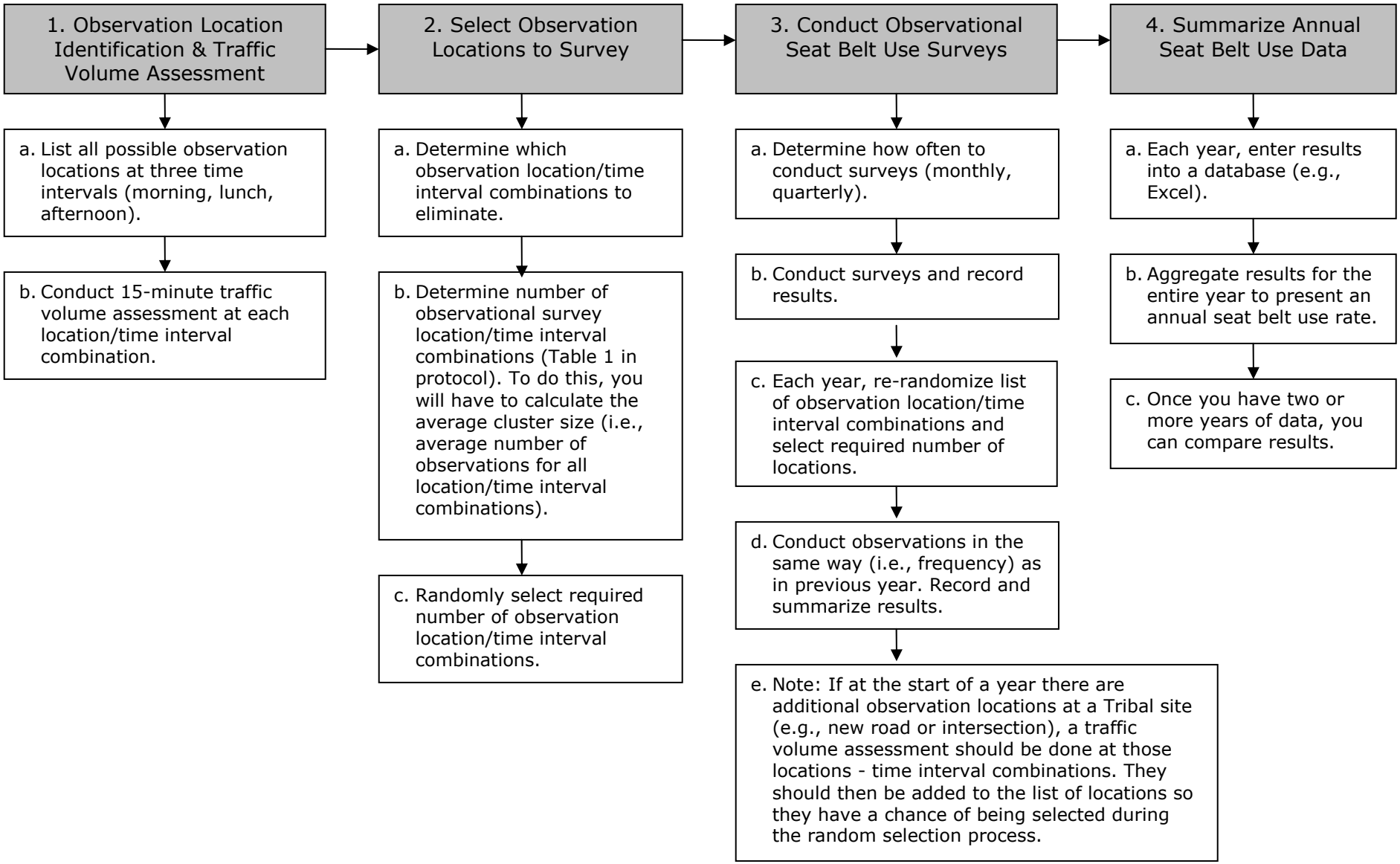
Flowchart of Seat Belt Observational Survey Protocol Key Steps



Background

American Indians/Alaska Natives (AI/AN) have the highest unintentional injury and suicide rates in the United States (National Center for Injury Prevention and Control [NCIPC], 1998). Motor vehicle crashes, which represented the eighth leading cause of death for all ages in 2002, are the third leading cause of death for American Indians/Alaska Natives. In addition, AI/AN mortality due to motor vehicle crashes is 3.3 times greater than that of the entire US population (*Regional Differences in Indian Health 1998-1999).*

Nationwide efforts to systematically address motor vehicle safety have been underway since the 1960s, when unintentional injuries caused 93,803 deaths with 41 percent associated with motor-vehicle crashes (Centers for Disease Control [CDC], 1999). Since 1981, the Indian Health Service has supported activities that assist in preventing injuries to American Indian/Alaska Natives (Smith & Robertson, 2000). The Centers for Disease Control and Prevention (2001) have outlined guidelines for addressing motor-vehicle occupant injury through the increased use of child safety seats, safety belts, and reducing alcohol-impaired driving.

Introduction

In April 2001, faculty and staff from the University of North Carolina (UNC) School of Public Health Department of Health Behavior and Health Education and the Injury Prevention Research Center were awarded a five-year contract from the Indian Health Service Injury Prevention Program to provide on-going monitoring, technical assistance, and training services to Tribes/Tribal Organizations funded for five-year cooperative agreements as part of the IHS Tribal Injury Prevention Cooperative Agreements Program (TIPCAP). In Year II of UNC's contract (April 2002-2003), UNC staff developed site-specific technical assistance tools for several programs. Two of the tools developed included a seat belt observational survey form and accompanying Microsoft Excel spreadsheet files that enable coordinators to more easily enter, summarize, and chart seat belt observational survey results. By fall 2003, 75 percent (n=24) of the Tribal communities supported through the TIPCAP were conducting seat belt observational surveys.

