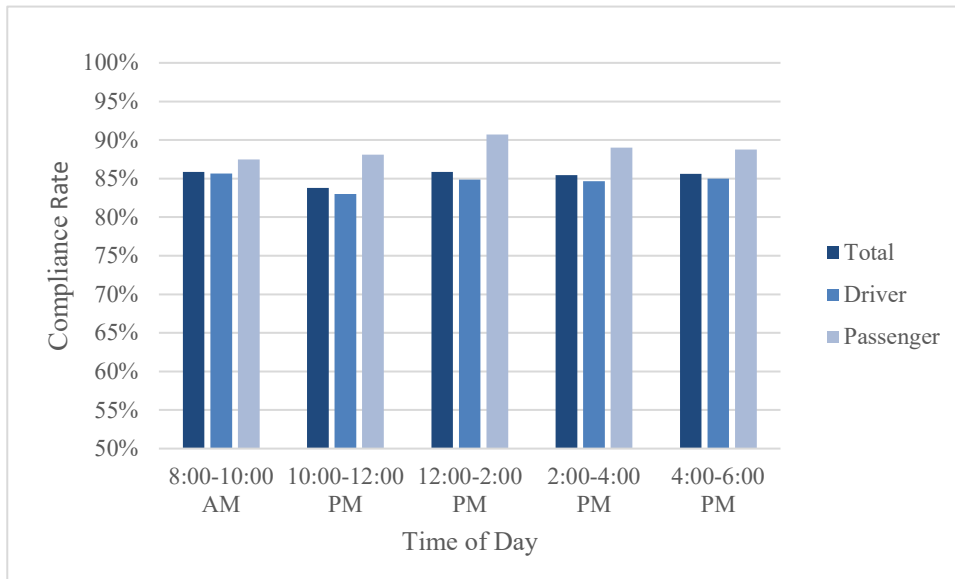
Note: Reported numbers are unweighted.

Figure 8: Compliance Rate per Day of Week

As seen in Figure 8, the day of week does not have a significant impact on the compliance. The day with the highest compliance, Monday, 89.7%, was 4.3% higher than that of the lowest, Thursday, 85.4%. The number of observations ranged from a low of 1,296 on Sunday to a high of 4,856 on a Saturday.

3.6 Compliance per Time of Day

The compliance rate per time of day was considered to conclude if peak travel times had an impact on the compliance rate. The study was conducted from 8:00 AM to 6:00 PM with 6:00 PM being that last time observations would begin. The results of the compliance rate per time of day may be found in Figure 9.



Time	Occupant	Compliance	Count
8:00-10:00 AM	All	85.9%	3403
	Driver	85.6%	2996
	Passenger	87.5%	407
10:00-12:00 PM	All	83.8%	4380
	Driver	83.0%	3565
	Passenger	88.1%	815
12:00-2:00 PM	All	85.9%	4844
	Driver	84.9%	3898
	Passenger	90.7%	946
2:00-4:00 PM	All	85.4%	3198
	Driver	84.7%	2619
	Passenger	89.0%	579
4:00-6:00 PM	All	85.6%	3198

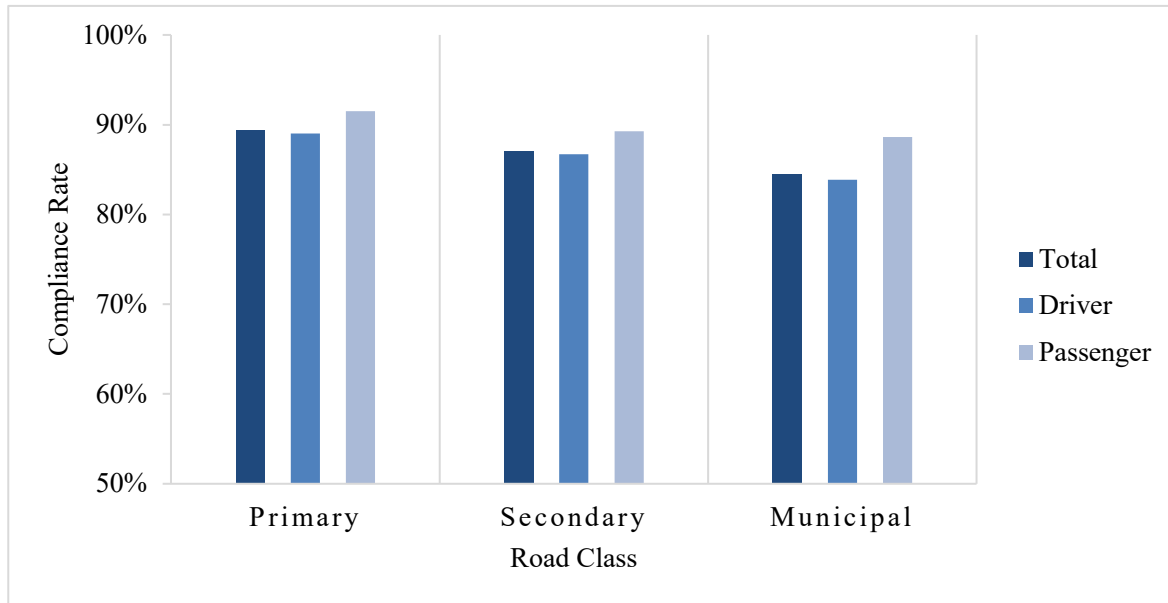
Driver	85.0%	2619
Passenger	88.8%	579

Figure 9: Compliance Rate per Time of Day

As seen in Figure 9, the time of day that the observations were made had little to no impact on the compliance rate of the vehicle occupants.

3.7 Compliance per Road Class

The compliance rate per road class was determined to see if there was any correlation between type of road and seat belt use. There are three types of road classes based on MAF/TIGER Feature Class Code Definitions (MTFCC), primary, secondary, and local. Figure 10 shows the results of the compliance rate per road class.



Road Type	Occupant	Compliance	Sample Size
Primary	All	89.4%	7076
	Driver	89.0%	6300
	Passenger	91.5%	1074
Secondary	All	87.1%	10948
	Driver	86.7%	9494
	Passenger	89.3%	1799
Municipal	All	84.5%	3332
	Driver	83.9%	2795
	Passenger	88.6%	475

