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Observational Survey of Safety Belt Use in Ohio

Submitted by:

Robert L. Seufert, PhD., Director
Kaitlin A. Kubilius, Research Associate
Teresa D. Newton, Analyst
Amy J. Walton, Database Manager

Applied Research Center
Miami University Middletown
2 South Main Street
Middletown, OH 45044
(513) 217-4306
FAX (513) 217-6777
seuferrl@muohio.edu

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All correspondence regarding this report should be directed to the Governor's Highway Safety Office, by mail at P.O. Box 182081, Columbus, Ohio 43218-2081, by phone at (614) 466-3250, or by fax at (614) 728-8330.

Executive Summary

Overview: Ohio's overall 2007 seat belt usage rate is **81.6%.** This estimate, which has a minimum margin of error of ± 2%, was derived from the second observational survey (of two) and is the seat belt use rate formally reported to the National Highway Traffic Safety Administration (NHTSA) for Ohio. The 2007 rate is nearly identical to the 2006 usage rate of 81.7%.

Retired officers of the Ohio State Highway Patrol (OSHP) made observations at 265 sites in 53 of Ohio's 88 counties. The observations included 22,873 occupants (18,412 drivers and 4,461 passengers) of non-commercial passenger cars, vans, minivans, sport utility vehicles (SUVs), and pickup trucks. Additional findings, which remain consistent with previous surveys, include the following:

- As in the past four years, the usage rate of pickup truck occupants (71%) is significantly lower than that of occupants of passenger cars (83%), minivans (85%), or SUVs (83%).
- The Southwest and Central regions of the state have the highest seat belt usage rate (both at 84%) while the Southeast region has the lowest (79%).
- The usage rate for drivers (82%) continued to be higher than that of passengers (81%).
- Female vehicle occupants again have a higher rate of seat belt use (86%) than male occupants (78%).
- Caucasian vehicle occupants have a significantly higher rate of seat belt use (82%) than African-American occupants (74%).
- For vehicle occupants ages 15 and above, there was a steady increase in seat belt use as age increased. Seat belt use is lowest for vehicle occupants ages 15-25 (76%) and highest for occupants ages 65 and above (88%).

The combined *Click It or Ticket/What's Holding You Back?* media campaign initiatives have been fully implemented to increase seat belt use in Ohio. Although some groups have relatively low seat belt use rates, individual rates for subsets of the sample have all improved. The following increases have been seen in sub-populations since the 2000 campaign:

- Between 2000 and 2007, seat belt use rates have increased significantly in all regions of the state:
  - Central region rates of seat belt use increased from 65% to 82%
  - Northeast region use rates increased from 61% to 82%
  - Northwest region use rates increased from 65% to 81%
  - Southeast region use rates increased from 67% to 78%
  - Southwest region use rates increased from 62% to 83%
- However, usage rates between 2006 and 2007 were somewhat stagnant.
- Usage rates for all vehicle types have increased. Most notably, the seat belt use rate of pickup truck occupants has increased from 49% in 2000 to 71% in 2007 (down slightly from 2006, at 74%).
- Seat belt use rates for both drivers and passengers have increased (from 66% in 2000 to 82% in 2007 for drivers and from 62% in 2000 to 81% in 2007 for passengers).
- Male seat belt use has increased from 55% in 2000 to 78% in 2007.
- Between 2000 and 2007, seat belt use rates for the following age groups increased: from 54% to 76% for ages 15-25; from 66% to 82% for ages 26-64; and from 71% to 88% for ages 65 and older.

Recommendations: This 2007 survey has identified the following populations that continue to warrant special attention because of their lower rates of seat belt usage. Due to the absence of a **primary** seat belt law in Ohio, to increase overall seat belt use, greater compliance must occur among populations with relatively low rates of seat belt use. Hence, ongoing media and enforcement initiatives which promote greater seat belt use must be strengthened and directed disproportionately at the following populations:

- Southeast region drivers and passengers
- Pickup truck drivers and passengers
- Male drivers and passengers
- Drivers and passengers ages 15-25

Background

Since 1991, Ohio has conducted an annual observational survey to determine seat belt use following guidelines set by the National Highway Traffic Safety Administration (NHTSA). These guidelines have traditionally given individual states much discretion in survey design and implementation, with the stipulation that each state must generate a probability-based estimate for seat belt usage of front outboard occupants of passenger vehicles. This seat belt use estimate must have a required level of precision of less than 5% relative error and a 95% confidence coefficient. Individual states have been permitted to decide how much additional information to collect based on the resources available.

In 1998, NHTSA requested that states collect vehicle-specific information as part of the survey process. Specifically, all states were asked to collect information that would permit them to generate usage rates for four types of vehicles: passenger cars, minivans, sport utility vehicles (SUVs), and pickup trucks. Since 1991, and prior to 1998, Ohio's survey only collected data from passenger cars, minivans and SUVs, and results from each site were pooled so that observers did not record use for individual vehicles. That is, prior to 1998, the only data available was aggregated data from each site that provided overall counts of driver and passenger seat belt use. Thus, in 1998, Ohio's survey required some modifications in the way that seat belt use data were collected in order to provide the kind of vehicle-specific information that the federal sponsors requested. The 2007 survey was conducted similarly to the surveys of previous years, with a few modifications: data on license plate origins have not been collected since 1999 because data on out-of-state vehicles were only a very small proportion of vehicles observed during previous years.

Data were collected from vehicles stopped at randomly selected intersections and freeway off-ramps so observers had ample opportunity to collect data from each individual vehicle observed. Traffic control devices such as traffic signals or stop signs were present at all observation site locations. This method gives observers not only the opportunity to collect general use data, but to collect additional demographic information on seat belt use in addition to vehicle type. Ohio and other states have found differences in seat belt use as a function of vehicle type, sex, and age. Research also indicates that seat belt use varies as a function of race and ethnicity. Consequently, the race of vehicle occupants was added to the survey in 2004 and retained in subsequent surveys. Modifying the survey to collect vehicle-specific information (i.e., data on usage in various vehicle types) and demographic data vastly increases our knowledge about the Ohioans who are likely to wear (or not wear) their seat belts.

Also, to provide geographical information about regional trends in seat belt use, the survey is structured to estimate seat belt use on a regional level. That is, the sample is stratified by geographic region to allow for estimation of seat belt use in various parts of the state.

This narrative contains the following sections: [1]

- **Methodology**: The methodology, approved by NHTSA, outlines the manner in which observation sites were chosen and data were collected and analyzed.
- **Results**: Descriptive results of seat belt use (e.g., percent of observations by sex, age, vehicle type, etc.) are presented first in the same manner as in past *Observational Surveys of Seat Belt Use in Ohio*.
- **Recommendations**: Recommendations are based on the data derived from both the descriptive statistics and the multivariate analysis.
- **References** and **Appendices** containing observation sites and forms are also included.

The following section, Methodology, is a full description of the methodology approved by NHTSA to estimate seat belt use in 2006.

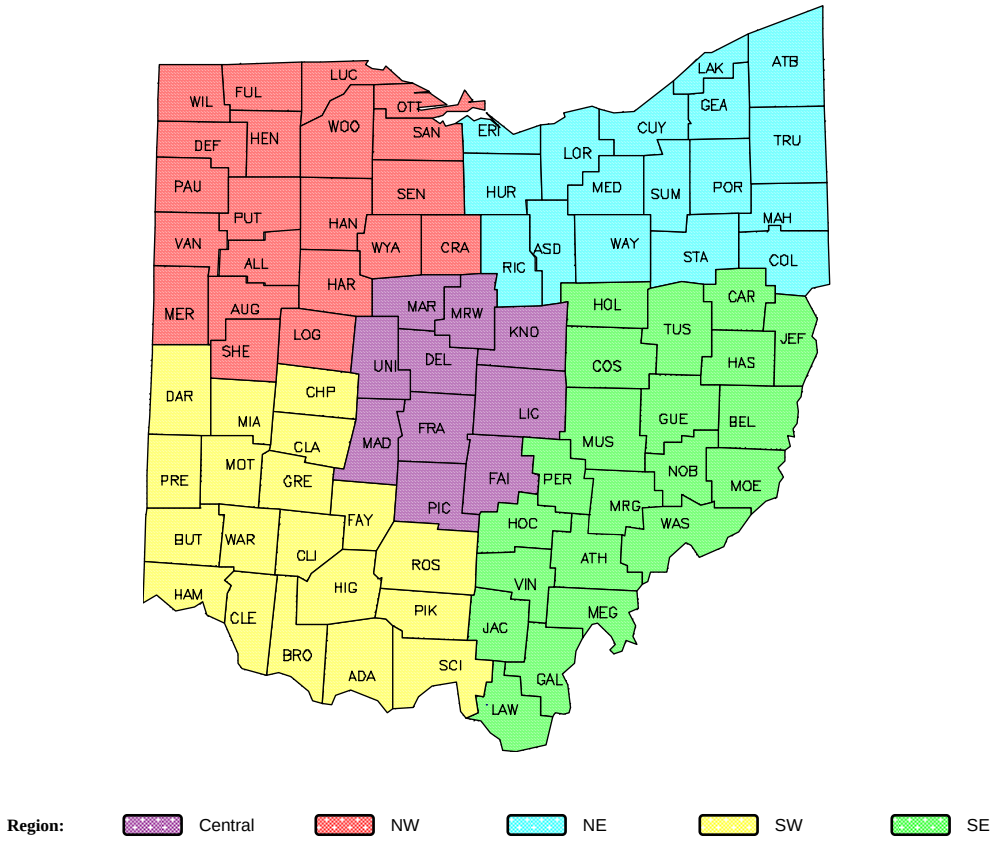
[1] In 2005, extensive statistical analysis was performed on the data to further explore the relationship between the variables (e.g., driver, passenger, vehicle, and site characteristics) in the observational surveys and driver and passenger seat belt use. This included correlation coefficients and logistic regression that showed relationships between variables, helping to further define populations that could benefit from media and/or enforcement initiatives. Comparable statistical analysis of the 2007 data will be included in a separate report.

Methodology

Sample Stratification

As in previous years, the 2007 sample was stratified by region. Observation sites were randomly selected intersections and off-ramps from each of the five geographic regions of the state (Figure 1). The method of selection described later in this section was used to ensure that all intersections and off-ramps in the state had *an equal probability of selection*. That is, all intersections and off-ramps, regardless of their location or traffic volumes, had equal likelihoods of selection as survey sites.

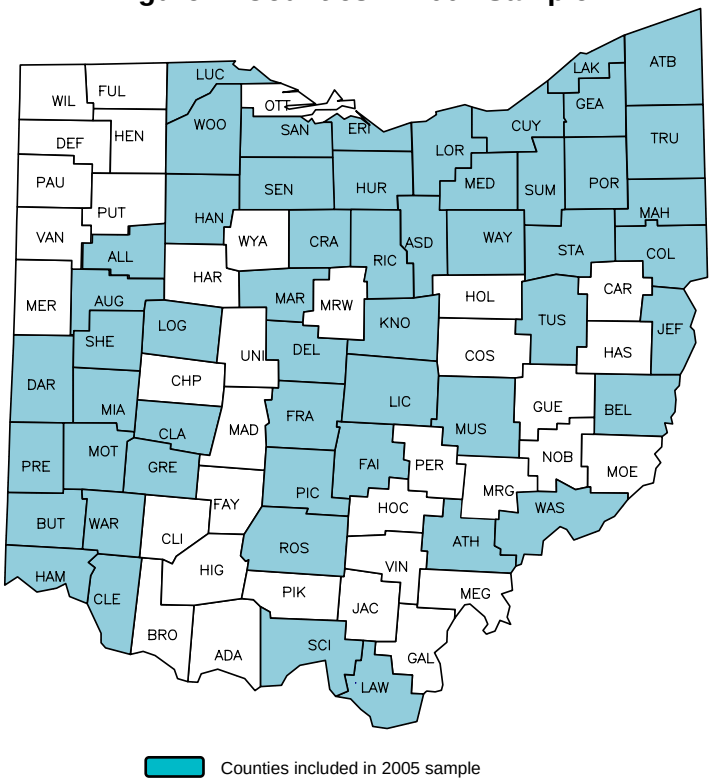
Figure 1: Counties by Region



As a preliminary measure to eliminate many low-volume sites, counties with low populations (and low rates of vehicle-miles of travel [VMT]) were excluded from the sample space. Federal guidelines permit the exclusion of low-population counties (cumulatively accounting for 15% or less of the state's population) from the sample space so that the costs of sampling in these areas may be constrained. The present survey methodology excluded

35 low-population counties that cumulatively account for approximately 10% of the state's population,[2] reducing the sample of Ohio counties from 88 to 53 (see Figure 2 for counties).

Figure 2: Counties in 2007 Sample



Sample Size and Allocation to Strata

Observation sites within this sample of Ohio counties were randomly selected signalized intersections (i.e., with a traffic signal or stop sign) and freeway off-ramps. These signalized locations allow for more detailed vehicle, driver, and occupant information to be recorded by observers while vehicles are stopped. Studies have shown that there is no discernible difference in the accuracy and reliability of use estimates obtained through stopped-vehicle direct observation (SVDO) compared to moving-vehicle direct observation (MVDO) (Eby, Streff, & Christoff, 1996). Although Ohio's survey previously employed the MVDO method, the change to an SVDO method enables the collection of more detailed information without any loss in accuracy.

