# COLORADO DEPARTMENT OF TRANSPORTATION

# DIVISION OF TRANSPORTATION SAFETY

# SEAT BELT USAGE SURVEY - 1993

# FINAL REPORT

Prepared for the U.S. Department of Transportation and the State of Colorado under Contract No. 93-91. This document is disseminated under the sponsorship of the Department of Transportation in the interest of information exchange. The United States Government and the State of Colorado assume no liablilty for the content or use thereof.

PREFACE -

The purpose of this project was to conduct an observational field study of the usage of Seat belts in the passenger vehicle population in the State of Colorado for the year 1993. The basis for the project was the continuing need to conduct these comprehensive and statistically projectable surveys. These studies, conducted by the Institute of Transportation Management through Colorado State, are sponsored by the Office of Transportation Safety, Colorado Department of Transportation. As in previous studies Washington Consulting Group was used for data analysis, and survey design and methodology was employed as originally conceived by them with minor modifications.

Accurate measurement and analysis of proper seat belt usage by observational study remains a necessary tool in the evaluation of the use patterns and compliance with Colorado's mandatory belt law by Colorado passenger vehicle, non-commercial light truck and RV operators. Completion of this survey provides CDOT with data which determines current usage estimates and allows for comparisons with previous years surveys. This information can be used to help target education and enforcement efforts throughout the state by DHS.

EXECUTIVE SUMMARY -

1993 marks the third year that a comprehensive seat belt usage study has been done by ITM/Colorado State for CDOT and the Office of Transportation Safety. It is important to note that several changes were introduced to this years study in an effort to maximize the value of information collected, and to leverage the time of the field staff while at observation sites. The key changes are listed below including:

* Added 100 plus sites per week to the observation schedule
* Hired extra observers, backups and supervisors to accommodate increased sites
* Developed and tested a new field observation form and protocol for manual recording procedures to include demographics of age, and a separate measurement for passenger cars and trucks. * established baseline data for 75 new sites while maintaining original site data to provide a continuity of comparable data with previous years for analysis.

There are several key aspects of this type of survey that are important for the reader to note. As in past surveys multiple roadside observations were taken using mechanical hand counters and a new recording form developed for low speed sites. Observers with the exception of three new personnel were veterans of previous surveys, and made up primarily of retired CHSP officers. Training was given to all observers on the day prior to beginning the surveys, and was reinforced with visits to all new observers in the first two days of the survey to insure continuing high levels of procedural compliance. Eligible vehicles include passenger/personal vehicles including cars, light trucks and recreational vehicles. The driver of the vehicle and the front outboard passenger are the only vehicle occupants that are observed and counted. Children in child restraint seats are excluded as are any center board and backseat passengers. Only clearly observable drivers and front outboard passengers are counted, which excludes occupants in vehicles with heavily tinted windows, or in oversize RV's that cant be seen from ground level. All vehicles used in commercial, governmental, or emergency activities are excluded.

Supervisors monitored 137 sites in the two weeks of surveys which included 748 sites. This is approximately 18.3% of the sites involved. Supervisors reported excellent observer accuracy with most observer/supervisor accuracy checks falling within a 3% range. Some problems were encountered with the use of the new forms in that some sites were too busy to accurately count. The protocol was adjusted to make sure that the forms were used only at extremely slow sites. Site selection and sample size were taken from guidelines developed in response to NHTSA recommendations and provided stratified, randomly selected sites at a mixture of roadway types.

All original data sheets were reality checked by project coordinators and ITM staff upon receipt from the field at the end of each weeks observations. These sheets were then forwarded to the data analysis contractor, the Washington Consulting Group who also performed a quality audit prior to processing.

Significant findings from this survey include:

An increase in seat belt compliance to 52% statewide. This signifies thousands of new drivers and passengers wearing belts.

County by county analysis for the first time which will help target education and enforcement efforts.

Expanded analysis adding Larimer, Garfield, Lincoln, Mesa,and Pueblo counties to the study for the first time.

A significant increase in high speed (5%), rush hour and local road compliance ( 6% ). Also a notable increase in the Eastern Region (4%). Decreases in usage are either very small, or have few observations which makes them less than significant for analysis.

ADMINISTRATIVE EVALUATION -

Objective Compliance:

The original objectives of the study were met by ITM with the exception that one site was omitted in error from a map and was not included in the study. 374 sites were surveyed over two designated weeks in September. These were roadside observational studies and were conducted according to NHTSA, WCG, and ITM developed guidelines. This is the same survey design as the last two studies with small adjustments to some sites to account for changes in roadside conditions, ie construction etc. The surveys were conducted in the three designated regions and were conducted in 24 counties. Where possible, new manual forms were used which allowed the observers to observe vehicle type, and age at low speed, low volume road sites. 18 observers were hired and trained along with 3 supervisors ( plus Coordinator ). Each was trained at a session prior to beginning observations. All dates and times were accurately met as was the random selection of time of day and day of the week for observations.