As an outgrowth of the on-going technical assistance provided by UNC (i.e., site visits, conference calls, and progress report reviews) to IHS and Tribal staff associated with TIPCAP, UNC faculty and staff noted considerable variability in the methods used to collect seat belt use data by TIPCAP communities. UNC faculty and staff proposed to conduct a Project to develop and pilot-test a seat belt use observational survey protocol among several Tribal communities participating in TIPCAP. In 2003, IHS awarded UNC a contract to implement the Seat Belt Observational Survey Protocol Development Project that examined statistical and programmatic implications of observational location selection by IHS programs in the estimation of seat belt use by American Indian populations.

Based on findings from the Seat Belt Observational Survey Protocol Development Project, UNC has revised the Protocol. This document organizes the revised protocol into the following four sections:

1. Observation Location Identification and Traffic Volume Assessment
2. Selecting Observation Locations to Survey
3. Conducting Observational Seat Belt Surveys
4. Summarize Annual Seat Belt Use Data

If you have any questions about how to use the protocol, survey, or Excel file, please contact either Molly Cannon at 919-966-9768 (mcannon@email.unc.edu) or Robert Letourneau at 919-966-3920 (robert_letourneau@unc.edu).

1. Observation Location Identification and Traffic Volume Assessment

The general principle of conducting observational seat belt surveys is to conduct enough observations so that the results are representative of seat belt use within an identified community. You want your observed "use rates" to be valid and represent an accurate estimate of actual seat belt use in your community. However, it is almost impossible to observe the entire community. Therefore, the "sampling methodology" provided here asks you to systematically survey a portion of the community to obtain results that represent the entire community's seat belt usage.

To capture seat belt usage from a variety of motorists, it is best to select multiple observation locations and conduct observations at those locations at different times of the day. Selection of multiple locations and observations at different times of the day will reduce bias and provide a valid "snap-shot" of seat belt use throughout the community.

The following three steps will guide you through the process of identifying possible observational survey locations in your community. Please review these steps and use the accompanying Observation Location Identification Worksheet to complete steps 1 and 2 using information about your Tribal community. When conducting the observation location identification and traffic volume assessment, be sure to conduct it during a 'typical' time of year for your community (e.g., not during peak tourist time or during the holiday season). For each of the steps outlined, an example is provided to highlight how to complete each step. While our examples only include four observation locations, the number of observation locations you identify will vary (i.e., most Tribal communities will identify more than four).

Step One – List All Possible Observation Locations

In this step, you will create a list of all possible road/street intersections in your community or communities, selecting only those intersections that meet **all** of the following criteria:

a. Locations where traffic comes to a stop (e.g., stop signs, traffic lights);
b. Locations that ensure the safety of an observer (e.g., **not** on a narrow road shoulder);
c. Locations where the observer may be located at an elevation equal to or higher than the vehicle being observed; and
d. Locations where local residents, rather than tourists, are likely to be observed.

We suggest that you use a map if available to identify all of the possible road/street intersections that fit these criteria in your community. Note: It does not matter how you list the locations (e.g., alphabetically, from East to West, or randomly).

Step One Example

Observation Locations
1. Rt. 1&7 Intersection
2. Post office & Rt. 6
3. Main St./Rt. 57
4. Rt. 6 & 9 Intersections

Step Two – Determine Traffic Volume

In this step, you will determine the traffic volume for each observation location using pre-defined time intervals: morning (7:00 – 9:00 am); lunch (11:30 am – 1:30 pm); and afternoon (4:30 – 6:30 pm). For the afternoon time interval, you may want to modify the end time (e.g., end at 5:45 pm) to ensure that it is still light enough to observe vehicles. Regardless of what end time you choose, try to be consistent with that time. Remember to conduct the traffic volume assessment during a 'typical' time of year (e.g., not during peak tourist time or during the holiday season).

To determine traffic volume on a normal weekday, you will count the number of vehicles you observe at each location for each time interval for approximately 15 minutes (see the third column below for examples). *Note: Only count vehicles that are traveling in one direction at each location.* For each location and time interval, indicate the start time and end time when you determined traffic volume. Calculate the anticipated traffic flow for a 60 minute period (e.g., if 20 vehicles were observed in 15 minutes, multiply 20 by 4 to come up with 80 potential observations in a 60-minute period). See the fourth column below for additional examples. Ideally, it is best to conduct the traffic volume assessment for 30 minutes and multiply it by two to obtain the 60-minute traffic volume. However, this may be unrealistic for communities with many observation locations, thus we are recommending the 15-minute assessment period (in this case, use Observation Location Identification Worksheet A). If, however, your community has ten locations or less, it is better to conduct the assessment for 30 minutes (in this case, use Observation Location Identification Worksheet B).

Step Two Example

Observation Locations	**Time Interval**	**Assessing 15-minute Traffic Volume**			**60-minute Traffic Volume** *(15 minute traffic volume * 4)*
		(# of vehicles observed in 15 minutes)	*Start Time*	*End Time*	
1. Rt. 1&7 Intersection	Morning	10	7:00 am	7:15 am	40
	Lunch	20	11:30 am	11:45 am	80
	Afternoon	10	4:30 pm	4:45 pm	40
2. Post office & Rt. 6	Morning	15	7:40 am	7:55 am	60
	Lunch	25	12:10 pm	12:25 pm	100
	Afternoon	35	5:10 pm	5:25 pm	140
3. Main St./Rt.57	Morning	10	8:20 am	8:35 am	40
	Lunch	5	12:50 pm	1:05 pm	20
	Afternoon	4	5:50 pm	6:05 pm	16
4. Rt. 6 & 2 Intersection	Morning	25	9:00 am	9:15 am	100
	Lunch	13	1:30 pm	1:45 pm	52
	Afternoon	20	6:30 pm	6:45 pm	80

2. Selecting Observation Locations to Survey

To determine the final list of observation locations from which to choose, you will follow three steps. Step one involves determining which observation locations to exclude. Step two involves determining the total number of observation locations required to obtain precise estimates of community seat belt use. Step three involves randomly selecting observation locations from the list of remaining possible locations. Please review these steps and use the accompanying Selecting Observation Locations Worksheet to complete steps 1 and 2.