The necessary number of intersection and off-ramp sites was determined based on two factors. Of primary consideration was the number of observations necessary to estimate seat belt use with 5% relative error and 95% confidence. Second, the number of sites had to be large enough to ensure a fairly equitable distribution of sites across days of the week and times of the day. First, the number of observations needed to estimate seat belt use at the alpha = .05 (95% confidence) level was determined. A power analysis was performed using data from Ohio's

[2] Some low-population counties were included to ensure that all regions would be adequately represented in the sample space.

past observational surveys. Based on this analysis, a minimum of 7,600 observations were required to estimate overall seat belt use with the desired amount of precision.

The next step in determining the necessary number of sites was to estimate the average number of observations that could be made at each site. Pilot tests of Ohio's data collection form, and the results of similar surveys in other states, indicated that a conservative estimate would be an average of 50 observations per site per hour. To achieve the desired minimum of 7,600 observations, at least 152 sites would be required for data collection. For the 2007 survey, as in previous years, this number was increased to 265 sites to ensure that sites would be equitably distributed across strata, days of the week, and times of day. Also, all sites were physically reviewed prior to the official observation to ensure site integrity; these sites were either reviewed by Ohio State Highway Patrol (OSHP) observers or by an employee of the Governor's Highway Safety Office (GHSO) in 1999, 2000, and 2002 through 2007. A list of the 265 observation **Site Locations** is contained in Appendix A.

Sites were allocated to strata proportionally based on Vehicle Miles of Travel (VMT). That is, the proportion of the total 265 sites allocated to each stratum was determined based on the proportion of the total statewide VMT in each region. Table 1 lists the VMT and number of sites in each stratum. This method of site distribution allocated more sites to more heavily traveled regions of the state. Thus, in the overall state estimate, more statistical weight was given to more heavily traveled regions. The resulting rates represent seat belt use per vehicle-miles of travel.

Table 1: Number of Sites Allocated to Strata

Strata	Region	VMT	% of Total	Number of Sites
1	Central	19,125,142,250	17.06%	39
2	Northeast	39,048,316,850	34.83%	101
3	Northwest	16,126,506,650	14.39%	39
4	Southeast	9,527,602,300	8.50%	18
5	Southwest	28,270,348,650	25.22%	68
	TOTAL	**112,097,916,700**	**100.00%**	**265**

Finally, the number of intersections and freeway off-ramps to be observed in each stratum was determined. As a first step in determining the number of intersections and off-ramps that would be selected as observation sites, the percentage of annual traffic on these types of roadways was computed. Based on estimates from the Ohio Department of Transportation, roughly 31% of all travel occurs on limited access roadways (i.e., interstates and expressways/freeways). Accordingly, 31% of the sites in each stratum should be randomly selected freeway exit ramps, and the remaining 69% of the sites should be randomly selected intersections. Table 2 lists the final number of intersections and off-ramps selected from each stratum.

Table 2: Number of Intersection and Off-Ramp Sites in Strata

Strata	Region	Off-Ramp Sites	Intersection Sites	Number of Sites
1	Central	12	27	39
2	Northeast	29	72	101

3	Northwest	12	27	39
4	Southeast	6	12	18
5	Southwest	19	49	68
	TOTAL	**78**	**187**	**265**

Site Selection Procedures

Sites were selected during the planning of the 1998 survey and were used again in the years that followed, with the exception of those sites described as problematic by the observer (for safety, observation clarity, or other reasons) and those considered to be low volume.[3] Such sites were replaced using the same procedures described below. They were then observed for traffic flow. In addition, when an alternate site was observed in 2006, it became a primary site in 2007, and a new alternate site was selected using the following procedures.

Two different methods were used to randomly select intersections versus off-ramps. These methods follow those described in Eby and Streff (1994) and Eby and Hopp (1997). In selecting intersection sites, detailed, equal-scale county maps were used. A grid pattern was overlaid on each county map, with each square in the grid identified by a number on the abscissa (X-axis) and the ordinal (Y-axis). The grid lines were spaced 1/4 inch apart.

The following intersection site selection procedure was used for each stratum. First, all eligible counties in each stratum were assigned a number. Using a statistical program to generate random numbers, a number representing a county was selected. Thus, each eligible county had an equal probability of selection at this point. Once a county was selected, X- and Y-coordinates on the grid were selected, again using the random number generator. As in the first step, all intersections had an equal probability of selection at this stage. If a single intersection fell within the square, that intersection was chosen as an observation site. If the square did not fall within county boundaries, if the square did not contain an intersection, or if the intersection was located one road link from an intersection already selected, the entire selection was discarded and a new county selection was made (i.e., the process started over from the first step). If more than one intersection fell within the grid square, one of the intersections was selected at random and the appropriate weights were applied.

To determine the observer's location at a chosen site, the following procedure was applied: For each intersection, all possible combinations of street and traffic flow were determined. In this set of potential observer locations, one location was selected with probability equal to 1 divided by the number of locations. If the intersection was a four-legged intersection, the probability of selection for observer location was 1/4. In the case of "T" or "Y" intersections, there are only three possible observer locations, so the probability of selecting an observer location was 1/3. The effect of this difference in the probability of selection is negligible (see Eby & Hopp, 1997).

[3] Low-volume sites are defined as sites having 10 or fewer observations in the years 2000 through 2005.

For each primary site chosen using the procedure described above, an alternate site was selected within an estimated 15-square mile radius of the primary site. These sites were also selected using a grid and randomly selected coordinates.

Freeway exit ramps within each stratum were also selected as randomly as possible. All eligible exit ramps in each of the five strata were numbered. The required number of ramps in each stratum was randomly sampled without replacement. Once ramps were selected, all possible combinations of traffic flow and observer locations were determined. These possible locations were then sampled with equal probability. For each site, a direction of travel was randomly selected. Alternate sites were the next interchange on the freeway along this direction. If the exit ramp had no traffic control device (i.e., stop sign or traffic signal) on the selected direction, the observer randomly picked a travel direction and lane with a traffic control device by flipping a coin.

Once all sites were selected, each site was assigned a number between one and 265; this number represents the total number of sites actually observed. Sites were randomly assigned to days of the week (weekdays as well as Saturday and Sunday) and time of day (7:00 AM to 7:00 PM). All days and eligible times had equal probability of selection. If circumstances arose that rendered a site unobservable at a predetermined day and time (e.g., heavy rain, construction, etc.), an administrative decision was made to determine site rescheduling.

Following Eby and Hopp, each observation site was self-weighted by traffic volumes within each stratum. That is, all sites had an equal observation interval (50 minutes). Traffic counts were recorded by observers at each site for the lane of traffic under observation. Only vehicles eligible for inclusion in the survey were counted. Seat belt use in each region (stratum) was then weighted by traffic volumes at the site so that more heavily-traveled sites (compared to those sites with lighter traffic) carried a greater weight in the regional estimates and overall state estimate.

Data Collection and Observer Training

Retired officers of the Ohio State Highway Patrol (OSHP) conducted field observations. Observers were instructed to dress in plain clothes[4] so that their presence would not unduly influence motorists' behavior. Observers were provided a PDA with electronic versions of survey forms (see Appendices B and C), a list of survey sites, alternate sites, observation locations, and a schedule for data collection days and times.

Eligible vehicles were all passenger cars, vans or minivans, SUVs, and pickup trucks. Historic vehicles were not to be included in the survey; observers were instructed to disregard all vehicles of this type.[5] Observations during

[4] Recommended attire for observers in the field was dark pants or shorts and a white or light-colored shirt.
[5] Historic vehicles are defined as any vehicle bearing a state-issued historic vehicle license plate.

2007 focused on non-commercial vehicles.[6] Therefore, commercial vehicle data were excluded from the 2007 analysis, as recommended by NHTSA. For all eligible vehicles, seat belt use information and demographic information were recorded for front outboard occupants (drivers and front-seat passengers).

Those conducting observations attended a training session at a central location. This training provided detailed information on procedures to be followed at each site. Each observer received a manual outlining all field procedures and a site schedule specifying the date and time each site was to be observed. Observers also received specific instructions as to which lane of traffic they should observe at the site and an instrument to perform traffic counts. This location was pre-determined and randomly selected. Training consisted of a review of the documentation, a description of how to input collected data into the PDAs and then uploaded to the Applied Research Center's server, and a discussion centering on how to handle unexpected issues in the field. If an observer was unable to attend the training, he or she was sent the training manual and all materials, and required to discuss the observations with either the GHSO survey coordinator or the observer coordinator.

Of primary consideration in the training session was how to decide when a site would be unobservable. Observations were to be made in all weather conditions unless the weather obscured observers' views into the vehicles in the designated lane of traffic they were observing or presented a safety hazard to the observer in the field. If unexpected conditions made observations difficult or impossible (e.g., construction, damaged power lines, etc.) observers were instructed to document the problem on the site description forms and to move to the alternate site for data collection. If problems arose at the alternate site, observers were instructed to proceed to the closest observable site.

Observers were informed that for quality control purposes, several sites were to be randomly selected for unannounced visits to ensure that the study procedures were followed. Fourteen sites (5% of the total) were monitored by the observer coordinator (through both visits to observers at observation sites and through phone contact) and all monitoring visits or calls indicated that observers were fully complying with field procedures. Regular contact with observers was maintained during the survey period to ensure that survey protocols were followed.

Upon arriving at a site, observers completed an electronic version of the **Site Description Form** (see Appendix B) for each site observed. This form provides information on the nature of the site (intersection or off-ramp), location of the site, time and day observed, start and end times of data collection, and information regarding conditions at the site (e.g, weather, visibility, etc.). Following Eby & Hopp, usage rate estimates are weighted by VMT at the site. Observers recorded traffic counts for five minutes before the observation period began and for

[6] Commercial vehicles are defined as any vehicle bearing the name of a business or any unmarked vehicle transporting commercial equipment.

another five minutes following the end of the observation period. Weights were applied in the same manner as described in Eby & Hopp.[7]

Observers collected data at each assigned site for 50 minutes, recording as many observations as possible during that time. Observers recorded seat belt usage information and demographic information, both while vehicles were stopped in the designated lane at the traffic control device, and while traffic was moving through the intersection. When traffic was moving, observers were asked to record data for as many vehicles as possible.

Observers recorded the following information *for each noncommercial vehicle observed* by checking the appropriate category or categories on the PDA's **Data Collection Form** (see Appendix C):

- Vehicle type (passenger car, van/minivan, SUV, pickup truck,)
- Driver and front outboard passenger seat belt usage (belted, unbelted)
- Driver and front outboard passenger sex (Male, Female)
- Driver and front outboard passenger age (0-4, 5-14, 15-25, 26-64, 65+)
- Driver and front outboard passenger race (Caucasian, African-American, Other)

Statistical Analysis

Each PDA's **Site Description Forms** and **Data Collection Forms** were returned directly and electronically to the Miami University Applied Research Center and a cursory review of the forms and data from each observer and site was performed. Site and vehicle-specific information were linked in the final dataset used for statistical analysis. All analyses were performed using a combination of Microsoft Excel, Access, and SPSS.

Estimates from each site were weighted by VMT in corresponding regional estimates, and each regional estimate was weighted by VMT in the overall statewide estimate. To accomplish this, the two five-minute traffic counts from each site were summed and multiplied by five. The resulting value represented the *estimated* total number (N_e) of vehicles that passed through the site during the fifty-minute observation interval (Eby & Hopp, 1997). To compute seat belt usage rates, this estimated count (N_e) was divided by the actual vehicle counts from each site, yielding a weighting factor. Weights were then multiplied by the number of belted front seat occupants and total occupants. This process is summarized in Formula 1.

[7] "The weighting was done by first adding each of the two five-minute counts and then multiplying this number by five so that it would represent a 50-minute duration. The resulting number was the estimated number of vehicles passing the site if all eligible vehicles had been included in the survey during the observation period at the site. The estimated count then was divided by the actual vehicle counts at the site, yielding a weighted N for the number of total drivers and passengers and total number of belted drivers and belted passengers for each vehicle type" (Eby & Hopp 1997, p.14).

$$r_h = \frac{\sum \frac{N_e}{N_a}(N_b)}{\sum \frac{N_e}{N_a}(N_o)} = \frac{\text{Total number of belted occupants, weighted}}{\text{Total number of occupants, weighted}}$$

Formula 1

where:

r_h = Seat belt usage rate in stratum h
N_e = Estimated traffic count (at site i in stratum h)
N_a = Actual traffic count (at site i in stratum h)
N_b = Number of belted occupants (at site i in stratum h)
N_o = Number of occupants observed (at site i in stratum h)

This formula was used in computing the overall estimate. The formula was modified in estimating usage rates for subgroups. For example, N_a in the formula above was changed to reflect the actual number of vehicles in the subset by drivers, passengers, passenger cars, SUVs, vans/minivans, pickup trucks, males, and females (etc.) observed at a site during the 50-minute observation period. Thus, seat belt usage estimates for subgroups were also weighted by VMT at the sites.