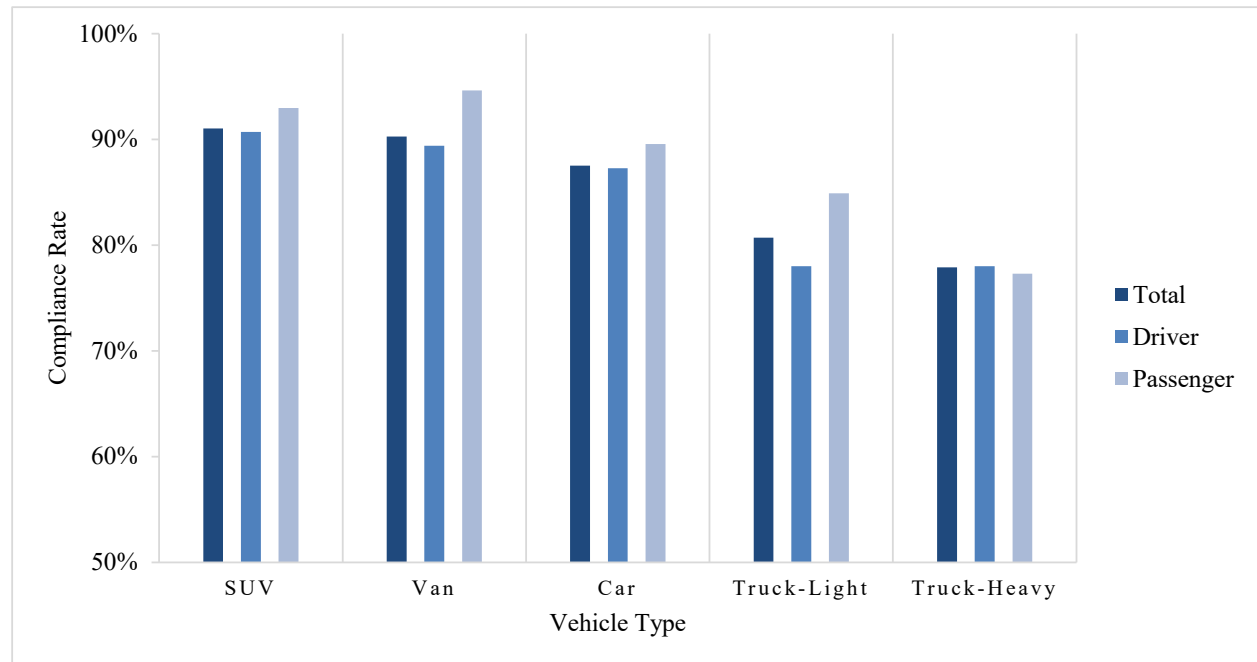
Note: Road classifications were procured using the MAF/TIGER Feature Class Code Definitions. Reported numbers are unweighted. Reported numbers are unweighted.

Figure 10: Compliance Rate per Road Class

As seen in Figure 10, local roads had the lowest compliance rate of any road class at a total of 84.5%. Next, secondary roads, which consist mainly of state and local highways, were observed to have a compliance rate of 87.1%. Finally, primary roads, which consist mainly of interstate and limited access highways had the highest compliance rates at 89.4%.

3.8 Compliance per Vehicle Type

The compliance rate per vehicle type was observed to identify if the type of vehicle had an impact on the occupant compliance rate. There were five types of vehicles observed: SUV, Van, Car, Truck-Light and Truck-Heavy. More information on the types of vehicles observed may be found in Chapter II of this report. The results of the compliance rate per vehicle type may be found in Figure 11.



Vehicle Type	Occupant	Compliance	Sample Size
SUV	All	91.0%	9686
	Driver	90.7%	8247
	Passenger	93.0%	1439
Van	All	90.3%	2003
	Driver	89.4%	1668
	Passenger	94.6%	335
Car	All	87.5%	7851

	Driver	87.3%	6932
	Passenger	89.6%	919
Truck-Light	All	80.7%	2783
	Driver	78.0%	2445
	Passenger	84.9%	338
Truck-Heavy	All	77.9%	2381
	Driver	78.0%	2064
	Passenger	77.3%	317

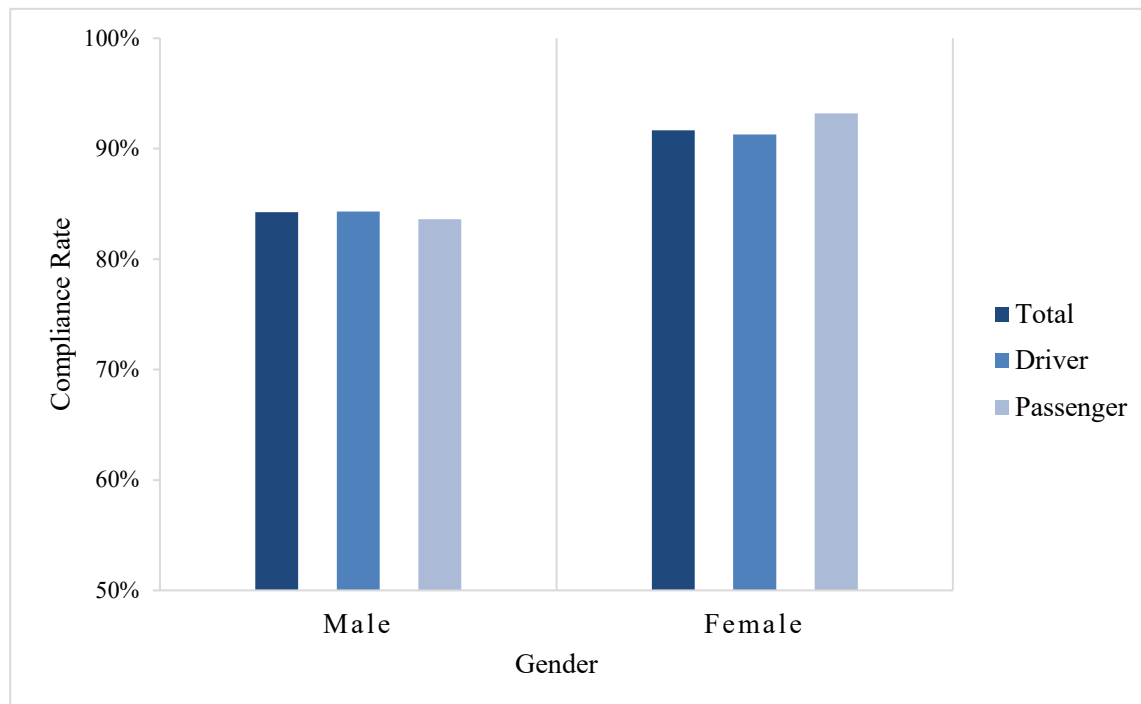
Note: Vehicle information was obtained from the U.S. Department of Energy and Federal Highway Administration. Reported numbers are unweighted.

Figure 11: Compliance Rate per Vehicle Type

As seen in Figure 11, both types of trucks had the lowest compliance rates seen with truck-heavy at 77.9% and truck-light at 80.7%. Next, cars had a compliance rate of 87.5% cars, vans at 90.3%. and the most compliant vehicle type observed was the SUV at 91.0%.

3.9 Compliance per Gender

The compliance rate per gender was obtained to determine if there was a difference in compliance between male and female occupants. Figure 12 shows the results of the compliance rate per gender.