Step One – Exclude Observation Locations

While it is important to conduct observations at all types of locations (e.g., with high and low traffic volume), it is recommended to exclude observation locations where traffic volume is very low. As a starting point, you should consider excluding observation locations that have 50 or fewer observations in a 60-minute period (based on the traffic volume assessment). However, if excluding these locations eliminates more than 20% of all of the locations, then you should change your exclusion criteria to the

next lowest category (i.e., 25 or fewer observations). Otherwise, you will be eliminating too many locations and the sample will not adequately reflect seat belt use in the population.

In the step two example above, five location/time-interval combinations had less than 50 observations in a 60-minute period (i.e., 40, 40, 40, 20, and 16). This represents 41.6% of all the observation locations (5 out of 12 = .416 times 100 = 41.6). Since this would eliminate more than 20% of the locations, go to the next lowest category and eliminate those with 25 or fewer observations. This would eliminate only two location/time-frame combinations (i.e., Main St./Rt. 57 - Lunch and Main St./Rt. 57 - Afternoon) which represents 17% of all the observation locations (2/12=.166).

If most/almost all of your observation location/time interval combinations have fewer than 25 observations, then do not exclude any of the combinations.

Step Two – Determine Required Number of Observation Locations

Step one involves determining the total number of locations to be observed on an annual basis. To do this, calculate the average number of observations for all locations listed that were not excluded in step one. In the example above, there were 40, 80, 40, 60, 100, 140, 40, 100, 52, and 80 observations (excluding the observations for Main St./Rt. 57 - Lunch and Main St./Rt. 57 – Afternoon), giving an average of 73 observations per location.

Refer to Table 1 to determine the total number of observation locations required for annual seat belt surveys. With an average cluster size of 73 observations, you would need to conduct observations at 28 locations throughout the year.

If you do not have as many location/time interval combinations as required by Table 1, you should still conduct as many observations as the Table indicates, even though this will mean conducting observations at the same location more than once. To do this, it will be important for you to conduct the observations at all locations, and then *randomly* select the additional locations from your list of all locations. For example, if Table 1 indicates that you should conduct observations at 28 location/time interval combinations over the course of a year, but you only have 21 observation location/time interval combinations identified during the traffic volume assessment (seven locations x three time intervals), you will need to conduct observations at all 21 of those locations, as well as at an additional seven locations. To identify your additional seven locations, you will randomly select the first seven from the list of all locations (see next page for how to randomly select locations).

If you do not have a minimum average cluster size of 20, it is advisable to consult with a statistician (e.g., through a University, Tribal Epidemiology Centers) to determine the required number of observation locations.

Table 1. Number of Observation Location/Time Interval Combinations Needed by Average Cluster Size.

Average Cluster Size (average number of vehicles observed)	# of Observation Location/Time Interval Combinations
20-29	41
30-39	35
40-49	32
50-59	30
60-79	28

Average Cluster Size (average number of vehicles observed)	# of Observation Location/Time Interval Combinations
80-99	27
100-129	26
130-199	25
200 and over	24

Step Three – Randomly Select Observation Locations[1]

Step two involves randomly selecting which of the locations by time of day you will want to observe. It is recommended to use a spreadsheet (e.g., Excel) to list each location three times (for each time period), unless they were excluded in step one. The spreadsheet for the previous example would look like this (excluding the observations for Main St./Rt. 57 - Lunch and Main St./Rt. 57 – Afternoon):

Location	Timeframe
1. Route 1 and 7 Intersection	Morning
2. Route 1 and 7 Intersection	Lunch
3. Route 1 and 7 Intersection	Afternoon
4. Post Office and Route 6	Morning
5. Post Office and Route 6	Lunch
6. Post Office and Route 6	Afternoon
7. Main Street and Route 57	Morning
8. Route 6 and 2 Intersection	Morning
9. Route 6 and 2 Intersection	Lunch
10. Route 6 and 2 Intersection	Afternoon

You are now ready to randomly select the total number of observation locations required to survey for the year. It is necessary to use a random number table or generator to select these locations. There are three ways to randomize the observation locations, choose the one that is the most convenient for you:

i. If a random number table is used, chose a random point in the table and pull numbers with sufficient digits to include the total number of locations in the traffic volume. For example, if there are 72 traffic volume locations on traffic flow, then choose 2 digit numbers from the random number tables; if there are 125 traffic volume locations choose 3 digit numbers from table. Assign the first random number selected from the table to the first observation location and continue until all locations have a random number. Select in order from the smallest to the largest random number the needed number of locations based upon Table 1. In the event of a tie, select both locations if you have not selected the required number of locations. If the tie occurs on the last selected location, flip a coin to choose between the two locations.

ii. Another method uses a random number generator available on the Internet at http://www.saccenti.com/randomnumber/randomnumber.htm. This is a free random number generator that will provide you with a random number between 1 and a number that you enter. Enter the total number of locations on the first line and enter the random number on your first location. It does not really matter how your locations are initially ordered. Once all locations have a random

[1] If you have the same number of observation location/time interval combinations as required by Table 1, then you do not need to randomly select them. Instead, you will conduct observations at all of those location/time interval combinations.

number, select in order from the lowest random number to the highest until you have reached your desired number of locations. Again, in the event of a tie, select both locations until you reach the desired number of locations. If you encounter a tie on your last selection, flip a coin to choose between the last 2 locations.

iii. The easiest method of selection requires the availability of Excel. Other spreadsheet packages may also have this function. It would probably be useful to have entered details of each observation location into the Excel file. At a minimum, there should be a file with a sequential number from 1 to the total number of possible observation locations. In the next cell over from observation location 1 enter a formula by typing the equals sign =. Next type "rand()" and hit enter. A random number will be generated. Move the cursor to the lower right hand corner of the cell over a small solid square. The cursor will change to a solid + sign. Click and hold the right mouse button and pull the plus sign down over all cells adjoining a sequential number and let the mouse go at the end of the list. There should be one random number on each row. Next, sort the list of observation locations by the random number. Highlight all the entries on your spreadsheet. Click the pull down menu at the top of the spreadsheet for Data and highlight sort. Click the top sort by box and highlight the column that includes your random numbers. The list will sort from the lowest to the highest random number. The random numbers will change, so do not be alarmed. You should see that the order of the observational locations changed. Take the observation locations in order from the first until you reach the total number of locations needed.