Overall seat belt usage rates were computed from regional estimates using the following formula:

$$r_{total} = \sum_{i=1}^{h} \frac{V_h r_h}{V_{total}}$$

Formula 2

where:

r_{total} = Overall seat belt usage rate
r_h = Seat belt usage rate in stratum h
h = Total number of strata in sample
V_h = Estimated VMT in stratum h
V_{total} = Total statewide estimated VMT

Variance for usage rate estimates was computed using the following formula (Eby & Hopp, 1997). First, variance estimates were computed for each stratum using Formula 3.

$$\sigma_h^{\,2} = \frac{V_h}{V_h - 1} \sum \left(\frac{g_i}{g_{total}} \right)^2 (r_i - r_h)^2$$

Formula 3

where:

σ_h^2 = Variance for stratum h
V_h = Estimated VMT in Stratum h
g_i = Weighted number of vehicle occupants at site i
g_{total} = Total weighted number of occupants in stratum h
r_i = Seat belt usage rate at site i
r_h = Seat belt usage rate in stratum h

Overall variance estimates were computed from stratum variance estimates using Formula 4[8], again following Eby and Hopp (1997).

$$\sigma_{total}^{\ 2} = \sum \left(\frac{N_h}{N} \right)^2 \sigma_h^{\ 2}$$

Formula 4

where:

σ_{total}^2 = Overall variance
N_h = Number of sites in stratum *h*
N = Total number of observed sites
σ_h^2 = Variance for stratum *h*

Standard deviations were computed by taking the square root of the variance. Confidence intervals were computed using the standard formula:

$$\mu = r_{total} \pm 1.96\ \sigma_{total}$$

Formula 5

Other usage rate and corresponding standard deviation may be substituted for r_{total} and σ_{total}.

During 2005, data from the observation surveys and site description forms were combined and analyzed using correlation coefficients and multivariate analysis (i.e., logistic regression). Results of a similar analysis of the 2007 data will be included in a separate report. This multivariate analysis further clarifies the relationship between driver and passenger seat belt use and other driver, passenger, vehicle, and site characteristics. Since the dependent variable is binary (correctly wearing a seat belt = 1 while incorrectly wearing a seat belt or not wearing a seat belt = 0), logistic regression was used to conduct the analysis.

[8] This formula may also be expressed as $(V_h/V)^2\ s^2_h$ [where V_h = est. VMT in stratum h and V = total est. VMT], if so desired.

For more than a single independent variable, the logistic regression model can be written as follows:

$$\text{Probability (event)} = \frac{e^z}{1+e^z}$$

or, when Z is due to the linear combination of variables:

$$Z = B_0 + B_1 X_1 + B_2 X_2 + \ldots + B_p X_p$$

In the above regression equation, each B value (i.e., B_1 through B_p) represents the odds of an event, such as correctly wearing a seat belt, controlling for other variables in the logistic regression model or equation (Norusis, 1999; Hosmer and Lemeshow, 2000). Results of a multivariate analysis of the 2007 data will be included in a separate report.

Results

Statewide Seat Belt Use

The 2007 overall seat belt use rate for vehicle occupants from Ohio is 81.6% (Table 3). This rate is nearly unchanged from the 2006 rate of 81.7%. The 2007 estimate of 81.6% has a standard deviation of 1% and a relative error of 2% or less due to the large sample of observations, well within NHTSA specifications.

Alone, this rate is a point estimate of seat belt usage. Applying a confidence interval determines a range of values that allows seat belt usage to be estimated with a desired amount of confidence. NHTSA guidelines specify a 95% confidence level. By applying Formula 5, we can be **95% certain** that Ohio's seat belt usage for all vehicle occupants is within ± **2% of 81.6%**.

95% Confidence Interval: **79.6% - 83.6%**

A total of 22,873 occupants were observed (18,412 drivers and 4,461 passengers) at 265 sites. This far exceeds the NHTSA requirement of 7,600 observations. This means that on average, 69 vehicles and 86 occupants were observed per site.

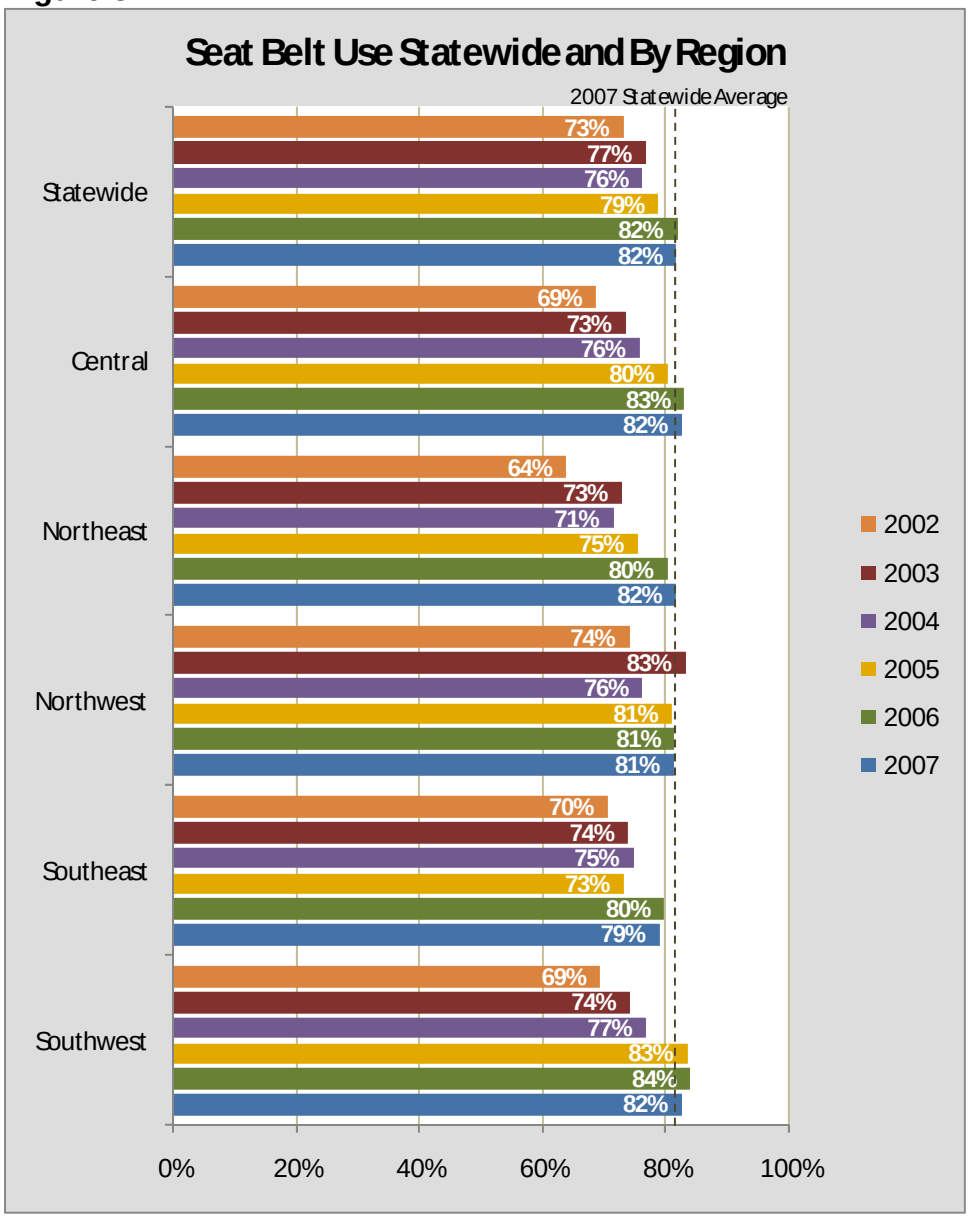
Regional Seat Belt Use

Table 3: Regional Usage Rates

Region	Usage Rate
Central	82.44%
Northeast	81.51%
Northwest	81.13%
Southeast	78.84%
Southwest	82.45%
Statewide	**81.62%**

As can be seen in Table 3, the Northeast, Northwest, and Southeast regions of the state have a seat belt use rate below the state average. The Northeast region is also the state's most heavily traveled and heavily populated region of the state.

Figure 3

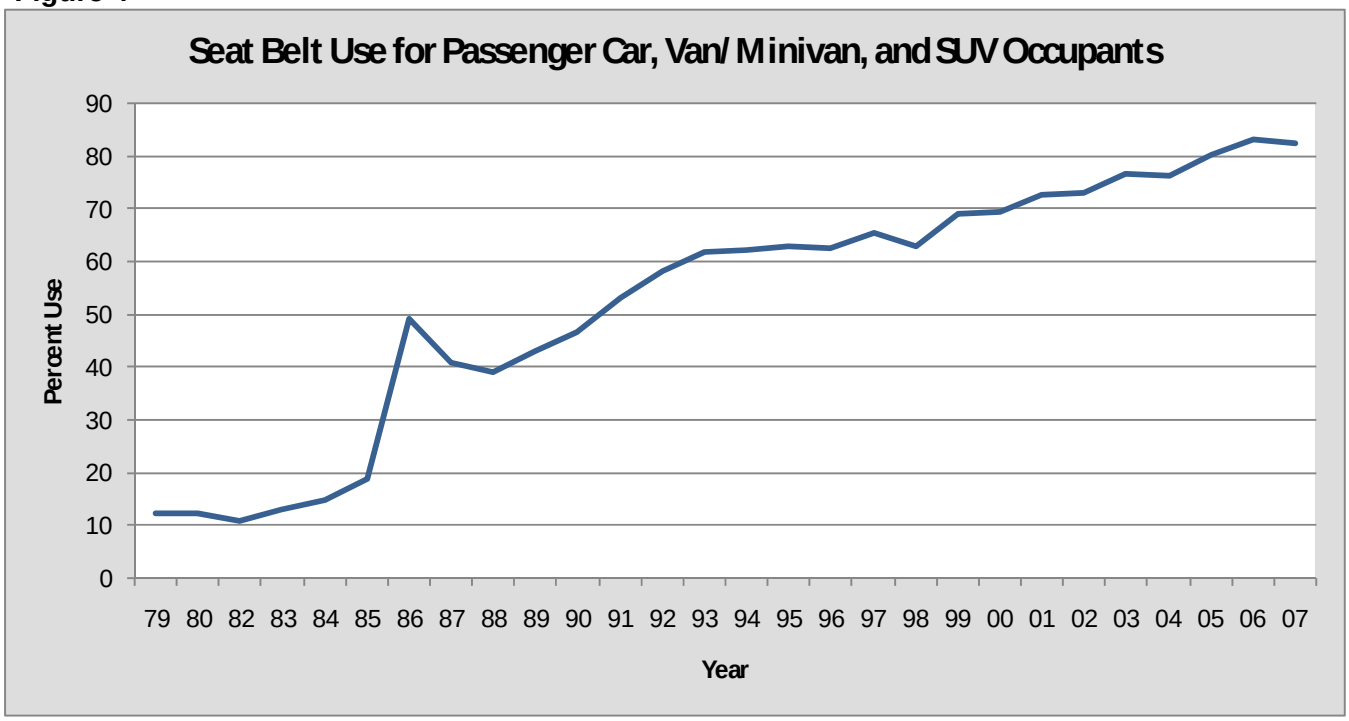


As shown in Figure 3, with few exceptions, seat belt use increased yearly between 2002 and 2006 for all regions. However, from 2006 to 2007, seat belt use remained the same or decreased in all regions except for the Northeast.

It is important to note that the overall estimate is based on all front outboard occupants observed in all four vehicle types.[9] Because pickup trucks were excluded from the survey until 1998, this year's rate is only comparable to rates since 1998. Calculating the 2007 rate without pickup trucks indicates a usage rate of approximately 82%. Figure 3 represents seat belt usage rates including only passenger cars, vans/minivans, and SUVs. Also, because 1999 was the first year for commercial vehicle data to be collected, they too are excluded from this historically comparable rate as specified by NHTSA.

[9] Data on the four vehicle types – passenger cars, vans/minivans, Sport Utility Vehicles, and pickup trucks – have been collected since the 1998 survey.

Figure 4



Vehicle Type and Seat Belt Use

As in previous surveys, pickup truck occupants have a significantly lower seat belt use rate than other vehicle occupants during 2007, presenting an opportunity to increase overall seat belt use in the future (see Table 4).

Table 4: Usage Rate by Vehicle Type

Vehicle Type	Usage Rate
Passenger Car	82.90%
Van/Minivan	85.38%
SUV	82.77%
Pickup Truck	70.79%

The results for each vehicle type by region are presented in Table 5.[10] As shown, occupants of pickup trucks had a significantly lower rate of seat belt use rates than occupants in all other vehicle types, regardless of region.

Table 5: Vehicle Type Regional Usage Rates

Region	Passenger Car	Unweighted N	Van / Minivan	Unweighted N	SUV	Unweighted N	Pickup Truck	Unweighted N
Central	83.96%	2,021	85.15%	514	82.64%	743	72.21%	519
Northeast	82.65%	5,493	82.54%	1,276	82.36%	1,736	72.05%	1,514
Northwest	82.19%	1,364	88.47%	276	84.66%	459	69.69%	419
Southeast	79.56%	806	82.74%	159	81.74%	312	69.21%	260
Southwest	84.05%	2,783	88.54%	626	82.67%	864	69.29%	629
Statewide	**82.90%**	**12,467**	**85.38%**	**2,951**	**82.77%**	**4,114**	**70.79%**	**2,241**

[10] "Unweighted N" indicates the total number in observations of that category.