Sex	Occupant	Compliance	Sample Size
-----	----------	------------	-------------

Female	All	91.7%	10568
	Driver	91.3%	8367
	Passenger	93.2%	2201
Male	All	84.3%	14136
	Driver	84.3%	12989
	Passenger	83.6%	1147

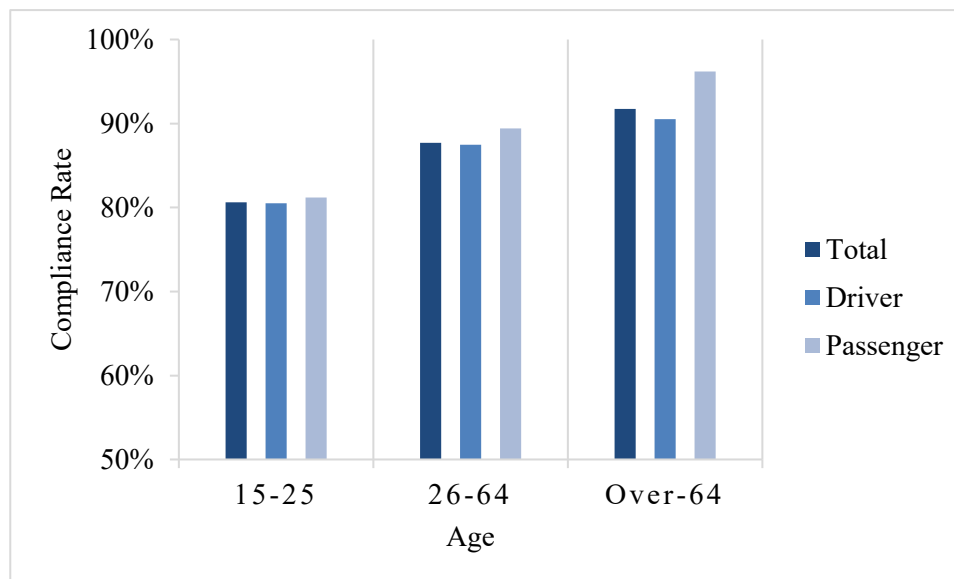
Note: Reported numbers are unweighted.

Figure 12: Compliance Rate per Gender

As seen in Figure 12, the compliance of female occupants is significantly higher than that of males. Female occupants had a compliance rate of 91.7% while males were over 7.4% less compliant at 84.3%. In addition, it was seen that there were more male than female drivers while there were more female than male passengers.

3.10 Compliance per Age

The compliance rate per age was considered to understand if there is a relationship between occupant age and compliance. Drivers were divided into three age categories: 15-25 years, 26-64 years, and over-64 years of age. Additionally, passengers had two additional age groups: 0-4 years and 5-14 years of age. Figure 13 displays the results of the compliance rate per age group.



Age	Occupant	Compliance	Sample Size
0-4	All	50.0%	2
	Driver	N/A	0
	Passenger	50.0%	2

5-14	All	92.8%	278
	Driver	N/A	0
	Passenger	92.8%	278
15-25	All	80.6%	3194
	Driver	80.5%	2641
	Passenger	81.2%	553
26-64	All	87.7%	17518
	Driver	87.5%	15788
	Passenger	89.4%	1730
Over-64	All	91.7%	3712
	Driver	90.5%	2927
	Passenger	96.2%	785

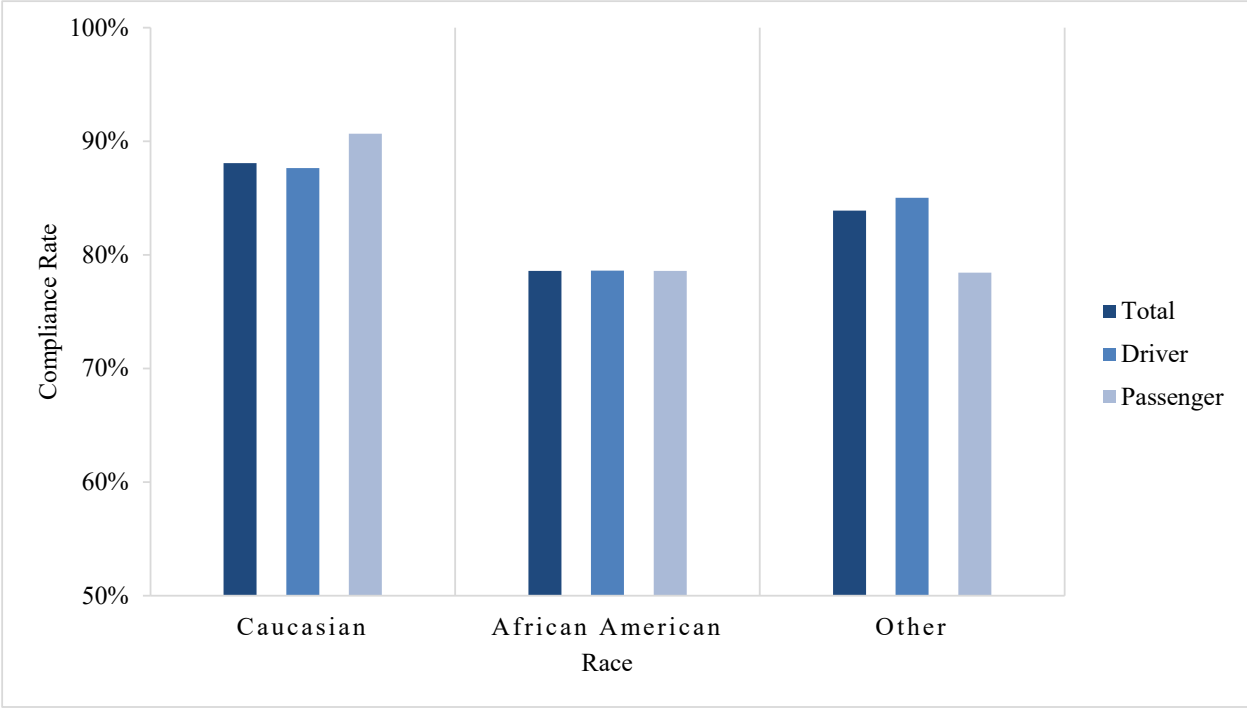
Note: Passengers younger than the age of 15 were omitted from the graph. Reported numbers are unweighted.

Figure 13: Compliance Rate per Age

As seen in Figure 13, younger occupants had a much lower compliance rate than that of middle-aged and older occupants. Occupants aged 15-25 years had the lowest compliance rate at 80.6%. Occupants aged 26-64 years had a compliance rate of 87.7% and those aged over-64 of 91.7%. Note that occupants under the age of 15 had the highest compliance rate but smallest sample size and may not have control of whether they are belted or not.

3.11 Compliance per Race

The compliance rate per race was observed to see if there was a difference in compliance between races. Occupant race was broken into three categories: Caucasian, African American and Other. The results of the compliance rate per race may be found in Figure 14.



Race	Occupant	Compliance	Sample Size
Caucasian	All	88.1%	22865
	Driver	87.7%	19730
	Passenger	90.7%	3135
African American	All	78.6%	1541
	Driver	78.6%	1379
	Passenger	78.6%	162
Other	All	83.9%	298
	Driver	85.0%	247
	Passenger	78.4%	51

Note: Reported numbers are unweighted

Figure 14: Compliance Rate per Race

As seen in Figure 14, Caucasian compliance was 88.1%, Other was 83.9%, while African American occupants was the lowest at 78.6%.

3.12 Compliance per Demographics

The compliance rate per demographic characteristics for drivers was compiled into a single table to determine which subgroups were most at risk of being noncompliant. To keep the sample sizes large enough to be statistically relevant only three demographic factors were looked at: gender, age and vehicle type. Table 2 shows the results of at-risk subgroups.