3. Conducting Observational Seat Belt Surveys

Now that the list of observational locations has been identified, you can begin conducting observational seat belt surveys at those locations. It is recommended that you conduct observations for 60-minutes. It is not recommended to set the criteria based on number of vehicles observed (e.g., observe until you see 100 vehicles) as there will not be an equal probability of vehicles being sampled. This would bias the results.

Conduct observations over the course of a calendar year. The observations can be conducted over time (e.g., to conduct observations at 24 locations, one could conduct 2 observations per month). It is also possible to conduct observations at all locations once a year (e.g., all in January), but this may not be realistic due to staffing and time constraints. Regardless of the method chosen, it is important that the observations be conducted in the same manner on an annual basis.

While it is necessary to re-randomize the list of observation locations on an annual basis, you can randomly select those locations from the same list of locations for an extended period of time (i.e., a few years), as traffic volume is not likely to change substantially over a one year period. Tribes/Tribal Organizations should update the traffic volume assessment if they become aware of construction, new roads, added stop lights, or any other changes that would increase/decrease the number of potential observation locations. When the traffic volume assessment is revised, it would then be necessary to re-select observation locations, so newly added locations have an equal probability of being selected.

Please review the accompanying Steps to Follow document which outlines steps to follow prior to and during observational seat belt surveys. Also review the Observational Seat Belt Use Form to record observations.

Note 1: If you would like to evaluate a specific intervention activity (e.g., a media campaign that will take place over a six-month period), you would need to conduct the full set of observations (i.e., in the above example, all 24 locations) prior to and following the intervention. It is not possible to conduct

observations at 12 locations prior to the intervention and at another 12 locations following the intervention, as there will be insufficient numbers to estimate seat belt use.

Note 2: Data collection methods for Child Passenger Safety (CPS) seat use are not included in this protocol for several important reasons. First, without stopping a vehicle, it is difficult to assess the age of a child and to determine if a child is using the proper restraint system. Second, all children under the age of 12 should be in the backseat of a vehicle, where it is difficult to accurately observe lap and/or shoulder belt usage and car seat usage in a moving vehicle. Finally, it is not possible to calculate accurate usage rates for this population because it is difficult to identify the total number of children observed (i.e., the denominator). Because many Tribal communities are trying to collect at least some information about CPS seat use while conducting seat belt use surveys, a "notes" section has been included on the Observational Survey Form, where one can document information about unrestrained children. This information can therefore be used to augment the front seat occupant usage rates one determines following the other components of this protocol. There are standardized guidelines for the conduct of a CPS seat observational survey and protocols to conduct a CPS seat check. We recommend that you consider implementing separate observation periods to document use of and/or correct use of CPS seats.

4. Summarize Annual Seat Belt Use Data

Observational seat belt survey results should be aggregated over the course of one year (i.e., combine data from all of the required locations to present one seat belt use rate for the Tribe/Tribal Organization). It is important not to present or compare individual results (i.e., month to month or round to round) because the sample size is too small to accurately reflect seat belt use for the whole population. The only way to obtain precise estimates is to aggregate all of the results for the year. Once you have two or more years' worth of data, you can compare data from year to year.

To aggregate all of the observational seat belt use data over one year, you will need to enter the raw data (i.e., total number of drivers and passengers observed and restrained) into a spreadsheet. When you have completed all of the observations for the year, you can then determine the seat belt use rate for the Tribe/Tribal Organization. See the sample spreadsheet below.

Observation Location	Timeframe	# of Drivers Belted	# of Drivers Observed	# of Passengers Belted	# of Passengers Observed
James and Ivy Intersection.	Morning	23	65	4	15
Rts 1 & 5	Lunch	75	120	20	60
Rts. 7 &14	Lunch	25	55	6	20
Main and P St.	Lunch	95	200	22	85
Florida and Pacific	Morning	88	250	15	60
Rocky Ridge and Desert Rd.	Afternoon	72	100	18	55
Rts. 7 & 10	Afternoon	45	95	12	40
Iron Rd. and Post Office	Afternoon	33	88	4	15
Total		**456**	**973**	**101**	**350**

In the above example, you can see the total number of drivers belted and observed and the total number of passengers belted and observed. From these numbers you can calculate the annual Tribal driver seat belt use rate (46.9%) by dividing the total number of belted drivers (456) by the total number of observed drivers (973). To calculate the annual Tribal passenger seat belt use rate (28.9%), divide the total number of belted passengers (101) by the total number of observed passengers (350).

Instructions for how to summarize raw seat belt data can be found on the back of the attached Observational Seat Belt Use Form and in the attached document, Calculating Usage Rates.

Observation Location Identification Worksheet A

Instructions:

1. In **the 1st column,** list all possible road/street intersections in your community or communities (selecting only those intersections that meet **all** the criteria in Step One, page one).
2. In **the 3rd column**, identify the number of vehicles you observed at each location for approximately 15 minutes.
3. In the **4th and 5th columns**, identify a start and end time for each traffic volume assessment you conducted for all of the locations you identified in the first column.