Figure 5

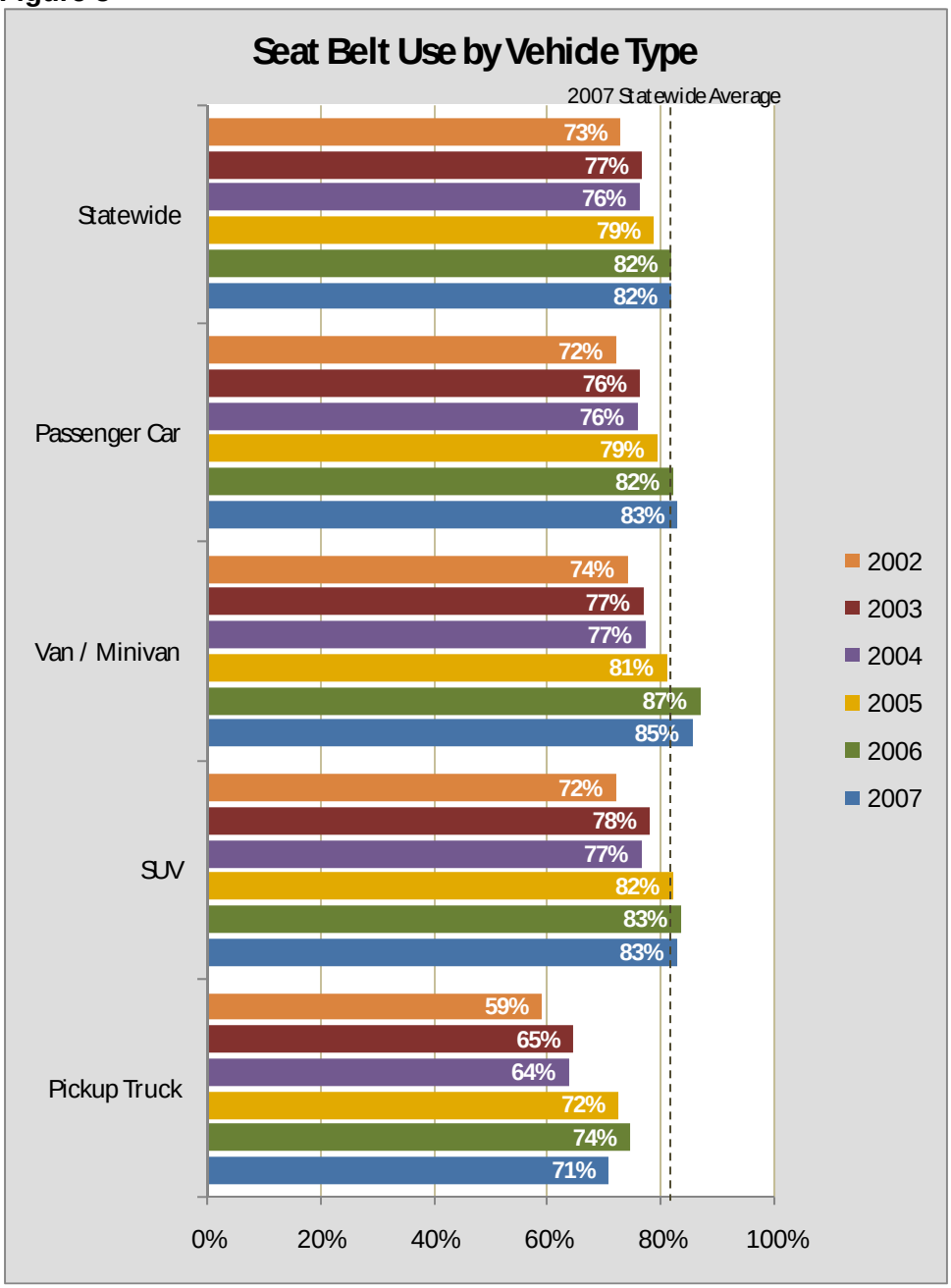


Figure 5 shows that although seat belt use increased substantially between 2002 and 2006 for each vehicle type, seat belt use fell slightly for vans, SUVs, and pickup trucks in 2007.

Driver and Passenger Seat Belt Use

Ohio's seat belt observation survey has traditionally found differences between drivers and passengers in their rates of seat belt use. Tables 6 and 7 summarize the results for drivers and passengers, respectively, by region. (1) As in previous years, the overall seat belt use rate for drivers is higher than that of passengers, although it is interesting to note that passenger use rates are higher than driver use rates in some regions (Tables 6 and 7). (2)

Driver seat belt use was highest in Southwest and Central Ohio, and lowest in the Southeast region (Table 6). (3) Passenger seat belt use was highest in the Southwest and lowest in the Northwest (Table 7).

Also of note, again this year a direct relationship was found between driver and passenger seat belt use. The correlation between driver use and passenger use was found to be $r = .67$, $p \leq .001$. Although causality cannot be inferred from a correlation, the strength of the association between driver and passenger seat belt use suggests that passengers were more likely to be belted when drivers were belted.

Table 6: Driver Usage Rates by Region

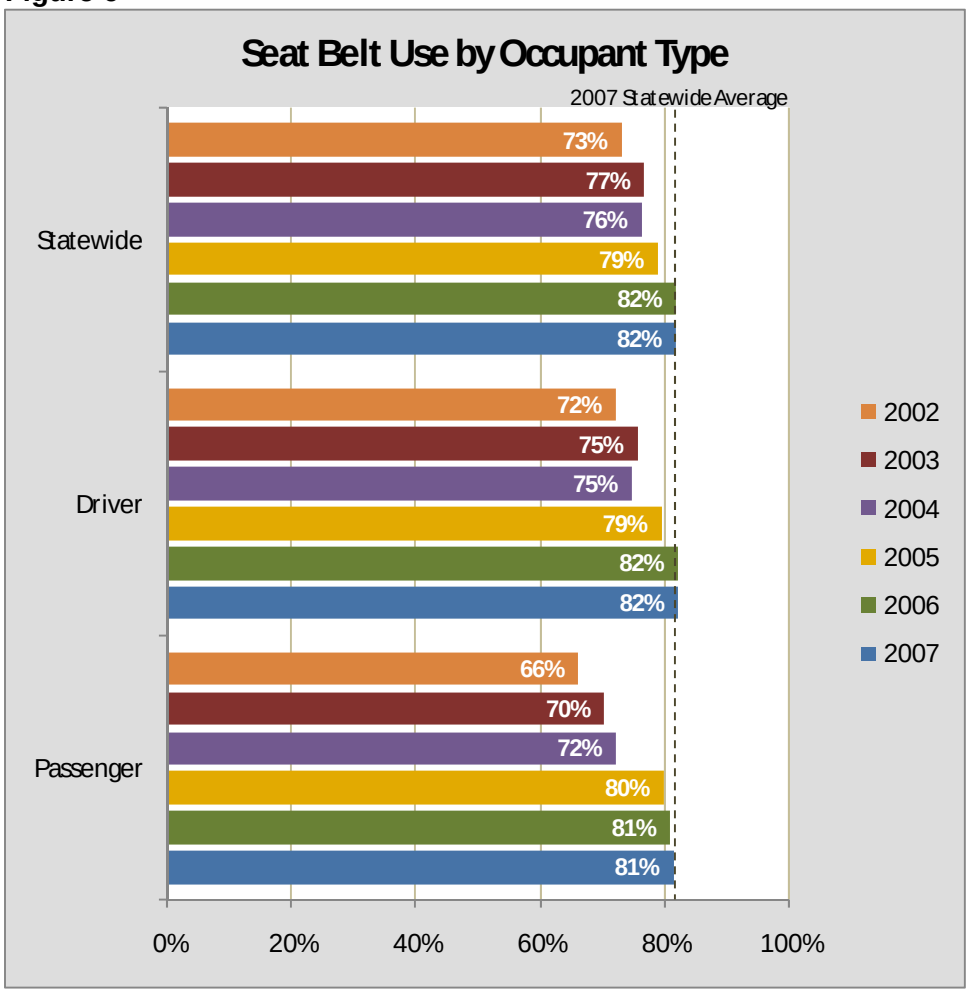
Region	Usage Rate	Unweighted N
Central	83.04%	2,918
Northeast	82.02%	8,315
Northwest	81.19%	2,059
Southeast	78.48%	1,158
Southwest	83.04%	3,962
Statewide	**82.03%**	**18,412**

Table 7: Passenger Usage Rates by Region

Region	Usage Rate	Unweighted N
Central	79.78%	879
Northeast	82.29%	1,704
Northwest	79.29%	559
Southeast	79.53%	379
Southwest	82.58%	940
Statewide	**81.26%**	**4,461**

As shown in Figure 6 on the following page, passenger seat belt use has increased since 2002 but has remained fairly steady for the past three years.

Figure 6



Sex of Vehicle Occupants and Seat Belt Use

Detailed information was collected on occupants' sex, and separate estimates were generated for male and female front outboard occupants. Consistent with the past results for Ohio and results of other states' seat belt surveys, *female occupants had significantly higher rates of seat belt usage than male occupants*. Tables 8 and 9 summarize these results by region.

Table 8: Male Occupants Usage Rates by Region

Region	Usage Rate	Unweighted N
Central	78.68%	1,910
Northeast	77.14%	5,072
Northwest	77.30%	1,415
Southeast	75.35%	760
Southwest	79.88%	2,489
Statewide	**77.96%**	**11,646**

Table 9: Female Occupants Usage Rates by Region		
Region	**Usage Rate**	**Unweighted N**
Central	85.97%	1,884
Northeast	86.42%	4,943
Northwest	85.29%	1,198
Southeast	82.11%	776
Southwest	85.75%	2,410
Statewide	**85.64%**	**11,211**

A comparison of male and female driver and passenger seat belt use rates reveals the following finding: although male drivers are less likely than female drivers to wear seat belts, this gap becomes even more pronounced when male and female passengers' rates are compared. When riding as passengers, only 75% of males were observed to be buckled up, compared to nearly 84% of female passengers. For both males and females, drivers were somewhat more likely to wear seat belts than passengers.

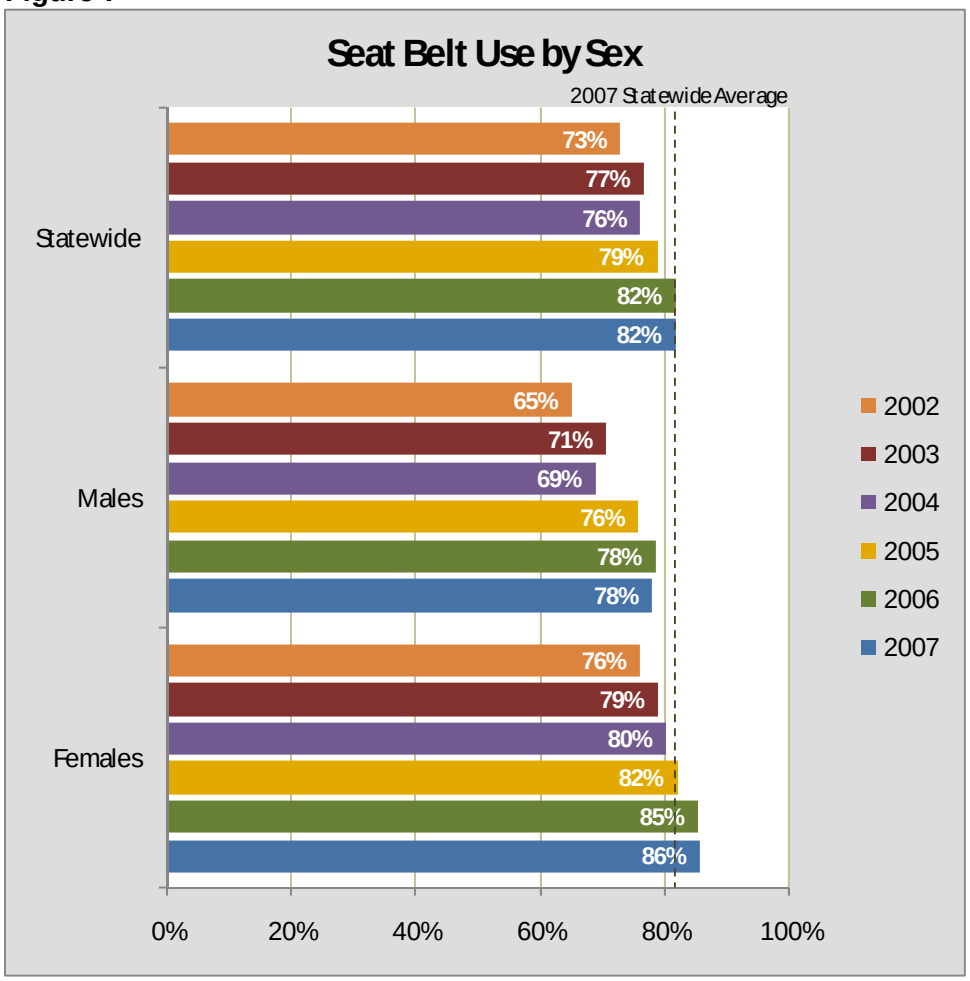
The results for male and female drivers and passengers are summarized by region in Table 10 and Table 11.