Table 2: Compliance Rate per Demographics

Driver Sample Distribution				
Driver Gender	Driver Age	Vehicle	Count	Compliance
Male	15-25	Car	653	77.3%
		SUV	251	82.5%
		Truck-Heavy	91	62.6%
		Truck-Light	182	62.6%
		Van	50	86.0%
	26-64	Car	2721	85.9%
		SUV	3039	88.7%
		Truck-Heavy	1583	78.3%
		Truck-Light	1703	81.2%
		Van	778	85.0%
	Over-64	Car	611	90.0%
		SUV	632	92.9%
		Truck-Heavy	244	80.3%
		Truck-Light	313	78.9%
		Van	138	93.5%
Female	15-25	Car	699	83.8%
		SUV	614	86.6%
		Truck-Heavy	11	63.6%
		Truck-Light	35	77.1%
		Van	55	87.3%
	26-64	Car	1868	91.5%
		SUV	3215	92.8%
		Truck-Heavy	122	80.3%
		Truck-Light	187	89.3%
		Van	572	93.9%
	Over-64	Car	380	95.0%
		SUV	496	95.4%
		Truck-Heavy	13	92.3%
		Truck-Light	25	88.0%
		Van	75	97.3%

As seen in Table 2, the subgroups that are most at-risk of being noncompliant include most occupants of trucks, especially young males. Additionally, young males in cars also were observed to have a low compliance rate. Higher compliance rates are found with females older than 25 driving SUVs and Cars. Note that some sample sizes are too small to have statistical relevance, such as young females driving Vans.

3.13 Cell Phone Usage

In addition to observing seat belt compliance, data regarding cell phone usage was also collected. An overall statewide estimate of phone use by drivers was determined. Observers were instructed to consider drivers to be using a cell phone if they could clearly be seen talking on it. Table 3 presents the statewide phone usage.

Table 3: Statewide Phone Usage

Phone Use	Sample Size
3.6%	21,356

Note: Phone usage applies only to drivers. Reported number is unweighted.

As seen in Table 3, Ohio had a statewide driver phone use rate of 3.6%. In addition to the statewide phone use, the compliance rate per phone usage was also determined to see if phone users were likely to wear a seat belt. Table 4 shows the compliance rate per phone usage.

Table 4: Compliance Rate per Phone Usage

Phone	Baseline		Post-Intervention	
	Compliance	Sample Size	Compliance	Sample Size
No	85.3%	15841	87.2%	17956
Yes	83.3%	632	82.4%	633

As seen in Table 4, the baseline study saw almost no difference in the compliance rate between phone users and non-phone users. However, in the post-intervention survey, there was a 2.0% increase in compliance for drivers who did not use a phone. Additional investigation is necessary to better understand the relationship between cell phone usage and seat belt compliance.

CHAPTER IV – RECOMMENDATIONS & CONCLUSIONS

The “*Observational Survey of Seat Belt Use in Ohio – 2023*” study provides important insights as to seat belt use among Ohioans. As shown in Chapter III, the CIOT campaign and enforcement successfully increased seat belt usage throughout the state. The compliance rate rose from 80.4% to 84.8% for a net increase of 4.4%. The team notes a few trends that were observed in this year’s study.

- Local roads have a lower compliance rate compared to primary and secondary roads,
- Heavy and light trucks have a lower compliance rate compared to any other vehicle type,
- Male occupants have a lower compliance rate compared to female occupants,
- Young occupants have a lower compliance rate compared to older occupants, and
- Subgroup of young males in trucks, heavy trucks, showed the lowest compliance rates of all demographic subgroups with an adequate sample size.

When compared to previous studies conducted in Ohio, the conclusions of this year’s study are very similar to what has been seen historically throughout the state.

4.1 Recommendations

This year’s study provided some additional insights that may be helpful for NHTSA and DPS to recognize as key areas for improvement. These recommendations mirror the trends that were observed in the previous section:

4.1.1 Local Roads

Local roads had by far the lowest rate of compliance in the state. When compared to secondary, 87.1%, and primary, 89.4%, roads, local roads, 84.5%, had on average a 3.75% lower compliance rate.

4.1.2 Heavy & Light Trucks

As is consistent with previous studies, heavy trucks, 77.9%, and light trucks, 80.7%, have a significantly lower compliance rate than each; cars, 87.5%, vans, 90.3%, and SUV’s, 91.0%. As mentioned in the preceding point, trucks typically are seen in greater numbers on local roads compared to secondary and primary roads. These two groups combine to create a situation that limits the ability to raise the compliance rate for either group significantly.

4.1.3 Male Occupants

When compared to female occupants, 91.7%, male occupants, 84.3%, have historically had a lower compliance rate. Again, as seen in how trucks and local roads combine to depress compliance, so does the

male occupants and truck groups. Truck occupants are typically male, see Table 2, which creates another grouping that limits the ability to raise the compliance rate.

4.1.2 Young Occupants

Traditionally, young occupants, 80.6%, have a lower compliance rate than both mid-age, 87.7%, and older, 91.7%, occupants. The 2023 study is consistent with previous studies. The young occupants are a prime target for campaigns that attempt to increase seat belt compliance since they may be reached in large numbers during driving training and school.

4.2 Conclusions

Using the information contained in this report, especially the recommendations, both NHTSA and DPS may develop new techniques to increase the seat belt compliance rate in Ohio and nationwide. The use of both enforcement and media campaigns is crucial to maintain the success that Ohio has had and further increase the statewide compliance rate. Each occupant that NHTSA and DPS may reach and convince to wear a seat belt has the potential to save a life. Increasing seat belt compliance is one of the easiest ways to decrease the number of annual fatalities that occur on Ohio roads. To that end, the results and recommendations from this study play an important role in helping to achieve this shared goal.

PAGE NUMBER:
SITE NUMBER:

SITE SURVEY FORM

VEHICLE	CAR VAN SUV TRUCK-LIGHT TRUCK-HEAVY	CAR VAN SUV TRUCK-LIGHT TRUCK-HEAVY	CAR VAN SUV TRUCK-LIGHT TRUCK-HEAVY	CAR VAN SUV TRUCK-LIGHT TRUCK-HEAVY	CAR VAN SUV TRUCK-LIGHT TRUCK-HEAVY
DRIVER BELT	YES NO UNKNOWN	YES NO UNKNOWN	YES NO UNKNOWN	YES NO UNKNOWN	YES NO UNKNOWN
DRIVER SEX	MALE FEMALE	MALE FEMALE	MALE FEMALE	MALE FEMALE	MALE FEMALE
DRIVER AGE	15-25 26-64 OVER-64	15-25 26-64 OVER-64	15-25 26-64 OVER-64	15-25 26-64 OVER-64	15-25 26-64 OVER-64
DRIVER RACE	CAUCASIAN AFRICAN-AMERICAN OTHER.	CAUCASIAN AFRICAN-AMERICAN OTHER	CAUCASIAN AFRICAN-AMERICAN OTHER	CAUCASIAN AFRICAN-AMERICAN OTHER	CAUCASIAN AFRICAN-AMERICAN OTHER
DRIVER PHONE	YES NO	YES NO	YES NO	YES NO	YES NO
PASSENGER BELT	YES NO UNKNOWN NO-PASSENGER	YES NO UNKNOWN NO-PASSENGER	YES NO UNKNOWN NO-PASSENGER	YES NO UNKNOWN NO-PASSENGER	YES NO UNKNOWN NO-PASSENGER
PASSENGER SEX	MALE FEMALE	MALE FEMALE	MALE FEMALE	MALE FEMALE	MALE FEMALE
PASSENGER AGE	0-4 5-14 15-25 26-64 OVER-64	0-4 5-14 15-25 26-64 OVER-64	0-4 5-14 15-25 26-64 OVER-64	0-4 5-14 15-25 26-64 OVER-64	0-4 5-14 15-25 26-64 OVER-64
PASSENGER RACE	CAUCASIAN AFRICAN-AMERICAN OTHER	CAUCASIAN AFRICAN-AMERICAN OTHER	CAUCASIAN AFRICAN-AMERICAN OTHER	CAUCASIAN AFRICAN-AMERICAN OTHER	CAUCASIAN AFRICAN-AMERICAN OTHER