Observation Locations	Time Interval	Assessing Traffic Volume			60-minute Traffic Flow *(15 minute traffic volume * 4)*
		(# of vehicles observed in 15 minutes)	*Start Time*	*End Time*	
1.	Morning (7:00 - 9:00 am)				
	Lunch (11:30 am-1:30 pm)				
	Afternoon (4:30 – 6:30 pm)				
2.	Morning (7:00 - 9:00 am)				
	Lunch (11:30 am-1:30 pm)				
	Afternoon (4:30 – 6:30 pm)				
3.	Morning (7:00 - 9:00 am)				
	Lunch (11:30 am-1:30 pm)				
	Afternoon (4:30 – 6:30 pm)				
4.	Morning (7:00 - 9:00 am)				
	Lunch (11:30 am-1:30 pm)				
	Afternoon (4:30 – 6:30 pm)				
5.	Morning (7:00 - 9:00 am)				
	Lunch (11:30 am-1:30 pm)				
	Afternoon (4:30 – 6:30 pm)				
6.	Morning (7:00 - 9:00 am)				
	Lunch (11:30 am-1:30 pm)				
	Afternoon (4:30 – 6:30 pm)				
7.	Morning (7:00 - 9:00 am)				
	Lunch (11:30 am-1:30 pm)				
	Afternoon (4:30 – 6:30 pm)				
8.	Morning (7:00 - 9:00 am)				
	Lunch (11:30 am-1:30 pm)				
	Afternoon (4:30 – 6:30 pm)				
9.	Morning (7:00 - 9:00 am)				
	Lunch (11:30 am-1:30 pm)				
	Afternoon (4:30 – 6:30 pm)				
10.	Morning (7:00 - 9:00 am)				
	Lunch (11:30 am-1:30 pm)				
	Afternoon (4:30 – 6:30 pm)				
11.	Morning (7:00 - 9:00 am)				
	Lunch (11:30 am-1:30 pm)				
	Afternoon (4:30 – 6:30 pm)				
12.	Morning (7:00 - 9:00 am)				
	Lunch (11:30 am-1:30 pm)				
	Afternoon (4:30 – 6:30 pm)				
13.	Morning (7:00 - 9:00 am)				
	Lunch (11:30 am-1:30 pm)				
	Afternoon (4:30 – 6:30 pm)				
14.	Morning (7:00 - 9:00 am)				
	Lunch (11:30 am-1:30 pm)				
	Afternoon (4:30 – 6:30 pm)				

Observation Location Identification Worksheet A

Observation Locations	Time Interval	Assessing Traffic Volume			60-minute Traffic Flow
		(# of vehicles observed in 15 minutes)	*Start Time*	*End Time*	*(15 minute traffic volume * 4)*
15.	Morning (7:00 - 9:00 am)				
	Lunch (11:30 am-1:30 pm)				
	Afternoon (4:30 – 6:30 pm)				
16.	Morning (7:00 - 9:00 am)				
	Lunch (11:30 am-1:30 pm)				
	Afternoon (4:30 – 6:30 pm)				
17.	Morning (7:00 - 9:00 am)				
	Lunch (11:30 am-1:30 pm)				
	Afternoon (4:30 – 6:30 pm)				
18.	Morning (7:00 - 9:00 am)				
	Lunch (11:30 am-1:30 pm)				
	Afternoon (4:30 – 6:30 pm)				
19.	Morning (7:00 - 9:00 am)				
	Lunch (11:30 am-1:30 pm)				
	Afternoon (4:30 – 6:30 pm)				
20.	Morning (7:00 - 9:00 am)				
	Lunch (11:30 am-1:30 pm)				
	Afternoon (4:30 – 6:30 pm)				
21.	Morning (7:00 - 9:00 am)				
	Lunch (11:30 am-1:30 pm)				
	Afternoon (4:30 – 6:30 pm)				
22.	Morning (7:00 - 9:00 am)				
	Lunch (11:30 am-1:30 pm)				
	Afternoon (4:30 – 6:30 pm)				
23.	Morning (7:00 - 9:00 am)				
	Lunch (11:30 am-1:30 pm)				
	Afternoon (4:30 – 6:30 pm)				
24.	Morning (7:00 - 9:00 am)				
	Lunch (11:30 am-1:30 pm)				
	Afternoon (4:30 – 6:30 pm)				
25.	Morning (7:00 - 9:00 am)				
	Lunch (11:30 am-1:30 pm)				
	Afternoon (4:30 – 6:30 pm)				
26.	Morning (7:00 - 9:00 am)				
	Lunch (11:30 am-1:30 pm)				
	Afternoon (4:30 – 6:30 pm)				
27.	Morning (7:00 - 9:00 am)				
	Lunch (11:30 am-1:30 pm)				
	Afternoon (4:30 – 6:30 pm)				
28.	Morning (7:00 - 9:00 am)				
	Lunch (11:30 am-1:30 pm)				
	Afternoon (4:30 – 6:30 pm)				
29.	Morning (7:00 - 9:00 am)				
	Lunch (11:30 am-1:30 pm)				
	Afternoon (4:30 – 6:30 pm)				
30.	Morning (7:00 - 9:00 am)				
	Lunch (11:30 am-1:30 pm)				
	Afternoon (4:30 – 6:30 pm)				

Observation Location Identification Worksheet B

Instructions:

4. In **the 1st column,** list all possible road/street intersections in your community or communities (selecting only those intersections that meet **all** the criteria in Step One, page one).
5. In **the 3rd column**, identify the number of vehicles you observed at each location for approximately 15 minutes.
6. In the **4th and 5th columns**, identify a start and end time for each traffic volume assessment you conducted for all of the locations you identified in the first column.