Table 10: Male Driver and Passenger Usage Rates				
Region	**Male Driver**	**Unweighted N**	**Male Passenger**	**Unweighted N**
Central	79.40%	1,617	75.98%	292
Northeast	77.73%	4,502	74.43%	570
Northwest	77.61%	1,226	74.35%	189
Southeast	75.05%	612	75.28%	148
Southwest	80.80%	2,175	77.33%	314
Statewide	**78.54%**	**10,132**	**75.49%**	**1,513**

Table 11: Female Driver and Passenger Usage Rates				
Region	**Female Driver**	**Unweighted N**	**Female Passenger**	**Unweighted N**
Central	87.38%	1,300	80.43%	581
Northeast	86.75%	3,811	85.79%	1,132
Northwest	86.11%	832	82.23%	366
Southeast	82.27%	545	81.15%	231
Southwest	86.01%	1,786	86.38%	624
Statewide	**86.19%**	**8,274**	**84.10%**	**2,934**

Figure 7 on the following page shows that male occupants, a high-risk group, improved their seat belt use by 12 percentage points between 2002 and 2006. While female seat belt use increased 10 percentage points, females' overall use was a great deal higher than male seat belt use during all years.

Figure 7



Age of Vehicle Occupants and Seat Belt Use

As in the past three years, there appears to be a steady increase in seat belt use as age increases. (1) Seat belt use for occupants ages 5-14 decreased markedly from 85% in 2006 to 80% in 2007. However, it is important to note that the number of observations conducted on this age group is relatively low, especially when broken down by stratum. (2) Seat belt use is relatively low (76%) among occupants age 15-25. (3) However, rates increase for older occupants, reaching 82% among occupants age 26-64 and 88% among those age 65 and older. Because there were too few observations, it was impossible to generate a reliable estimate for the 0-4 age group.[11]

Tables 12-15 on the following page summarize the results for each age group by region.

[11] In one sense, the low number of observations for the 0-4 age group is encouraging, as there are many risks associated with children in this age group riding as front-seat passengers. The small number observed may reflect the fact that parents are placing their small children in safety seats in the back seat of the vehicle. However, this practice renders them unobservable in this survey, as the results only describe usage for front outboard occupants.

Table 12: Occupants 5-14 Years of Age		
Region	**Usage Rate**	**Unweighted N**
Central	78.87%	102
Northeast	77.95%	188
Northwest	84.70%	64
Southeast	82.62%	33
Southwest	81.07%	110
Statewide	**80.28%**	**497**

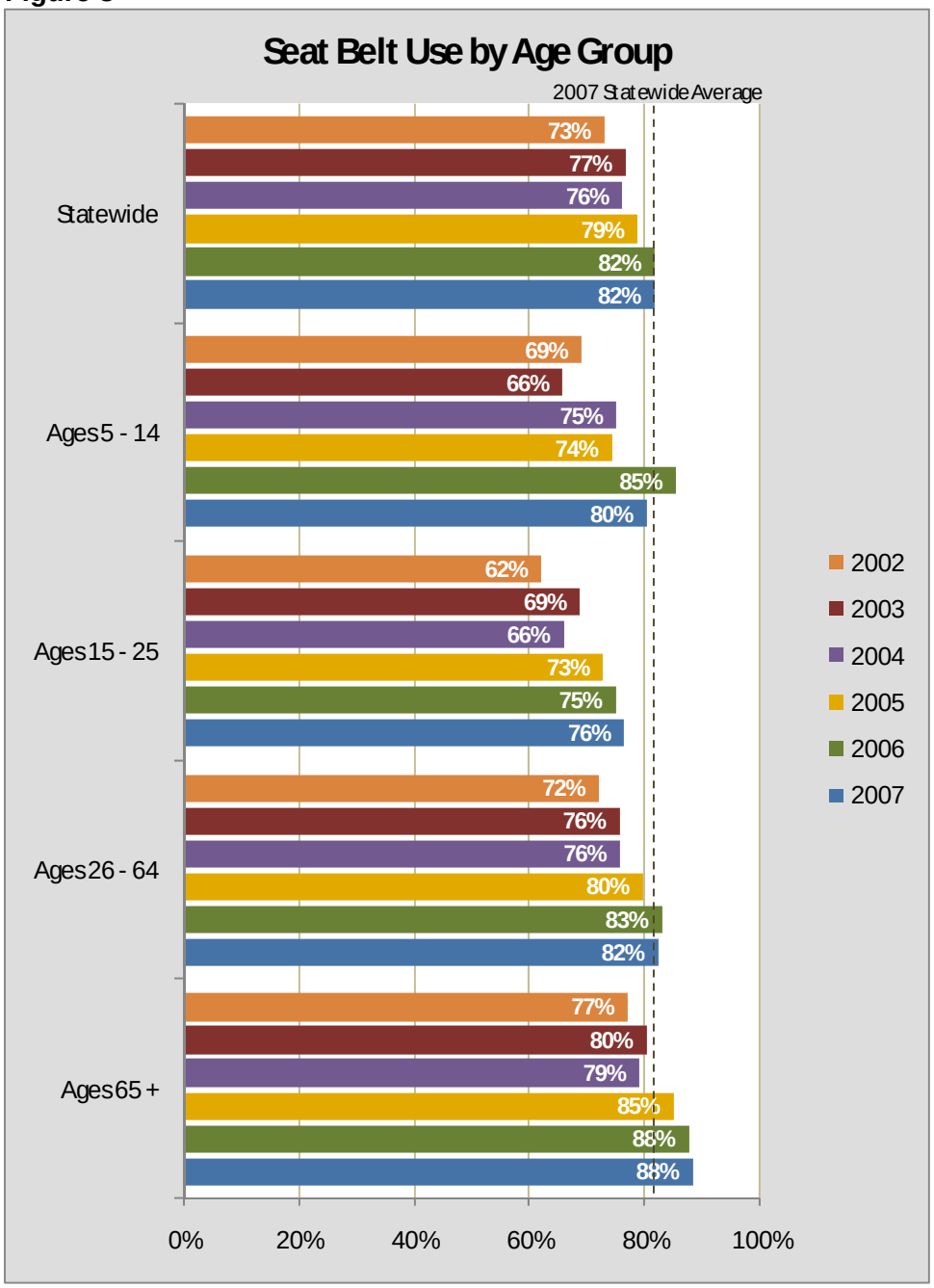
Table 13: Occupants 15-25 Years of Age		
Region	**Usage Rate**	**Unweighted N**
Central	79.80%	717
Northeast	74.34%	1,446
Northwest	76.65%	560
Southeast	71.35%	385
Southwest	78.61%	1,225
Statewide	**76.44%**	**4,333**

Table 14: Occupants 26-64 Years of Age		
Region	**Usage Rate**	**Unweighted N**
Central	82.70%	2,502
Northeast	82.17%	7,274
Northwest	80.84%	1,667
Southeast	81.67%	934
Southwest	82.83%	3,007
Statewide	**82.19%**	**15,384**

Table 15: Occupants 65+ Years of Age		
Region	**Usage Rate**	**Unweighted N**
Central	88.19%	468
Northeast	87.62%	1,101
Northwest	87.11%	322
Southeast	80.25%	183
Southwest	92.36%	546
Statewide	**88.21%**	**2,620**

Figure 8 (following page) shows that since 2002, occupants in the 15 to 25 age group (the highest risk group) improved their seat belt use by 14 percentage points, while occupants in the 5 to 14 age group increased their seat belt use by 11 percentage points. All age groups showed a marked increase in seat belt use (by 10 percentage points or greater).

Figure 8



Race of Vehicle Occupants and Seat Belt Use

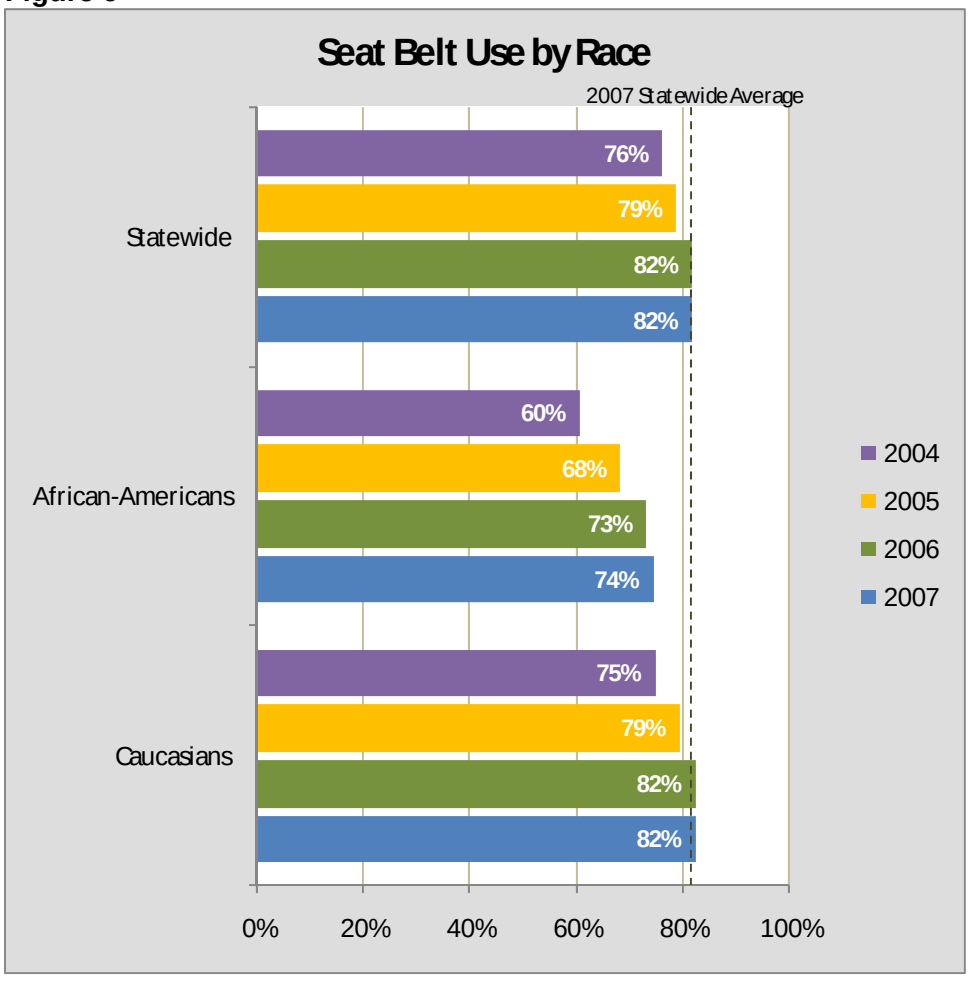
Beginning in 2004, the observation survey assessed seat belt use by race: Caucasian, African-American, and individuals of other races ("other"). The present observation methodology precluded the collection of more detailed race information. Therefore, these surveys provide data on seat belt use primarily by Caucasians and African-Americans. Also, due to demographic characteristics of Ohio and the difficulty of clearly determining race using the current methodology, the number of vehicle occupants identified as African-American was relatively small (975 vehicles and 1,154 occupants) and is probably an undercount. Mindful of these caveats, the overall statewide data are consistent with findings from other research (Shults et.al., 2004). Overall statewide seat

belt use among African-Americans (74%) is significantly lower than the 82% usage rate among Caucasians (Table 16). While there were too few African-American observations to generate reliable estimates for most of the other subgroup comparisons, the sizable disparity between African-American and Caucasian seat belt use persists and represents a significant highway safety issue.

Table 16: Seat Belt Use Rates by African-American and Caucasian Vehicle Occupants and Region				
Region	**African-American**	**Unweighted N**	**Caucasian**	**Unweighted N**
Central	76.24%	173	83.10%	3,529
Northeast	74.66%	481	82.04%	9,457
Northwest	69.09%	105	81.59%	2,495
Southeast	79.71%	28	78.84%	1,500
Southwest	73.65%	367	83.34%	4,474
Statewide	**74.30%**	**808**	**82.21%**	**21,455**

Figure 9, below, shows that seat belt use among African-Americans has increased progressively since data were first collected.