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OHIO DEPARTMENT OF PUBLIC SAFETY

Figure 16: Site Survey Form

Appendix B Site List

Table 5: 2023 Site List

Site Num	District	Primary Site	Cross Street	Latitude	Longitude
1	8	State Route 781	Jacksonville Road	38.90806	-83.440409
2	8	State Route 348	Lester Abbott Lane	38.8316	-83.333094
3	8	Paul Copas Road	State Route 247	38.88233	-83.560839
4	1	I-75	Napoleon Road	40.82637	-83.975771
5	1	St Johns Road	E Hanthorn Road	40.70222	-84.089813
6	1	US Highway 30	Ottawa Road/State Route 65	40.82278	-84.094836
7	1	Leatherwood Road	US-30	40.83794	-84.230954
8	4	I-71	US-250	40.85724	-82.255545
9	4	SR 603	US30	40.78106	-82.377082
10	4	County Road 175	US-250/Front Street	40.85841	-82.152953
11	4	State Route 11 Exit 98	East 21st Street	41.88878	-80.781968
12	4	State Route 11 Exit 78	US-6	41.60676	-80.711655
13	4	US-322/E Main Street	Staley Road	41.5352	-80.843699
14	4	West Prospect Road (20)	Station Ave	41.86871	-80.786607
15	4	E Windsor Road/County Highway 6	SR 46	41.55741	-80.770203
16	4	Creek Road	Marcy Road	41.75247	-80.563708
17	9	US Highway 33	Happy Hollow Road/County Road 78	39.44423	-82.204688
18	9	US 50	Washington Road/Meadowbrook Road	39.236	-82.194415
19	9	Old State Rte	SR 56	39.32729	-82.204519
20	5	US Route 33	Willipie St.	40.55437	-84.193341
21	5	E Spring St (29)	N Spruce Road	40.5449	-84.383904
22	7	Ohio River Secnic Byway	W 26th Street/E 26th Street	40.00998	-80.743062
23	7	Somerton Highway/800	Flat Rock Road	39.93414	-81.156788
24	7	Glencoe Stewartsville Road/ State Ro	Tar Run Road/Township Highway 723	40.00258	-80.877185
25	7	Colerain Pike	Ohio Ave	40.11529	-80.794147
26	8	State Route 756	State Route 505/State Route 756	38.86729	-84.012183
27	8	Appalachian Highway	US-62	38.96709	-83.726962
28	8	Lake Grant Road	Oakland-Locust Ridge Road/County Hig	38.99452	-83.934059
29	8	Beacon Hill Dr	US Rte 68	39.02082	-83.919601
30	8	I-75 Exit 24	Liberty Way	39.36944	-84.367333
31	8	I-75 Exit 21	Cincinnati Dayton Road	39.34276	-84.395876
32	8	State Route 122/Roosevelt Blvd	S Breiel Blvd	39.49952	-84.355469
33	8	Butler County Veterans Highway Exit	State Route 4	39.385	-84.506493
34	8	Hayes Ave	River Road	39.36295	-84.562147
35	8	Civic Centre	Uninon Center	39.3203	-84.420799
36	7	E Canal St	N Reed Ave	40.6917	-81.180805
37	7	Bay Rd SE	Carnation Rd SE	40.5262	-80.93439
38	5	US Highway 68	W County Line Road	40.02738	-83.80773
39	5	E Bennet St	South Main St	40.173302	-83.513901
40	5	SR 296	US 68	40.15534	-83.745847
41	5	Black Road	State Route 296	40.18141	-83.636933
42	5	I-70 Exit 38	Brandt Pike/State Route 201	39.86816	-84.0999886
43	5	I-70 Exit 48	Enon Road	39.88881	-83.9356800
44	5	West Sparrow	SR 72	39.85191	-83.8150440
45	5	State Route 571/N Medway Rd	W National Rd	39.91131	-84.0094830

46	5	Olive Street	E Cassilly Street	39.93486	-83.8001760
47	5	Bischoff Road	New Carlisle Pike	39.94181	-83.9789520
48	8	I-275	State Route 28	39.18715	-84.261574
49	8	State Route 132	Chapel Road	39.03526	-84.197252
50	8	State Route 222	State Route 222/Mt Olive Point Isabel R	38.89595	-84.127583
51	8	Lindal Nicholasville	Lindale-Mt Holly	38.99056	-84.207613
52	8	Bartlow Road/Center Street	US-52/Ohio River Scenic Byway	38.77616	-84.057268
53	8	State Route 73	US Route 68	39.46412	-83.836633
54	8	State Route 73	Mitchell Road	39.46371	-83.869294
55	8	State Route 133	Rhude Road/James Road/Township Hig	39.32934	-83.96916
56	8	Shawnee T	SR 123	39.26843	-83.970565
57	4	US Highway 30	OH 267	40.6821	-80.6362620
58	4	Salem Alliance Rd US 62	SR 45	40.90098	-80.8812560
59	7	State Route 60	County Road 82	40.3258	-82.014357
60	7	State Route 715	County Road 20	40.35549	-82.10676
61	7	Wakatomica Road	State Route 229	40.33575	-82.190803
62	2	US Hwy 30	Old Lincoln Highway	40.81248	-82.932076
63	2	Harding Way	N East Street	40.73367	-82.778163
64	10	I-77 Exit 159B	Independence Road	41.45724	-81.657725
65	10	I-77 Exit 155	Rockside Road	41.39711	-81.653687
66	10	Shaker Blvd/State Route 87	Lee Road	41.48095	-81.565193
67	10	State Route/Northfield Rd	Emery Road	41.43534	-81.526516
68	10	Lomond Blvd	Stoer Rd	41.46203	-81.544596
69	10	Industrial Parkway/East Parkway	W 150th Street	41.42536	-81.801221
70	5	State Route 47	US-127	40.22376	-84.575683
71	5	Union City Road/State Route 571	Coletown-Lightsville Road/County High	40.14366	-84.708063
72	5	Willowdell Road/County Highway 102	Footo Road	40.3065	-84.453714
73	5	Greenville-Pallescine Road	County Highway 57	40.07758	-84.693274
74	1	US Hwy 24	Baltimore Street	41.27525	-84.411771
75	1	Ottawa Ave	Logan Street	41.27188	-84.349466
76	6	Sawmill Parkway	US-42	40.27179	-83.106637
77	6	US Highway 23	State Route 229/Norton Road	40.43381	-83.072211
78	6	S Galena Road/County Road 34	Cheshire Road/County Road 72 and Ro	40.24653	-82.910329
79	6	Hickory Rock Blvd	Steitz Rd	40.19433	-83.11011
80	6	Dustin Road/Township Highway 104	Rome Corners Road	40.21677	-82.912951
81	2	I-80	State Route 4/Columbus-Sandusky Road	41.34186	-82.758675
82	2	N Washington Street	Main Street	41.40003	-82.808417
83	2	Garfield Rd	SR 60	41.32148	-82.364152
84	6	I-70 Exit 112	Baltimore-Reynoldsburg Road	39.93457	-82.789225
85	6	US-33	Coonpath Road NW	39.77233	-82.690203
86	6	Lancaster Neward Rd	SR 204	39.89989	-82.562605
87	6	Lancaster Strret	Main Street	39.89651	-82.535113
88	6	Purvis Ave	Walnut Stree	39.7038	-82.430715
89	6	Beck Road	Revenge Road	39.62294	-82.619543
90	8	US 35	US 41	39.51386	-83.4434580
91	8	State Route 38	State Route 734	39.6482	-83.4333060
92	8	State Route 41	East High Street	39.65404	-83.5632460
93	8	West Lancaster Road/County Highway	State Route 734	39.65107	-83.6089030
94	6	James L Wagner Memorial Highway	S High Street/US-23	39.91748	-82.995217
95	6	I-270/Jack Nicklaus Freeway Exit 15	Tuttle Crossing Blvd	40.07577	-83.134125
96	6	E Main Street/US 40	Noe Bixby Road	39.95465	-82.851671
97	6	W Dublin Granville Road	Evening Street	40.08898	-83.022276
98	6	North Selby Blvd	Andover St	40.0776	-83.005898
99	6	W Campus Road	New Albany Road	40.10434	-82.815992
100	1	I- 80	Ohio 109	41.59413	-84.044643