Observation Locations	Time Interval	Assessing Traffic Volume			60-minute Traffic Flow *(30 minute traffic volume * 2)*
		(# of vehicles observed in 30 minutes)	*Start Time*	*End Time*	
1.	Morning (7:00 - 9:00 am)				
	Lunch (11:30 am-1:30 pm)				
	Afternoon (4:30 – 6:30 pm)				
2.	Morning (7:00 - 9:00 am)				
	Lunch (11:30 am-1:30 pm)				
	Afternoon (4:30 – 6:30 pm)				
3.	Morning (7:00 - 9:00 am)				
	Lunch (11:30 am-1:30 pm)				
	Afternoon (4:30 – 6:30 pm)				
4.	Morning (7:00 - 9:00 am)				
	Lunch (11:30 am-1:30 pm)				
	Afternoon (4:30 – 6:30 pm)				
5.	Morning (7:00 - 9:00 am)				
	Lunch (11:30 am-1:30 pm)				
	Afternoon (4:30 – 6:30 pm)				
6.	Morning (7:00 - 9:00 am)				
	Lunch (11:30 am-1:30 pm)				
	Afternoon (4:30 – 6:30 pm)				
7.	Morning (7:00 - 9:00 am)				
	Lunch (11:30 am-1:30 pm)				
	Afternoon (4:30 – 6:30 pm)				
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	Lunch (11:30 am-1:30 pm)				
	Afternoon (4:30 – 6:30 pm)				
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	Lunch (11:30 am-1:30 pm)				
	Afternoon (4:30 – 6:30 pm)				
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	Lunch (11:30 am-1:30 pm)				
	Afternoon (4:30 – 6:30 pm)				
11.	Morning (7:00 - 9:00 am)				
	Lunch (11:30 am-1:30 pm)				
	Afternoon (4:30 – 6:30 pm)				
12.	Morning (7:00 - 9:00 am)				
	Lunch (11:30 am-1:30 pm)				
	Afternoon (4:30 – 6:30 pm)				
13.	Morning (7:00 - 9:00 am)				
	Lunch (11:30 am-1:30 pm)				
	Afternoon (4:30 – 6:30 pm)				
14.	Morning (7:00 - 9:00 am)				
	Lunch (11:30 am-1:30 pm)				
	Afternoon (4:30 – 6:30 pm)				

Observation Location Identification Worksheet B

Observation Locations	Time Interval	Assessing Traffic Volume			60-minute Traffic Flow
		(# of vehicles observed in 30 minutes)	*Start Time*	*End Time*	*(30 minute traffic volume * 2)*
15.	Morning (7:00 - 9:00 am)				
	Lunch (11:30 am-1:30 pm)				
	Afternoon (4:30 – 6:30 pm)				
16.	Morning (7:00 - 9:00 am)				
	Lunch (11:30 am-1:30 pm)				
	Afternoon (4:30 – 6:30 pm)				
17.	Morning (7:00 - 9:00 am)				
	Lunch (11:30 am-1:30 pm)				
	Afternoon (4:30 – 6:30 pm)				
18.	Morning (7:00 - 9:00 am)				
	Lunch (11:30 am-1:30 pm)				
	Afternoon (4:30 – 6:30 pm)				
19.	Morning (7:00 - 9:00 am)				
	Lunch (11:30 am-1:30 pm)				
	Afternoon (4:30 – 6:30 pm)				
20.	Morning (7:00 - 9:00 am)				
	Lunch (11:30 am-1:30 pm)				
	Afternoon (4:30 – 6:30 pm)				
21.	Morning (7:00 - 9:00 am)				
	Lunch (11:30 am-1:30 pm)				
	Afternoon (4:30 – 6:30 pm)				
22.	Morning (7:00 - 9:00 am)				
	Lunch (11:30 am-1:30 pm)				
	Afternoon (4:30 – 6:30 pm)				
23.	Morning (7:00 - 9:00 am)				
	Lunch (11:30 am-1:30 pm)				
	Afternoon (4:30 – 6:30 pm)				
24.	Morning (7:00 - 9:00 am)				
	Lunch (11:30 am-1:30 pm)				
	Afternoon (4:30 – 6:30 pm)				
25.	Morning (7:00 - 9:00 am)				
	Lunch (11:30 am-1:30 pm)				
	Afternoon (4:30 – 6:30 pm)				
26.	Morning (7:00 - 9:00 am)				
	Lunch (11:30 am-1:30 pm)				
	Afternoon (4:30 – 6:30 pm)				
27.	Morning (7:00 - 9:00 am)				
	Lunch (11:30 am-1:30 pm)				
	Afternoon (4:30 – 6:30 pm)				
28.	Morning (7:00 - 9:00 am)				
	Lunch (11:30 am-1:30 pm)				
	Afternoon (4:30 – 6:30 pm)				
29.	Morning (7:00 - 9:00 am)				
	Lunch (11:30 am-1:30 pm)				
	Afternoon (4:30 – 6:30 pm)				
30.	Morning (7:00 - 9:00 am)				
	Lunch (11:30 am-1:30 pm)				
	Afternoon (4:30 – 6:30 pm)				

I. Determining which Observation Locations to Exclude

Instructions:

1. Once you have completed the observation location identification worksheet, review the last column on that worksheet ("60-minute Traffic Flow").
2. In the **1st column** below, list all of the observation location/time-interval combinations where there were less than 50 observations in the 60-minute period. You may need to add rows in the table below.
3. In **Box A** below, calculate the percent of all observation locations that would be eliminated with the 50 or less observations on the 60-minute period.
4. If the percent is 20% or less, then eliminate those locations from being selected. If the percent is greater than 20%, start these instructions over, but eliminate the observation location/time-interval combinations where there were less than 25 observations in the 60-minute period (use the **2nd column** below).
5. Continue this process until only 20% or less of the observation location/time-interval combinations have been eliminated.

50 or less observations	**25 or less observations**
Location/Time Interval	Location/Time Interval
1.	1.
2.	2.
3.	3.
4.	4.
5.	5.
6.	6.
7.	7.
8.	8.
9.	9.
10.	10.
11.	11.
12.	12.
13.	13.
14.	14.
15.	15.

Box A – Formula to identify % of observation location/time-interval combinations to be excluded.