Figure 9



Observation Site Type and Seat Belt Use

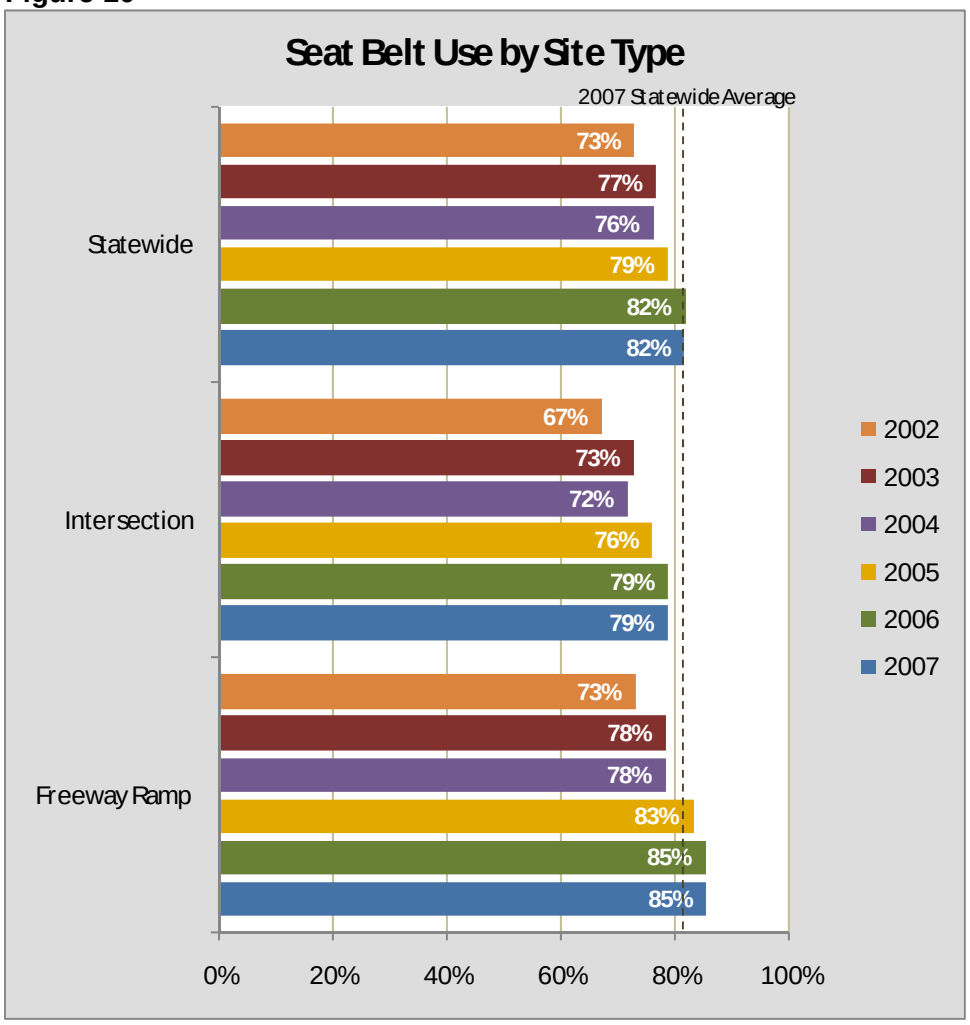
Historically, seat belt use has been higher on limited access roadways (i.e., interstates and expressways). To investigate whether this is still true, usage rates at intersections were compared to those observed at off-ramps. Usage rates were found to be higher on off-ramps compared to intersections, even in regions where overall use is low. This is consistent with the results of previous years' surveys, and is most likely due to the greater perceived risk associated with travel at higher speeds on limited access roadways. Table 17 summarizes the results for usage by observation site type.

Table 17: Usage Rates by Road Type

Region	Usage Rate	Unweighted N
Intersection	78.67%	15,175
Freeway Ramp	85.45%	7,698

As shown in Figure 10, during the past five years, seat belt use increased by similar percentages on freeway ramps and intersections. Seat belt use on freeway ramps remained substantially higher than at intersections during all four years.

Figure 10



Cross-tabulations of Observation Characteristics and Seat Belt Use

Tables 18 - 20 illustrate seat belt use rates based on several demographic, occupant, and vehicle characteristics. As indicated, male pickup truck drivers of ages 15-25 had the lowest usage rate of all drivers, while van/minivan drivers aged 65 years or older had the highest rate of all drivers. With many of the rates reported for passengers, each category had few observations, thus creating a large margin of error. Therefore, whether the rates are representative of the larger population is questionable. However, these rates do indicate that passengers of pickup trucks had relatively low usage rates, especially males.

Table 18: Driver and Passenger Usage Rates by Age and Sex

		Drivers	Unweighted N	Passengers	Unweighted N
Ages 15-25	Males	69.14%	1,575	70.51%	447
	Females	82.21%	1,671	76.51%	636
Ages 26-64	Males	78.70%	7,383	71.40%	614
	Females	87.20%	5,884	85.08%	1,494
Ages 65+	Males	86.79%	1,171	88.98%	184
	Females	89.04%	715	91.28%	549

Table 19: Driver and Passenger Usage Rates by Age and Vehicle Type

		Drivers	Unweighted N	Passengers	Unweighted N
Ages 15-25	Passenger Car	78.38%	2,250	74.18%	676
	Van / Minivan	85.15%	171	78.71%	108
	SUV	79.72%	465	77.56%	167
	Pickup Truck	60.52%	361	65.01%	134
Ages 26-64	Passenger Car	84.40%	6,673	83.56%	946
	Van / Minivan	84.65%	1,831	83.61%	379
	SUV	84.33%	2,646	79.20%	464
	Pickup Truck	71.03%	2,122	74.25%	325
Ages 65+	Passenger Car	90.18%	1,219	89.56%	462
	Van / Minivan	90.75%	232	92.91%	117
	SUV	88.74%	184	93.35%	94
	Pickup Truck	73.69%	251	90.23%	60

Table 20: Driver and Passenger Usage Rates by Sex and Vehicle Type

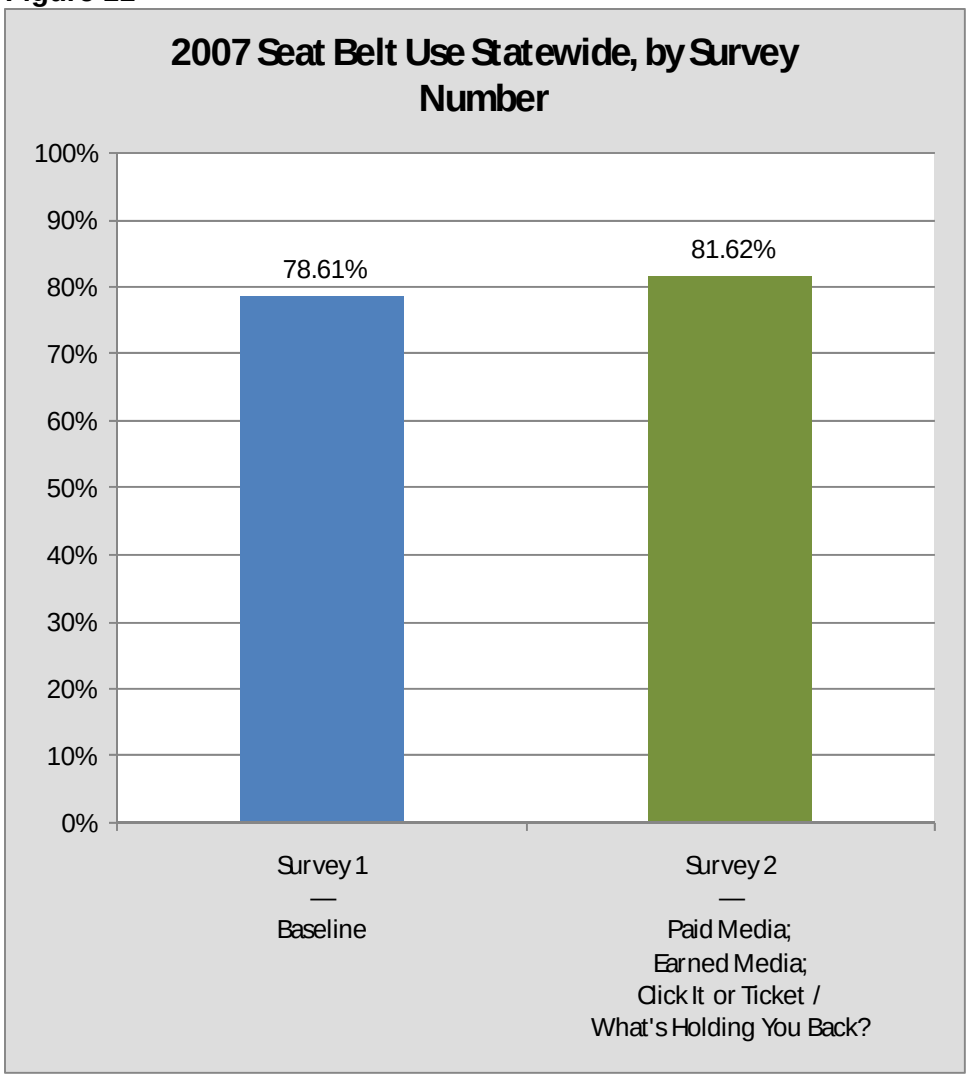
		Drivers	Unweighted N	Passengers	Unweighted N
Males	Passenger Car	81.34%	4,997	73.73%	749
	Van / Minivan	81.09%	1,101	82.36%	206
	SUV	80.93%	1,646	75.19%	277
	Pickup Truck	67.76%	2,388	70.05%	281
Females	Passenger Car	85.65%	5,147	83.76%	1,566
	Van / Minivan	90.29%	1,135	86.08%	503
	SUV	85.30%	1,648	84.04%	540
	Pickup Truck	82.97%	344	76.17%	325

Media and Enforcement Interventions

The 2007 Observational Seat Belt Study reports only results from the second observational survey which occurred after multiple interventions, including media campaigns and enforcement initiatives such as "*Click It or Ticket*" and "*What's Holding You Back*." Therefore it is useful to compare usage rates among Surveys 1 (Baseline) and 2, shown in Figure 11.

As shown below, statewide occupant seat belt use increased approximately 3 percentage points from Survey 1 to Survey 2. However, seat belt use has not increased appreciably from the previous year.

Figure 11



Conclusions

The 2007 observational survey has identified specific populations that warrant special attention because of their lower rates of seat belt use. These results are consistent with previous surveys, although usage rates overall, and in specific populations, have continued to increase. Due to the current absence of a primary seat belt law in Ohio, to increase overall seat belt use, significantly greater compliance with the present secondary seat belt law must occur among populations with relatively low rates of seat belt use. Hence, media and enforcement initiatives which promote greater seat belt use must be strengthened; ongoing, rather than periodic; and directed disproportionately at the following populations:

- Southeast region drivers and passengers
- Pickup truck drivers and passengers
- Male drivers and passengers
- Drivers and passengers ages 15-25

For instance, Williams and Wells (2004: 179) maintain that what is necessary in the United States to achieve seat belt use rates of 90% or greater is widespread, methodical, and sustained application of enforcement programs, augmented by the use of creative publicity.

Recommendations

The 2007 survey again increases and reaffirms knowledge about Ohioans who are and are not using seat belts. As derived from the survey, the following segments of the population have been identified as meriting special attention due to relatively low rates of seat belt usage. To increase seat belt use statewide, it is important to increase compliance among these segments.

1. Relative to the other regions in Ohio, the rural Southeast section of the state had the lowest usage rate, 78.9%, and continues to warrant special attention. Given that this region is mainly rural, its low use rate could be tied to the low use rate of pickup truck drivers and passengers. Therefore, campaigns in this region may do well to focus on this vehicle type. All other regions' rates are between 81% and 82% and could still stand to be improved in pursuit of the 85% use rate goal.

2. Vehicle occupants ages 15-25 continued to exhibit relatively low seat belt usage rates (76%), although this rate continues to improve yearly. The Southeast rate of 71% for occupants 15-25 is especially low compared to the remaining regions. Since motor vehicle crashes are the leading cause of death among people ages 15-20 (National Highway Traffic Safety Administration, 2005), increasing seat belt use among young drivers and passengers is especially crucial in helping to reduce Ohio's traffic-related fatalities and injuries. It may be worthwhile to model a campaign based on Minnesota's *Most of Us* campaigns for teen drivers to reduce drinking and driving by noting that "most" Ohio teens do wear seat belts.

3. In 2007, the seat belt use rate for vehicle occupants age 5-14 was 80%, 5 percentage points lower than in 2006. Due to the small number of occupants in this age range in individual regions, it is difficult to ascertain true trends for regions. While a very small number of occupants age 5-14 were observed, they have among the highest rates of injury in traffic crashes compared to other age groups. Therefore, it is important for passengers in the 5-14 age group to understand the importance of buckling up on their own, and not merely because the driver, parent, or another adult requests that they do so. Establishing an inherent motivation to buckle up among the age group should logically lead to increased seat belt usage when they reach driving age. Consequently, increasing seat belt use among youths is essential in helping to reduce traffic-related fatalities and injuries in Ohio. Ohio's initiatives to increase booster seat use among young children may also help this endeavor.

4. In general, male drivers and passengers are significantly less likely to wear seat belts as compared to females. For instance, during 2007, male driver and passenger seat belt usage rates were 79% and 75% respectively, while usage rates were 86% for female drivers and 84% for female passengers. Thus, messages designed to promote belt use should be directed specifically to males to increase awareness of the importance and legality of wearing a seat belt. Those messages should also emphasize the significance of wearing a seat belt both while driving and riding as a passenger.

5. As in previous years, pickup truck occupants are one of the most important groups on which to focus media and enforcement initiatives. These individuals, and especially male drivers and passengers of all ages generally have significantly lower usage rates than occupants of other vehicle types. For example, seat belt usage rate among male pickup truck drivers is 68% and, for male pickup truck passengers, 70%; in contrast, usage rates are 83% for female pickup truck drivers and 76% for female pickup truck passengers. The usage rate is also low for male pickup truck drivers and passengers ages 15 to 25. Overall, pickup trucks accounted for 15% of the vehicles observed during the survey. Based on the percentage of all registered vehicles in Ohio that are pickup trucks, the percent that are involved in fatal crashes, and the low compliance with Ohio's seat belt law among pickup truck occupants, this group is at higher risk for death or serious injury that could be possibly prevented by the consistent use of seat belts. Therefore, increasing seat belt use among pickup truck drivers and passengers, especially males, is significant to reducing Ohio's traffic-related fatalities and injuries.

6. During the 2007 survey, the statewide seat belt use rate among African Americans of 74% is significantly lower than the 82% usage rate among Caucasians. Although African Americans make up only 5% of occupants in the observational survey, due to the concentration of African Americans in Ohio's urban areas, 5% is probably an undercount. Nevertheless, correcting the low seat belt use of African Americans is of particular importance to the African-American community as, according to the National Center for Injury Prevention and Control, traffic accidents are the leading cause of death for black children and the second greatest cause of death among African Americans between the ages of 15 and 24 (Wald, 2000). Hence, culturally appropriate media and enforcement initiatives which promote greater seat belt use by the African-American community, and especially youth, should be increased.