101	1	N Main St	Church Street	41.59049	-83.892082
102	1	Co Rd 3	Township Road H	41.58876	-83.921311
103	9	US Hwy 35	Ohio 325	38.89224	-82.382541
104	9	State Rte 14	Waterloo Cemetery Rd	38.70032	-82.462944
105	4	US Highway 422	State Route 306/Chillicothe Road	41.38835	-81.339128
106	4	Old State Road/ State Route 608	US-6/Crand Army of the Republic High	41.6043	-81.146443
107	4	Hayes Road/Township Road 121	Nauvoo Road/ Township Road 123	41.47914	-81.022066
108	8	US-35 Exit 55	N Bickett Road	39.69154	-83.8831310
109	8	US-35 Exit 62	Old US 35	39.66869	-83.7673450
110	8	US-42	W Spring Valley Paintersville Road	39.6109	-84.0010530
111	8	State Route 380	E Kreppds Road	39.63336	-83.9429190
112	8	Vanniman Rd	SR 57	39.55235	-83.6899870
113	8	McPherson Road	Lower Bellbrook Road	39.64538	-83.9921090
114	7	I- 70	State Route 513	40.05316	-81.32522
115	7	E Pike Rd	Sundew Rd	40.03355	-81.491936
116	8	I- 74 Off	New Haven Road	39.26051	-84.797591
117	8	I-74 Exit 17	Montana Ave	39.15855	-84.567016
118	8	Riverside Drive/US-52	Collins Ave	39.12343	-84.46955
119	8	State Route 3/Montgomery Road	Pfeiffer Road/Padabaugh Drive	39.24898	-84.344635
120	8	E Galbraith Road	Blue Ash Road	39.20771	-84.391208
121	8	Burlington Road	Springdale Road	39.26011	-84.556062
122	1	I-75	State Route 613	41.13801	-83.657993
123	1	State Route 235/Mc Comb Road	East Main Street	41.00545	-83.787332
124	1	US Highway 68	US Highway 68	40.98862	-83.650809
125	1	N Blanchard Street	E Main Street	41.03964	-83.641295
126	1	State Rte 292	Township Road 180	40.5959	-83.593723
127	7	Smyrna Rd	Campbell Road	40.19247	-81.247319
128	1	Highway 24	State Route 109	41.42996	-84.008727
129	1	State Route 281	State Route 65	41.28385	-83.940633
130	1	State Route 108	County Road V	41.47153	-84.134147
131	1	Twp Rd S3	County Road 3	41.45092	-83.92195
132	8	US Highway 62/S High Street	Muntz Street	39.19699	-83.612814
133	8	State Rte 124	Main Street	39.15209	-83.485057
134	8	South Baker Road	Hereford Road	39.10642	-83.831572
135	9	US Hwy 33	S Mulberry Street	39.53553	-82.407279
136	9	State Rte 56	Amerine Road	39.39554	-82.551293
137	9	Bremen Rd	State Route 93	39.56535	-82.385589
138	3	State Route 60	Wooster St	40.59662	-82.113429
139	3	State Route 39 (W. Main Street)	Mill Street (93)	40.51116	-81.653354
140	3	TR 82	SR 60	40.46148	-81.965991
141	2	US-20	US-250/State Route 13	41.22166	-82.598406
142	2	Milan Ave/US-250	Gallup Ave	41.25982	-82.611952
143	2	US-20	Monroe Street/Milan Ave	41.24387	-82.694685
144	2	E Townline Road 12	Rome Greenwich Road	41.06648	-82.534436
145	9	US-35	State Route 93	39.07315	-82.627769
146	9	State Route 788	State Route 788/Fairgreens Road	39.07358	-82.601045
147	9	State Route 279	Township Highway 318/McCoy Road	38.88647	-82.687986
148	9	Monroe Chapel Church	State Route 140	38.85993	-82.626395
149	9	Township Highway 242/Pleasant Grov	Jisco West Road/County Road 82	39.04984	-82.664033
150	7	Ohio River S	Cool Spring Road	40.31603	-80.615279