% of observation location/time-interval combinations to be excluded =	Total # of observation location/time-interval combinations to be excluded = _____ Divided by Total # of observation location/time-interval combinations = _____	Multiply answer by 100 to obtain percentage

Box A - Example

% of observation location/time-interval combinations to be excluded = 41.6%	Total # of observation location/time-interval combinations to be excluded = 5 Divided by Total # of observation location/time-interval combinations = 12	5/12 = .416x100 = 41.6% Multiply answer by 100 to obtain percentage

II. Determining the Required Number of Observation Locations to Survey

Instructions:

a. After you have determined which observation locations/time-interval combinations to eliminate, list all of the remaining locations/time-interval combinations and the 60-minute traffic volume into two columns in a spreadsheet such as Excel [you can also just list it into two columns on a piece of paper, if necessary].

b. Calculate the average number of observations for the list of observation locations.
To do this in Excel, follow these steps:

- In the 60-minute traffic volume column that you created, put your curser in the cell just beneath the last number listed.
- From the menu click "Insert" and then choose "function". From the functions available, select "average" and click "ok".
- Check that the range of cells listed corresponds to all of the cells for which you want the average to be calculated and click "ok". If the range of cells is incorrect, insert your cursor into the text box and change it to reflect which cells you want the function to include.
- The program will then calculate the average number of observations for you.

To do this by hand, follow these steps:

- Add up all of the numbers listed in the column "60-minute traffic volume" (e.g., 35+45+25+65=170).
- Divide that number by the total number of observation location/time-interval combinations (e.g., 170/4=42.5)
- This will give you the average number of observations for all of the observation location/time interval combinations (e.g., around 43).

c. Refer to the table below to determine the number of observation locations required (e.g., 32 observation locations would be required).

Average Number of Observations/Location	# of Observation Locations
20-29	41
30-39	35
40-49	32
50-59	30
60-79	28
80-99	27
100-129	26
130-199	25
200 and over	24

Steps to Follow While Conducting Observations

1. **60-minute Rule:**
   You will base your observational period on time; not the number of vehicles that you observe. Due to the remoteness of some of the observation locations, it may not be possible to observe a large number of vehicles. Even if you only observe a small number of vehicles at one location, you should observe the location for 60 minutes.

2. **Single Direction Observation:**
   This protocol requires that you only observe vehicles traveling in one direction at the observation location. This is true even if you are observing at a "low volume" location. This will help you to minimize counting the same vehicles twice during the observation period. It will also make it easier for you to reliably collect/document the data at a location with high-traffic volume.

3. **Observe shoulder-strap seat belt users only:**
   When conducting observations, count only **front seat drivers/passengers who are properly wearing shoulder straps** as 'wearing a seat belt.' Therefore, if you observe that the driver/passenger is wearing the shoulder strap behind his/her back (an improper use of the seat belt), count it as 'not wearing seat belt'. If you have any difficulty or doubts about whether the driver/passenger is wearing a shoulder strap (e.g., you could not see because of tinted windows or because of the vehicle speed), mark a circle in the appropriate space on the observation form.

   Remember, this survey is not designed to observe child safety seat usage. However, keep the following in mind:
   - Children riding in the front outboard passenger seat of a vehicle who are not in a child safety seat should be observed and counted as any other front seat passenger (i.e., 'not wearing a seat belt').
   - If there is a child riding in the middle space of the front seat, do not count this as an observation, as it is not possible to identify if the child is restrained (i.e., no shoulder-strap).
   - This survey does not ask you to document if you observe children/passengers riding in the back of pick-up trucks. However, feel free to make a side note to this affect on the data collection form if you need/want this information.
   - If you observe a child riding in a car seat in the front outboard passenger seat, place a circle in the appropriate place on the observation form.

4. **Observe only passenger vehicles**
   When conducting observations, observe passenger vehicles only. Do not count "service vehicles" or large commercial vehicles (e.g., Coca Cola truck). If you want to document whether a passenger vehicle is a Tribal employee vehicle, you may do so by putting a separate notation on the form.

Steps to Follow When Completing the Observational Survey Form

1. **Indicate your name, and date, time, location, and direction of travel of the observation location:**
   Record the basic information about your observation period on the data collection form including: your name, the date, your location, the direction of travel, and the exact start and end times for your observation period. Remember, observations are to be conducted in the direction of travel that is indicated for that location (only one direction). Following this protocol, observations should also be conducted for 60 minutes at each location. Record your exact start and end time.

2. **Record Results:**
   Use the attached Seat Belt Use Observation Form to record seat belt use among drivers and front seat passengers sitting next to the window (i.e., outboard passengers).
   - Mark a **"Y"** (for Yes) or an **"N"** (for No) for both drivers and outboard passengers observed for each vehicle that passes in the direction you are observing.
   - If no passenger was present in the vehicle observed, draw a **line** (—) across the Y/N Passenger Cells for that vehicle observed.
   - If you are not able to determine if the driver and/or passenger is wearing a seat belt, place a **circle** in the appropriate cell where you could not determine usage.

   Note: Placing a line or a circle in these locations, when appropriate, ensures that you are documenting something for each vehicle and driver/passenger that passes in the direction you are observing. This prevents an assumption that 'blank spots' on the form means that there was not a passenger in the vehicle.

Things to Keep in Mind

1. **Be Inconspicuous:**
   To obtain a valid, unbiased observation of seat belt use in your community, you do not want your presence to cause drivers to buckle-up. Observers should strive to remain inconspicuous (i.e., not easily seen or noticed) to not bias (alter) survey results. For example, if drivers/passengers see in the distance that an observer is checking for seat belt use, they might put on their seat belt prior to the observation and the survey results may therefore report 'inflated' usage rate(s). If you are conducting an observation from within a parked vehicle, the best type of vehicle is an unmarked passenger vehicle (e.g., not a government vehicle). If an observer conducts a survey in a police vehicle, drivers/passengers are likely to buckle up in advance if a primary seat belt law applies and is enforced. This situation may also result in 'inflated' usage rates. We also recommend that observers conduct periodic observational surveys out of uniform, if applicable.