7. Finally, it is strongly recommended that Ohio continues to pursue the passage of a primary seat belt law. Statewide surveys of representative samples of Ohio drivers show that the majority of drivers would favor a primary seat belt law for the state, would obey such a law, and believe a primary law would have a significant positive impact on highway safety in Ohio (Seufert et., al., 2003; 2004; 2005). Furthermore, studies indicate that a state can expect to experience a 15% increase in seat belt use with the passage of a primary seat belt use law. This may be particularly important in light of the fact that 2007 was the first year in which seat belt use stagnated or declined for many subsets of the sample.

In summary, action on the above recommendations through innovative and sustained media and enforcement initiatives directed disproportionately at "high risk" groups is necessary to achieve significantly higher seat belt use in Ohio. Adoption of a primary seat belt use law would greatly accelerate progress toward reaching a seat belt use rate of 85% or higher.

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Appendix A: Site Locations

Site No.	County	Region	Primary Site Location	Municipality or Township	Type
1	Delaware	CN	EB Center Village Rd. at SR-605	Harlem	I
2	Delaware	CN	EB Home Rd. at Dublin Rd. (SR-745)	Rathbone	I
3	Delaware	CN	EB E. Powell Rd. at S. Old State St.	Orange	I
4	Delaware	CN	WB W. Williams St. at S. Washington St.	Delaware	I
5	Delaware	CN	NB Liberty Rd. at Home Rd.	Liberty	I
6	Fairfield	CN	Harrison and W. Sixth St.	Lancaster	I
7	Fairfield	CN	SB N. Broad St. at W. Fifth Ave.	Lancaster	I
8	Fairfield	CN	NB SR-664 at SR-37	Rush Creek	I
9	Fairfield	CN	Diley Rd. NB at Long Rd.	Pickerington	I
10	Franklin	CN	SB Hendron Rd. at Main St.	Groveport	I
11	Franklin	CN	NB Demorest at Clime	Columbus	I
12	Franklin	CN	EB Southwest Blvd. at Demorest Rd.	Grove City	I
13	Knox	CN	SB South Market St. at Rambo St.	Danville	I
14	Knox	CN	EB Gambier Rd. at Edgewood Rd.	MT. Vernon	I
15	Knox	CN	NB SR-586 at US-62	Martinsburg	I
16	Knox	CN	EB Clayton at N. High St.	Centersburg	I
17	Licking	CN	NB SR-13 at US-40	Newark	I
18	Licking	CN	SB Jacksontown Rd. at US-40	Jacksontown	I
19	Licking	CN	WB Country Club Rd. at Granville Rd.	Newark	I
20	Licking	CN	WB Refugee Rd. at Outville Rd.	Harrison	I
21	Licking	CN	US-62 at SR-661 SB	Burlington	I
22	Marion	CN	WB Owens Rd. at Gooding Rd.	Pleasant	I
23	Marion	CN	NB SR-423 at CR-138-B (Barrs Rd.)	Marion	I
24	Marion	CN	EB SR-47 at SR-203	Prospect	I
25	Pickaway	CN	NB Nicholas Dr. at Northridge Rd. (SR-188)	Circleville	I
26	Pickaway	CN	WB US-22 at SR-104	Deer Creek	I
27	Pickaway	CN	CR-32 at CR-7	Walnut	I
28	Ashland	NE	EB Walnut St. at Center St.	Ashland	I
29	Ashland	NE	WB CR-658 at US-250	Village of Savannah	I
30	Ashland	NE	EB County Hwy. 1600 at County Hwy. 1095	Montgomery	I
31	Ashtabula	NE	SB SR-7 at US-322	Williamsfield	I
32	Ashtabula	NE	SB SR-45 at East Water St.	Rock Creek	I
33	Ashtabula	NE	WB East Main St. at Andover Square	Andover	I
34	Ashtabula	NE	SB Pymatuning at US-322	Williamsfield	I
35	Ashtabula	NE	WB E. Water St. at SR-45	Rock Creek	I
36	Ashtabula	NE	WB Eastwood at Centennial St.	Geneva	I
37	Ashtabula	NE	SR Elm Ave. at Center St.	Ashtabula	I
38	Columbiana	NE	SB Jennings Ave. at State St. (SR-173)	Salem	I
39	Columbiana	NE	SB St. Clair Ave. at McKinnon St.	E. Liverpool	I
40	Columbiana	NE	WB North St. at N. Market St. (SR-165)	E. Palestine	I
41	Columbiana	NE	NB Dresden (CR-447) at SR-170	St. Clair	I
42	Columbiana	NE	WB Cameron Rd. (CR-424) at SR-45	Madison Twp.	I
43	Columbiana	NE	WB McKinnon at St. Clair	E. Liverpool	I
44	Columbiana	NE	SB Park Way at Anderson Blvd.	E. Liverpool	I
45	Columbiana	NE	SB Beaver St. at Washington St. (SR-164)	Lisbon	I
46	Cuyahoga	NE	Egbert Rd. at Union St.	Bedford Hts.	I
47	Cuyahoga	NE	Drake Rd. WB at Pearl Rd.	Strongsville	I
48	Cuyahoga	NE	WB McCracken Blvd. at 98th St.	Garfield Hts.	I
49	Cuyahoga	NE	EB Emery at Brainard Rd.	Warrensville Hts.	I
50	Erie	NE	EB Mason Rd. at SR-61	Florence	I
51	Erie	NE	NB SR-61 at SR-113	Berlin	I
52	Erie	NE	SB Patten Tract Rd. at Mason Rd.	Oxford	I
53	Geauga	NE	WB Music St. at Hemlock Pt.	Russell	I
54	Geauga	NE	WB US-322 at SR-608	Claridon	I
55	Geauga	NE	WB SR-166 at SR-528	Thompson	I
56	Geauga	NE	WB Merritt at SR-44	Munson	I
57	Huron	NE	NB Section Line 30 at SR-547	Sherman	I
58	Lake	NE	EB Madison Rd. At SR-84	Perry	I
59	Lake	NE	WB Maple Group Rd. at Somrack Dr.	Lake	I
60	Lake	NE	WB Ohio Street at Reynolds Rd. (SR-306)	Mentor	I
61	Lake	NE	NB E 340th at Jennison St.	Eastlake City	I
62	Lake	NE	EB Blase-Nemeth at CR-305	Painesville	I
63	Lake	NE	WB Oakwood Blvd. at Hardy Dr.	Painsville	I
64	Lorain	NE	SB Root Rd. at Stations Rd.	Columbia	I
65	Lorain	NE	NB West Rd. at SR-18	Penfield	I
66	Lorain	NE	SB Oberlin Rd. at Cleveland Oberlin Rd.	New Russia	I
67	Lorain	NE	Ohio St. WB at Glenwood St.	Elyria	I

Site No.	County	Region	Primary Site Location	Municipality or Township	Type
68	Mahoning	NE	EB Boardman Canfield Ave. at E. Parkside Dr.	Boardman	I
69	Mahoning	NE	SR-46 SB at US-62	Canfield	I
70	Medina	NE	WB Outlet Mall Rd. at SR-83	Harrisville	I
71	Medina	NE	SR-162 WB at SR-94	Sharon center	I
72	Medina	NE	SR-42 NB at CR-76 (Hamilton Rd.)	Medina	I
73	Portage	NE	NB Walnut St. at Central Ave.	Ravenna	I
74	Portage	NE	WB Lynn Rd. at Rootstown Rd.	Rootstown	I
75	Portage	NE	SB Franklin Ave. at Cherry St.	Kent	I
76	Portage	NE	NB Sebring Johnson Rd. at SR-14	Deerfield	I
77	Richland	NE	SB Rock Rd. at Myers Rd.	Jackson	I
78	Richland	NE	EB Shelby-Ganges Rd. at CR-191	Jackson	I
79	Richland	NE	WB Marion Ave. at Home Rd.	Jackson	I
80	Stark	NE	Lincoln Way at 23rd St.	Massillon	I
81	Stark	NE	NB SR-44 at SR-619		I
82	Stark	NE	WB Farber at SR-800		I
83	Summit	NE	Steeles Corners Rd. EB at Wyoga Lake Rd.	Cuyahoga Falls	I
84	Summit	NE	WB Huston St. at Fifth St.	Barberton	I
85	Summit	NE	Memorial Parkway WB at North Portage Path	Akron	I
86	Summit	NE	Brown St. NB at Thornton St.	Akron	I
87	Summit	NE	S. Hametown Rd. NB at Minor Rd.	Copley Twp.	I
88	Summit	NE	Arlington Rd. SB at Moore Rd.	Green	I
89	Summit	NE	WB Carey Ave. at 26th St.	Akron	I
90	Trumbull	NE	NB High Ave. at E. Main St.	Cortland	I
91	Trumbull	NE	EB SR-305 at SR-193	Fowler Township	I
92	Trumbull	NE	EB Youngstown at Central Parkway	Warren	I
93	Wayne	NE	Schrock Rd. EB at South Elm St.	Orrville	I
94	Wayne	NE	NB Fredericksburg Rd. at US-250		I
95	Wayne	NE	EB CR-30A at US-250		I
96	Wayne	NE	NB Main St. at Sunset Dr.	Rittman	I
97	Wayne	NE	Milltown Rd. EB at Melrose Dr.	Wooster	I
98	Allen	NW	SB Yoakam Rd. at Zurmahly Rd.	Fort Shawnee	I
99	Allen	NW	WB Grand Ave. at Main St.	Lima	I
100	Allen	NW	SB Bentley at Augsburger Rd.	Bluffton	I
101	Auglaize	NW	WB Benton St. at Water St.	Wapakoneta	I
102	Auglaize	NW	SB SR-65 at SR-67	Uniopolis	I
103	Auglaize	NW	SB Defiance St. at Indiana Dr.	St. Marys	I
104	Auglaize	NW	SB SR-196 at SR-67	Waynesfield	I
105	Auglaize	NW	EB SR-67 at SR-65	Uniopolis	I
106	Crawford	NW	Popular St. at Mansfield St.	Bucyrus	I
107	Crawford	NW	SR-4 at SR-103	Chatfield	I
108	Hancock	NW	SB TR-234 at CR-205		I
109	Logan	NW	CR-24 at SR-47	Logansville	I
110	Logan	NW	CR-5 at SR-273	Rush Creek	I
111	Logan	NW	SR-117 at Napoleon St.	Richland	I
112	Logan	NW	NB US-33 at SR-540 (E. Sandusky Ave.)	Bellefontaine	I
113	Logan	NW	CR-60 at CR-24	Bloom Center	I
114	Lucas	NW	Nebraska Ave. at Holland-Sylvania Rd.	Toledo	I
115	Lucas	NW	WB Liberty St. at E. Broadway	Oregon	I
116	Sandusky	NW	SB SR-101 at CR-117	Green Creek Twp.	I
117	Sandusky	NW	NB South Tiffin Rd. at Hurdic Rd.	Ballville Twp.	I
118	Sandusky	NW	NB Church St. at Main St.	Helena	I
119	Sandusky	NW	EB Napoleon St. at Brush St.	Freemont	I
120	Seneca	NW	SB CR-15 at CR-38	Pleasant Twp.	I
121	Shelby	NW	EB Ft. Loramie-Swanders Rd. at SR-29		I
122	Shelby	NW	EB Russell Rd. at Fourth Ave.	Sidney	I
123	Shelby	NW	SB SR-66 at SR-705	Ft. Loramie	I
124	Wood	NW	WB Rees Rd. at Lemoyne Rd.		I
125	Athens	SE	EB US-50 at SR-32	Lee	I
126	Belmont	SE	CR-56 WB at SR-9	Richland	I
127	Belmont	SE	Marietta St. NB at Main St.	St. Clairsville	I
128	Jefferson	SE	NB Standard at McLister Ave.	Mingo Junction	I
129	Jefferson	SE	SR-22 at John Scott Hwy.	Steubenville	I
130	Jefferson	SE	NB Lovers Lane at CR-43	Steubenville	I
131	Lawrence	SE	SR-243 at SR-378	Union	I
132	Muskingum	SE	SB Piketon Rd. at Maysville	Newton Twp.	I
133	Tuscarawas	SE	Walnut St. at Main St.	Gnadenhutten	I