151	7	State Route 152	Walnut Ridge Road	40.42553	-80.780561
152	7	Twp Hwy 102	Union Street	40.17604	-80.805703
153	6	Millersburg Road	SR 226	40.38138	-82.28226
154	6	New Guilford Rd	McLarnan	40.28456	-82.28392
155	6	State Route 205/Danville-Jelloway Rd	Township Highway 327/State Route 205	40.48859	-82.2803
156	6	SR 114	CR 19	40.29466	-82.625496
157	6	Tullos	Morgan Center	40.2997	-82.447304
158	4	I-90	State Route 306/Broadmoor Road	41.6396	-81.373442
159	4	Mentor Ave	Jackson Street/Little Mountain Road	41.67247	-81.327347
160	4	Colburn Road	State Route 44	41.64112	-81.241494
161	9	State Route 775	Bear Creek-Indian Guyan Road	38.48136	-82.390227
162	9	Etna-Waterlo	SR 93	38.62315	-82.658716
163	6	I-70 Exit 132	Jacksontown Road	39.9452	-82.408792
164	6	I-70 Exit 118	State Route 310	39.95016	-82.682571
165	6	State Route 13	County Road 73/County Road 2/County	39.9158	-82.49047
166	6	Pleasant Valley Road	State Route 79/Fallsburg Road	40.20299	-82.236131
167	6	Kaiser Drive	Hebron Road	40.01225	-82.458411
168	6	Downing Rd	Johnstown-Alexandria (37)	40.18111	-82.742408
169	5	US Highway 33	County Road 10	40.34196	-83.692728
170	5	S Main Street/State Route 235	W Lake Street	40.48432	-83.923988
171	5	SR 274	US Rte 33	40.44579	-83.820261
172	5	C-13	County Hwy 32	40.38513	-83.789787
173	5	County Highway 31 S	State Route 508	40.27921	-83.863404
174	3	I-90 Exit 153	Center Road	41.46568	-82.021726
175	3	State Route 10 Exit 3	Alternate State Route 83	41.35172	-82.024716
176	3	State Route 511/State Street/Vermilion	Oberlin-Norwalk Road/US-20/Kipton E	41.2584	-82.302802
177	3	Hwy 57	E Broad Street	41.36407	-82.076029
178	3	Oberlin Ave	W 21th Street	41.45085	-82.185183
179	3	Kansas Ave	Colorado Ave	41.46563	-82.156992
180	1	US-24/Anthony Wayne Trail	Fallen Timbers Lane	41.54146	-83.704317
181	1	I-75 Exit 210	E Alexis Road	41.72107	-83.500494
182	1	Miami Street/State Route 65	Oakdale Ave	41.62358	-83.53182
183	1	Airport Highway/State Route 2	S Crissey Road	41.60747	-83.761322
184	1	Brown Ave	Nebraska Ave	41.6456	-83.587054
185	1	Bowen Road	Grantwood Drive	41.6966	-83.610577
186	6	I-70	NE Plain City-Georgesville Road/State I	39.9799	-83.26125
187	6	SR 142	US 40	39.94452	-83.27386
188	6	SR 29	US 42	39.96653	-83.362547
189	6	Old Xenia Road	Washington-London Road/State Route 3	39.84974	-83.465873
190	4	I-680 Exit 3C	Wellington Ave	41.10745	-80.6852430
191	4	I-680 Exit 11	Boardman Poland Road/US-224	41.02415	-80.6246650
192	4	US-62/Madison Ave Expressway	Albert Street	41.10596	-80.6315790
193	4	State Route 7/Market Street	SR 165	40.94396	-80.6577540
194	4	Saint Andrews Drive	Tyler Drive	41.02835	-80.7203920
195	4	E Boston Ave	Market Street	41.06845	-80.6598150
196	2	US Highway 23	State Route 98	40.46224	-83.076752
197	2	SR 98	SR 195	40.6659	-83.015198
198	2	SR 100	SR 309	40.6704	-82.861
199	2	Larue-Green Camp Road	Guthery Road/Larue-Green Camp Road	40.55819	-83.330327
200	2	Township Highway 142/Gearhiser Ro	State Route 229	40.4345	-83.049946

201	3	I-76 Exit 7	Highway 57	41.03218	-81.760614
202	3	I-71 Exit 218	State Route 18/Medina Road	41.13611	-81.793214
203	3	State Route 18/Medina Road	Windfall Road	41.13636	-81.78508
204	3	Lafayette (421)	Lodi Road	41.02698	-82.030764
205	3	Substation Road/County Highway 38	Grafton Road	41.2608	-81.860741
206	3	Mud Lake Road	Route 3	41.00152	-81.887092
207	9	Appalachian Highway/State Route 32	Old State Route 346/County Highway 5	39.18186	-82.276233
208	9	US Route 33	Peachfork Road/C-19	39.0961	-82.013044
209	9	Brooks Rd	SR 681	39.16801	-81.829319
210	9	County Highway 11/Carpenter Dyesv	Township Highway 405/Harmon Road	39.12794	-82.229846
211	5	US Rte 127	SR 219	40.48348	-84.571369
212	5	State Route 117	US-127	40.7134	-84.580682
213	5	Clune Stuck Road	SR 274	40.43696	-84.512503
214	5	Palmer Road	State Route 707	40.66961	-84.561348
215	5	I-75	W Market Street/State Route 55	40.02573	-84.2292100
216	5	State Route 589	Troy Urbana Road/County Highway 19	40.08322	-84.1170440
217	5	State Route 55	S Range Line Road	39.9952	-84.3709780
218	5	Perry Road	N McMaken Rd	40.14239	-84.3362770
219	7	State Route 260	Merrill Ridge Road	39.58512	-81.214408
220	5	I-75 Exit 75	E National Road/US-40	39.89175	-84.1863190
221	5	I-70 Exit 29	S Main Street	39.85972	-84.2813030
222	5	State Route 48/Far Hills Avenue	E David Road	39.68138	-84.1666180
223	5	Dayton Germantown Pike/State Route	Manning Road	39.65822	-84.3277650
224	5	W Nottingham Road	Philadelphia Drive	39.80772	-84.2349980
225	5	W Stroop Road	N Springboro Pike	39.69738	-84.2186310
226	7	Main St	Smithville Road	39.70711	-81.882146
227	2	I-71	State Route 95	40.49729	-82.718365
228	2	State Route 97	State Route 314/Chesterville-Shelby	40.70542	-82.665574
229	2	State Rte 61	St Rte 229	40.40068	-82.826887
230	2	Cardington East Road	Worthington-New Haven Road/County	40.49631	-82.83773
231	7	I-70 Exit 153A	State Street	39.94831	-82.018052
232	7	State Route 146/Chandlersville Road	Carrie Circle	39.92542	-81.943841
233	7	State Route 60/S River Road	Henderson Street/Water Street	39.80196	-81.892517
234	7	Homestead Drive	E Pike/US-22	39.98984	-81.762917
235	7	Boggs Road/County Highway 108	Sonora Road/County Highway 52	39.9702	-81.904769
236	8	I- 77	State Route 78	39.73814	-81.528447
237	8	Lashley Rd	Churchman Lane	39.90258	-81.350909
238	2	State Route 2	State Route 163	41.51524	-82.907528
239	2	W Harbor Road/State Route 163	State Route 163/N Camp Road	41.5173	-83.020672
240	2	E Bayshore Road/County Road 135	S Danbury Road	41.50319	-82.828981
241	1	US Hwy 24 Webtound Ramp	State Route 127	41.22065	-84.582419
242	1	State Route 613	US 127	41.09162	-84.573513
243	6	State Route 93	State Route 37	39.703	-82.116019
244	6	Township Highway 195	Township Highway 210 NE	39.72154	-82.146007
245	6	I-71 Exit 84	State Route 56/London-Circleville Road	39.759	-83.30459
246	6	SR 316	SR 56	39.67425	-83.180388
247	6	State Route 207	US-22	39.56878	-83.201648
248	6	Ashville Pike	Duvall Rd	39.77168	-82.949419
249	6	Tarlton Road	Main Street/Harrison Street	39.55494	-82.783782
250	9	State Route 32/Appalachian Highway	Laurel Ridge Road/County Road 27	39.04222	-83.165052