   If you have concerns that your presence on a street corner/intersection may cause alarm for any community members, consider contacting the local police department ahead of time to provide them details about the dates and locations you will be conducting observations.

2. **Safety:** Your safety should be your first priority while conducting observational surveys. Do nothing that may put you in any kind of danger, such as getting out of the vehicle, standing near the road, or parking your vehicle too close to the road. Consider informing your local police department of the times and locations of observation locations and times so that officers are aware of what you are doing.

3. **Observation Variations:**
   The Observational Survey Form used for this project does not collect information about the type of vehicle or gender of drivers/passengers. While this information may be added at a later stage, you do not need to document it for this project.

Observational Seat Belt Use Form

Survey Date: _____ **Start/End Time:** _____ **Direction of Travel:** _____

Name of Observer: _____ **Location of Observation:** _____

Instructions:

Mark a **"Y"** (for Yes) or an **"N"** (for No) for both drivers and outboard passengers observed for each vehicle that passes in the direction you are observing *(See Example 1 to the right).*

If no passenger was present in the vehicle observed, draw a **line** (—) across the Y/N Passenger Cells for that vehicle observed *(See Example 2 to the right).*

If you are not able to determine if the driver and/or passenger is wearing a seat belt, place a **circle** in the appropriate cell for which you could not determine usage *(See example 3 to the right).*

Examples:

	Driver		Pssngr	
	Y	**N**	**Y**	**N**
1.	Y			N
2.	Y		—	—
3.	(Y)	(N)	Y	

Note: If more than 100 vehicles pass by during your 60-minute observation for this date/time/location, use a second observation form.

	Driver		Pssngr			Driver		Pssngr			Driver		Pssngr			Driver		Pssngr	
	Y	**N**	**Y**	**N**		**Y**	**N**	**Y**	**N**		**Y**	**N**	**Y**	**N**		**Y**	**N**	**Y**	**N**
1.					**26.**					**51.**					**76.**				
2.					**27.**					**52.**					**77.**				
3.					**28.**					**53.**					**78.**				
4.					**29.**					**54.**					**79.**				
5.					**30.**					**55.**					**80.**				
6.					**31.**					**56.**					**81.**				
7.					**32.**					**57.**					**82.**				
8.					**33.**					**58.**					**83.**				
9.					**34.**					**59.**					**84.**				
10.					**35.**					**60.**					**85.**				
11.					**36.**					**61.**					**86.**				
12.					**37.**					**62.**					**87.**				
13.					**38.**					**63.**					**88.**				
14.					**39.**					**64.**					**89.**				
15.					**40.**					**65.**					**90.**				
16.					**41.**					**66.**					**91.**				
17.					**42.**					**67.**					**92.**				
18.					**43.**					**68.**					**93.**				
19.					**44.**					**69.**					**94.**				
20.					**45.**					**70.**					**95.**				
21.					**46.**					**71.**					**96.**				
22.					**47.**					**72.**					**97.**				
23.					**48.**					**73.**					**98.**				
24.					**49.**					**74.**					**99.**				
25.					**50.**					**75.**					**100.**				
T					**T**					**T**					**T**				
	D1	**D2**	**P1**	**P2**		**D3**	**D4**	**P3**	**P4**		**D5**	**D6**	**P5**	**P6**		**D7**	**D8**	**P7**	**P8**

If you desire to collect additional information about the cars you observe (e.g., use of car seats, whether you observed tribal employee vehicles, passengers in back of pick-up trucks) use this blank space below.

Box A: Formula to identify raw data to enter into spreadsheet:

Drivers	Passengers
Total # of Drivers Wearing a Seat Belt = _____ (D1+D3+D5+D7) Total # of Drivers Observed = _____ (D1+D3+D5+D7) + (D2+D4+D6+D8)	Total # of Passengers Wearing a Seat Belt = _____ (P1+P3+P5+P7) Total # of Passengers Observed = _____ (P1+P3+P5+P7) + (P2+P4+P6+P8)

Calculating Usage Rates

To calculate annual Tribal/Tribal Organization seat belt use rates, follow the instructions located below.

Remember, when you calculate percentage use for drivers and passengers, the denominator you use for your calculations will probably be different because some vehicles will not have passengers. The formulas provided take this difference into account.

Instructions:

a. In the Total row (shaded) at the bottom of the Seat Belt Use Observation Form, add up the number of 'yes' and 'no' responses for both drivers and passengers. Note: Only count 'yes' and 'no' markings and do not count spaces that have a line or a circle in them.

b. In Box A on the second page of the survey, add up the total number of drivers wearing a seat belt (i.e., columns D1+D3+D5+D7).

c. Also in Box A, add up the total number of drivers observed. Example: (D1+D3+D5+D7) + (D2+D4+D6+D8)

d. In Box A, add up the total number of passengers wearing a seat belt. (i.e., P1+P3+P5+P7).

e. In Box A, add up the total number of passengers observed (it will likely be less than the total number of vehicles). Example: (P1+P3+P5+P7) + (P2+P4+P6+P8).

f. For each observation location, enter the numbers identified for steps b-e in the spreadsheet.

Drivers

g. To determine the total number of drivers wearing a seat belt for the year, add up all the numbers of belted drivers at each observation location.

h. To determine the total number of drivers observed for the year, add up all the numbers of drivers observed at each observation location.

i. To determine the percentage of drivers wearing their seat belt, divide the total number of drivers wearing a seat belt by the total number of drivers observed. Multiply the response by 100.

Passengers

j. To determine the total number of passengers wearing a seat belt for the year, add up all the numbers of belted passengers at each observation location.

k. To determine the total number of passengers observed for the year, add up all the numbers of passengers observed at each observation location.

l. To determine the percentage of passengers wearing their seat belt, divide the total number of drivers wearing a seat belt by the total number of passengers observed. Multiply the response by 100.