Site No.	County	Region	Primary Site Location	Municipality or Township	Type
134	Tuscarawas	SE	Gilmore Rd. at CR-14		I
135	Washington	SE	CR-375 WB at SR-821		I
136	Washington	SE	Washington St. EB at 3rd St.	Marietta	I
137	Butler	SW	US-27 at Hamilton-New London Rd.	Ross Twp	I
138	Butler	SW	SB Breiel Blvd. at Roosevelt Blvd.	Middletown	I
139	Butler	SW	SB Wycoff St. at Roosevelt Blvd.	Middletown	I
140	Butler	SW	WB SR-747 at SR-4		I
141	Butler	SW	SB Brofield Dr. at Bay Berry Dr.	Indian Springs	I
142	Butler	SW	WB Todhunter Rd. at Yankee Rd.	Monroe	I
143	Butler	SW	EB Minton Rd. at Boyle Rd.	Hanover Twp.	I
144	Clark	SW	Santa Monica at Red Coach Dr.	N. Estates	I
145	Clark	SW	NB US-68 at Fairfield Pike	Springfield	I
146	Clark	SW	WB SR-40 at SR-571	New Carlisle	I
147	Clermont	SW	WB SR-756 at SR-133	Felicity	I
148	Clermont	SW	SB Laurel Lindale at Bethal New Richmond	Franklin	I
149	Clermont	SW	SR-222 at SR-133	Franklin	I
150	Clermont	SW	Brooklyn Ave. at SR-28	Millford	I
151	Darke	SW	N. Broadway St. at Main St.	Greenville	I
152	Darke	SW	SR-118 at SR-47	Ansonia	I
153	Montgomery	SW	EB Wyoming at Wayne Ave.	Dayton	I
154	Montgomery	SW	WB Farmersville Pk. at Elm St.	Farmersville	I
155	Miami	SW	WB Broadway at High St.	Covington	I
156	Miami	SW	EB SR-571 at SR-48	W. Milton	I
157	Greene	SW	NB Col. Glenn Hwy. at Ravenwood Dr.	Fairborn	I
158	Greene	SW	US-42 SB at Main St.	Xenia	I
159	Greene	SW	SB Colorado Dr. at Alabama Dr.	Xenia	I
160	Greene	SW	WB Brown Rd. at Wilmington Pk.	Sugarcreek	I
161	Hamilton	SW	WB Losantiville Rd. at Wiehe Rd.	Golf Manor	I
162	Hamilton	SW	SB Woodland Ave. at Madison Rd.	Oakley	I
163	Hamilton	SW	EB Fleming at Grandview Ave.	Cincinnati	I
164	Hamilton	SW	EB Hunley Rd. at Royalgreen Dr.	Anderson Twp.	I
165	Hamilton	SW	NB Race Rd. at West Fork Rd.	Cheviot	I
166	Hamilton	SW	EB Waycross Rd. at Hanover Rd.	Forest Park	I
167	Hamilton	SW	NB Shakerdale Rd. at Montgomery Rd.	Montgomery	I
168	Hamilton	SW	WB Hanley Rd. at Sheed Rd.	Colrain Township	I
169	Miami	SW	EB SR-55 at SR-589	Casstown	I
170	Miami	SW	WB Main St. at Fourth St.	Tipp City	I
171	Miami	SW	Washington St. at SR-66	Piqua	I
172	Miami	SW	WB US-40 at SR-201	Bethel	I
173	Miami	SW	SB SR-202 at SR-41	Troy	I
174	Miami	SW	NB Main St. at W. Hayes	S. Milton	I
175	Montgomery	SW	EB Leo St. at Webster St.	Dayton	I
176	Montgomery	SW	SB Wilmington Ave. at Citation Ave.	Dayton	I
177	Preble	SW	NB Commerce St. (SR-503) at Dayton St.	Lewisburg	I
178	Ross	SW	WB Second St. at High St.	Chillicothe	I
179	Ross	SW	EB Kellen Berger Rd. at Oar Rd.	Green	I
180	Ross	SW	SB Biers Run Road. At CR-550	Union	I
181	Ross	SW	WB SR-372 at US-23	Franklin	I
182	Ross	SW	SB Cattail Rd. at Egypt Pike	Union	I
183	Warren	SW	SB Pleasant St. at Columbus Ave.	Lebanon	I
184	Delaware	CN	I-71 at SR-36	Berkshire	OR
185	Franklin	CN	I-71 NB at Morse Rd.	Columbus	OR
186	Franklin	CN	SR161 EB New Albany Rd.		OR
187	Franklin	CN	EB SR161 at Little Turtle Way.	Columbus	OR
188	Franklin	CN	I-71 NB at Greenlawn Rd.	Columbus	OR
189	Franklin	CN	SR-270 SB at Roberts Rd.	Columbus	I
190	Franklin	CN	SR-104 WB at Groveport Rd.	Columbus	OR
191	Franklin	CN	NB SR315 at Ackerman Rd.	Columbus	OR
192	Geauga	NE	US-422 WB at SR-44	Russell Twp.	I
193	Greene	SW	I-675 NB at Dayton Yellow Springs Rd.	Fairborn	OR
194	Greene	SW	I-675 SB at N. Fairfield Rd.		OR
195	Hamilton	SW	SR-126 WB at Galbraith Ave.	Springfield Twp.	OR
196	Hamilton	SW	I-71 SB at Edwards Rd.	Norwood	OR
197	Hamilton	SW	I-275 EB at US-127	Colerain	OR
198	Hamilton	SW	I-275 NB at Sharon Rd.	Sharonville	OR
199	Hamilton	SW	NB I-275 at US-42	Sharonville	OR

Site No.	County	Region	Primary Site Location	Municipality or Township	Type
200	Hamilton	SW	I-71 NB at Mason-Montgomery Rd.	Symmes Twp.	OR
201	Hancock	NW	I-75 SB at SR-103		OR
202	Hancock	NW	I-75 NB at US-224	Findlay	OR
203	Jefferson	SE	SR-7 at SR-151		OR
204	Lake	NE	SR-2 WB at 305th St.	Willowick	OR
205	Lake	NE	I-90 EB at SR-306		OR
206	Lake	NE	EB SR-2 at SR-306	Mentor	OR
207	Licking	CN	SR-158 at I-70	Kirkersville	OR
208	Licking	CN	EB SR-16 at 21st St.	Newark	OR
209	Licking	CN	SR-16 WB at O'Bannon Ave.	Newark	OR
210	Logan	NW	US-33 at SR-540	Bellefontaine	OR
211	Lorain	NE	I-90 WB at SR-83	Avon	OR
212	Lorain	NE	EB SR-2 at Oak Point Rd.	Amherst	OR
213	Lorain	NE	WB SR-10 at SR-83		OR
214	Lucas	NW	SB I-75 at Willy's Parkway	Toledo	OR
215	Lucas	NW	NB I-280 at Manhattan St.	Toledo	OR
216	Lucas	NW	SB I-475 at Salisbury Rd.	Maumee	OR
217	Mahoning	NE	SR-11 NB at CR-18	Austintown Twp.	OR
218	Mahoning	NE	I-680 NB at Meridian Rd.	Austintown Twp.	OR
219	Mahoning	NE	SR-45 NB at Mahoning Ave.	Jackson Twp.	I
220	Marion	CN	US-23 NB SR-309		OR
221	Medina	NE	I-71 NB at SR-3	Medina Twp.	OR
222	Miami	SW	SB I-75 at SR-55	Troy	OR
223	Miami	SW	I-75 SB at US-36	Piqua	OR
224	Montgomery	SW	I- 75 NB at Benchwood Rd.		OR
225	Montgomery	SW	I- 75 NB at Leo St.	Dayton	OR
226	Montgomery	SW	I-675 SB at Wilmington Pk.		OR
227	Montgomery	SW	US-40 EB at Peters Pk.	Vandalia	OR
228	Montgomery	SW	SB I-75 at US-40		OR
229	Montgomery	SW	I-70 WB at SR-48	Englewood	OR
230	Muskingum	SE	I-70 WB at Underwood	Zanesville	OR
231	Richland	NE	EB US-30 at Spring Mill St. (SR-39)	Mansfield	OR
232	Scioto	SW	US-52 at SR-522		I
233	Stark	NE	SR-21 at SR-93		OR
234	Stark	NE	US-30 at SR-627 (Richville Dr.)		OR
235	Stark	NE	US-62 WB at SR-46		OR
236	Summit	NE	I-76/ US-224 EB at Cleveland-Massillon Rd.	Norten	OR
237	Summit	NE	I-271 NB at SR-303	Boston Twp.	OR
238	Trumbull	NE	W. Market at N. Leavitt	Warren Twp.	I
239	Trumbull	NE	SR-11 NB at Tibbetts-Wick Corners Rd.		OR
240	Trumbull	NE	SB-11 NB at SR-305		OR
241	Trumbull	NE	WB I-80 at SR-193		OR
242	Tuscarawas	SE	I- 77 at US-36		OR
243	Warren	SW	SB-71 at SR-741		I
244	Washington	SE	I-77 NB at CR-301 (Exit 16)		OR
245	Wayne	NE	SR-83 at SR-3	Wooster	OR
246	Wood	NW	NB I-75 at US-6		OR
247	Wood	NW	I-75 NB at Eagleville Rd.		OR
248	Allen	NW	EB US-30 at Lincoln Hwy.		I
249	Allen	NW	WB Lincoln Hwy. at SR-65		OR
250	Ashland	NE	WB US-30 at SR-60		OR
251	Ashtabula	NE	SR-11 at US-20	Ashtabula	OR
252	Ashtabula	NE	SR-11 at SR-307		OR
253	Athens	SE	SR-682 at Richland Ave.	Athens	I
254	Auglaize	NW	SB I-75 at Wapak-Fisher Rd.	Wapakoneta	OR
255	Belmont	SE	I-70 WB at SR-331		I
256	Clark	SW	NB US-68 at County Line Rd.	New Carlisle	OR
257	Clark	SW	EB I-70 at SR-54	S. Vienna	OR
258	Columbiana	NE	SR-11 NB at SR-344		OR
259	Columbiana	NE	EB US-30/ SB SR-11 at E. Liverpool Rd.	St. Clair Twp.	OR
260	Crawford	NW	WB US-30 at SR-4	Bucyrus	OR
261	Cuyahoga	NE	EB I-480 at SR-94	Parma	OR
262	Cuyahoga	NE	I-71 SB at SR-82 WB	Strongsville	OR
263	Cuyahoga	NE	I-480 WB at SR-252	N. Olmsted	I
264	Cuyahoga	NE	I-90 EB at SR-252	Westlake	OR
265	Darke	SW	US-36 at SR-49		OR

Appendix B: Site Description Form[12]

Statewide Safety Belt Survey – Site Description Form – 2007

Site No: _____ **Site Location:** _____

Observer Name: _____

Date: _____ **County:** _____ **City:** _____

Day of Week: ○ Monday ○ Tuesday ○ Wednesday ○ Thursday ○ Friday ○ Saturday ○ Sunday

Start Time: _____ **(military)**

End Time: _____ **(military)**

Interruptions: _____ **(total number of minutes)**

Weather:
- ○ Sunny/Mostly Sunny
- ○ Cloudy/Mostly Cloudy
- ○ Light Rain
- ○ Heavy Rain
- ○ Snow
- ○ Other _____

Visibility:
- ○ Poor
- ○ Satisfactory
- ○ Excellent

Site:
- ○ Primary
- ○ Alternate
- ○ Other _____

Site Type:
- ○ Intersection
- ○ Freeway Ramp

Description of Observation Location:

_____

_____

_____

_____

_____

First Traffic Count (5 min):_____

Second Traffic Count (5 min): _____

Draw diagram of site and indicate location and lane observed in the space below.

Total number of lanes at site in direction being observed

○1 ○2 ○3 ○4 ○5 ○6 ○7 ○8

Observer Comments:

_____

_____

_____

_____

_____

[12] Electronic versions of Site Description and Data Collection forms were used in PDAs.

Appendix C: Data Collection Form

ODPS – Data Collection Form - 2007

SITE NO:_____ **PAGE _____ OF _____**

VEHICLE TYPE	
1 ○	Passenger Car
2 ○	Van/Minivan
3 ○	SUV
4 ○	Pickup Truck
DRIVER	
1 ○	Belted Correctly
2 ○	Belted Incorrectly
3 ○	Unbelted
(GENDER)	
0 ○	Male
1 ○	Female
(AGE)	
1 ○	15 – 25
2 ○	26 – 64
3 ○	65 +
(RACE)	
1 ○	Caucasian
2 ○	African American
3 ○	Other
FRONT RIGHT PASSENGER	
1 ○	Belted Correctly
2 ○	Belted Incorrectly
3 ○	Unbelted
4 ○	Child (under age 4, under 40lbs.) in Safety Seat
5 ○	Child (under age 4, under 40lbs.) Belted
6 ○	Child (under age 4, under 40lbs.) Unbelted
(GENDER)	
0 ○	Male
1 ○	Female
(AGE)	
1 ○	0 – 4
2 ○	5 – 14
3 ○	15 – 25
4 ○	26 – 64
5 ○	65 +
(RACE)	
1 ○	Caucasian
2 ○	African American
3 ○	Other

VEHICLE TYPE	
1 ○	Passenger Car
2 ○	Van/Minivan
3 ○	SUV
4 ○	Pickup Truck
DRIVER	
1 ○	Belted Correctly
2 ○	Belted Incorrectly
3 ○	Unbelted
(GENDER)	
0 ○	Male
1 ○	Female
(AGE)	
1 ○	15 – 25
2 ○	26 – 64
3 ○	65 +
(RACE)	
1 ○	Caucasian
2 ○	African American
3 ○	Other
FRONT RIGHT PASSENGER	
1 ○	Belted Correctly
2 ○	Belted Incorrectly
3 ○	Unbelted
4 ○	Child (under age 4, under 40lbs.) in Safety Seat
5 ○	Child (under age 4, under 40lbs.) Belted
6 ○	Child (under age 4, under 40lbs.) Unbelted
(GENDER)	
0 ○	Male
1 ○	Female
(AGE)	
1 ○	0 – 4
2 ○	5 – 14
3 ○	15 – 25
4 ○	26 – 64
5 ○	65 +
(RACE)	
1 ○	Caucasian
2 ○	African American
3 ○	Other