251	9	State Route 32/Appalachian Highway	Shyville Road	39.05197	-82.995594
252	9	Hay Hollow Road	Hickson Run Road	39.13922	-82.807327
253	4	I-76	State Route 43	41.10869	-81.3475030
254	4	State Route 59/Haymaker Parkway	Middlebury Road/S Chestnut Street	41.15079	-81.3686870
255	4	Diagonal Road	Ravenna Road	41.18385	-81.3430800
256	5	I-70 Exit 10	US-127	39.83413	-84.629502
257	5	State Route 503	Pyrmont Road	39.80258	-84.534827
258	5	State Route 503//W Elkton Rd	W Elton Gifford Road/Somerville West	39.58229	-84.554449
259	5	Bantas Creek Rd	Eaton Lewisburg Rd	39.77336	-84.617618
260	5	Enterprise Rd	SR 503	39.65652	-84.529516
261	1	US Route 30	Lincoln Highway	40.84689	-84.305399
262	1	State Route 190	Township 24	40.88991	-84.320582
263	2	I-71 Exit 165	State Route 97	40.64921	-82.544628
264	2	Park Ave	S. Home Road	40.75962	-82.57108
265	2	SR 603	SR 113	40.91201	-82.499351
266	2	Divelbiss Road	State Route 95	40.56825	-82.450676
267	2	Cairns Road	Bowman Street	40.8059	-82.539091
268	9	US Highway 35	State Route 138	39.44838	-83.215484
269	9	US Hwy 35 off ramp	SR 159	39.35046	-82.9764
270	9	S Bridge Street/State Route 104	US-23	39.29279	-82.946495
271	9	State Route 138	Lyndon Road/County Highway 55	39.39409	-83.323416
272	9	Westfall Road	Broadway Street/Lower Twin Road	39.33751	-83.299294
273	9	Egypt Pike/County Highway 127	Westfall Road	39.44507	-83.120455
274	2	Bypass Highway/US-20	Oak Harbor Road	41.36673	-83.134651
275	2	West Main Street/US-20	Pemberville Road	41.45348	-83.370619
276	2	Sugar Creek Road/ County Road 93	Bringe Road/County Road 38	41.41004	-83.348023
277	9	US-52/Ohio River Scenic Byway	State Route 253	38.64793	-82.851225
278	9	US-52/Ohio River Scenic Byway	Township Highway 97/Lower Twin Cre	38.63141	-83.254517
279	9	State Route 125	State Forest Road 1	38.70869	-83.135929
280	9	Carver Ridge Road/Township Highwa	Woods Ridge Road	38.80266	-82.943168
281	9	Country Club Drive	State Route 104	38.80964	-83.008132
282	2	State Route 18	E County Road 24	41.16116	-82.984395
283	2	State Route 53	County Road 6	41.02907	-83.232506
284	2	Tr 0164	N Township Road 169	41.22734	-83.073999
285	2	County Road 43	State Route 18	41.12409	-83.053793
286	5	I-75	N County Road 25A	40.16615	-84.224947
287	5	N Main Street/State Route 65	W Pike Street/State Route 274	40.43984	-84.040216
288	5	State Rte 705	S. Main Street	40.34995	-84.375434
289	5	Reineke-Schipper Road	State Route 274	40.4394	-84.107131
290	3	US-62/Atlantic Blvd	West State Street/US-62/State Route 1	40.90204	-81.168528
291	3	I-77 Exit 99	Fohl Street SW	40.72941	-81.420004
292	3	Mahoning Road/State Route 153	Belden Ave/Harrisburg Road	40.80911	-81.349815
293	3	US-62/Navarre Road	Pigeon Run Avenue/Justus Avenue	40.70629	-81.572625
294	3	E Canal Street	Market Street/Blough Avenue	40.72223	-81.518343
295	3	12th Street	Perry Drive	40.81166	-81.447804
296	3	I-77 Exit 123A/Coventry Street	E Waterloo Road	41.02918	-81.5057440
297	3	US-224/I-76 Exit 14	S Cleveland Massillon Road	41.03869	-81.6380680
298	3	Canton Road/State Route 91	Albrecht Avenue	41.04568	-81.4369980
299	3	E Aurora Road	State Route 82/Ravenna Road	41.30383	-81.4208630
300	3	Hampton Ridge Drive	Smith Road	41.14076	-81.5779870

301	3	Canterbury Drive	E Streetsboro Street/State Route 303	41.23979	-81.4127650
302	4	State Route 11	Tibbetts Wick Road/County Highway 2	41.18468	-80.6893810
303	4	State Route 7/Youngstown Conneaut	Merwin Chase Road/County Highway 1	41.25034	-80.5683210
304	4	State Route 88/Greenville Road	SR 7	41.38647	-80.5685300
305	4	TR 888 Copeland Ave NM	Champion	41.29133	-80.8610230
306	4	Olive	Belmont Ave	41.1731	-80.7504770
307	7	I-77	S Bridge Street	40.39464	-81.556752
308	7	State Route 93/ Mill Street SW	Hickory Drive	40.4998	-81.660901
309	7	State Route 258	Gilmore Road	40.22786	-81.42785
310	7	Tremont Street	E 13th Street	40.53455	-81.47951
311	6	US Route 33	Scottslawn Road	40.21357	-83.308687
312	6	State Route 37	State Route 739/State Route 37	40.48232	-83.320001
313	6	State Route 31	Treaty Line Road/State Route 739	40.45366	-83.455507
314	6	Tawa Road	State Route 37/S Franklin Street	40.41831	-83.29259
315	1	US Highway 30	State Route 66	40.87429	-84.350286
316	1	State Route 116	Gamble Road	40.83722	-84.504719
317	9	State Route 324	Main Street	39.16211	-82.434793
318	8	I-71 Exit 32	State Route 123	39.41418	-84.153641
319	8	I-71 Exit 25	State Route 741/Kings Mill Road	39.3579	-84.264986
320	8	State Route 3/Montgomery Road	Fields Ertel Road	39.2909	-84.29898
321	8	State Route 132	Lundy-Whitacre Road	39.33216	-84.063619
322	8	Old Stage Road	Preston Drive	39.53953	-84.083303
323	8	Kings Water Drive	Waterstone Blvd	39.29724	-84.301929
324	7	I-77 Exit 16	Township Road 301	39.62849	-81.461571
325	7	US-50/Ohio Scenic Byway	State Route 339	39.28655	-81.657635
326	7	State Route 60	A E Miller Road	39.48276	-81.457272
327	7	Green Street	Ohio River Scenic Byway/State Route 7	39.38883	-81.229281
328	7	Tick Ridge Road	Township Road 239	39.37669	-81.721985
329	3	Conneaut Cincinnati Highway Exit 19	State Route 301	40.93433	-82.109318
330	3	State Route 94/N Church Street	Alt US-30/W Main Street	40.79885	-81.698727
331	3	W Lincoln Way/US-30	SR 60	40.78638	-82.26234
332	3	Creamery Rd	South Main St	40.67559	-81.869522
333	3	N. Summit	W Main St	40.86224	-81.861625
334	1	I-80	State Route 49	41.63079	-84.766082
335	1	State Route 49	County Road M-50	41.60959	-84.76925
336	1	East Lawrence St	S Harrison Street	41.58247	-84.604724
337	1	I-75 off ramp	State Route 6	41.35097	-83.625521
338	1	State Route 582/Middleton Pike	State Route 64/Haskins Road	41.45925	-83.703413
339	1	State Route 25/N Dixie Highway	Five Point Road/Township Highway 10	41.50721	-83.640831
340	1	Cloverdale Road	Bowling Green Road/County Road 237/	41.36292	-83.571682
341	1	Hockenberry Road	Hoytville Road/Township Highway 123	41.19005	-83.832411
342	2	State Route 53	State Route 699/County Highway 95	40.80314	-83.419247
343	2	State Route 294	Township Highway 108	40.73786	-83.3239
344	2	County Highway 95	State Route 294	40.73752	-83.419865