Assessment of Objective Accomplishments:

All major objectives of this roadside survey appear to have been met. NHTSA design objectives were also met which allows the survey to be an effective tool for monitoring compliance with seat belt law, and targeting educational efforts.

Qualitative objectives were met as well with this survey, including an extremely high level of agreement between observers and supervisors on test counts. This can be attributed to the high retention rate of personnel over the three years of the survey, and the recently completed motorcycle helmet study which leveraged these procedures and provided some near term practice. This field staff has a high % of retired CHSP officers who have excellent familiarity with roads and vehicle monitoring which has always lead to a accurate results when combined with solid field research methodology.

A major contribution to this successful study was the professionalism and cooperation of the staff at the Office of Transportation Safety. Strong guidance and direction were particularly helpful from Stephanie Olsen. A key element to the success of the study was the extraordinary effort by Tim Baker to activate the study and provide unwavering support and cooperation for the project. His personal visitation of several sites contributed to an even greater understanding between OTS and ITM on these types of studies.

A training manual and roster of observers and supervisors is

attached to this report at the end which provides further information about methodology and procedure for general information.

ITM is confident that the information and analysis provided is accurate in terms of current knowledge. The project coordinator is available to discuss the survey with OTS personnel at any time.

As in previous years all financial constraints of the project were met without modification and a surplus of funds existed in all accounts. However is noted that weather has been virtually perfect, and other all aspects of the survey and personnel were without incident. These contributes to a very efficient study, but it is recommended that these safety margins remain in budgeting in the event of future problems.

WCG was again used for the data analysis and proved to be a reliable and efficient contractor.

**Problems and Issues:**

The primary problems in the study came from a late decision to proceed with the study and the use of the new forms for manually recording the demographic data. If a 1994 study is authorized it is recommended that an early commitment is made which will allow the ITM field staff to adjust their schedules accordingly.

The problems encountered with the new forms included some confusion by the field staff on how to use the form, and the use of the form at locations where the traffic was low speed but high volume. Also there were some data transferral problems which were identified and corrected in the after survey audit by WCG.

**Conclusions:**

Once again ITM/Colorado State appreciates the opportunity to participate in the Seat Belt Usage survey for 1993. I feel that to the best of my knowledge , the survey is accurate, complete and was submitted to WCG for analysis in compliance with project guidelines.

I sincerely appreciate the opportunity to work with OTS on this project and want to thank Nancy Graham , Dottie Fucetola and Bill Nelson of the ITM group for their fantastic support and help in completing this project.

K. Jeffry Boulter
Project Coordinator
Institute of Transportation Management

OLORADO DEPARTMENT OF HIGHWAYS
ION OF HIGHWAY SAFETY
CONTRACT EVALUATION DATA

| Project # | HSP# | Task # |
|---|---|---|
| 93-31 | 93-06 | 61-06 |

| Task Activity # | EVALUATION DESCRIPTION | Type of Evaluation | Report Timeframe |
|---|---|---|---|
| 31.06.1 | 18 observers were hired at a rate of $10.00 per hour. | Coordinator | Final |
| 31.06.2 | 3 Supervisors were hired along with the Project Coordinator to serve as a back-up. Supervisors were paid $15.00 per hr. | Coordinator | Final |
| 31.06.3 | New metal counters and old were combined to provide 50 sets for use by observers and supervisors | Coordinator | Final |
| 31.06.4 | All supervisors and 14 observers were trained at a session on Sunday September 5th. Other 4 observers were trained by Video tape and personal visit by the Supervisors. | Coordinator | Final |
| 31.06.5 | First set of Surveys was conducted and Complete by September 12. All but 1 observer complete by September 11.(374) | Coordinator | Final |
| 31.06.6 | Original recording sheets were completed and sent to WCG on the 13th as specified and copies were sent to OTS | Coordinator | Final |
| 1.06.7 | Second Set of Surveys (374) were conducted and complete by September 21,1993 | Coordinator | Final |
| 1.06.8 | Completed original recording sheets were sent to WCG on September 23,1993 and copies were sent to OTS. | Coordinator | Final |
| 1.06.9 | A complete report was provided on November 13,1993 with all required documentation | Coordinator | Final |

Washington Consulting Group

MEMORANDUM

TO: Jeff Boulter

FROM: Jean Schuller/Josefina Lago, WCG

DATE: September 30,1993

SUBJECT: Results for the September 1993 Safety Belt Usage Survey in Colorado (Wave 4)

This memorandum summarizes the results of the 1993 Colorado Safety Belt Usage Survey and compares these results to the previous survey waves.

The 1993 survey was conducted at 374 sites in 24 counties. These sites consisted of the original 300 sites sampled for the original survey conducted in 1990 and the additional 74 sites which were added per request of the Colorado Department of Transportation. The original 300 sites were analyzed separately to calculate the weighted overall estimate and by subdomain. All the 374 sites were analyzed together to calculate the unweighted county and overall estimates.

1. Analysis of Original 300 Sites for Wave 4

As shown in Table 1, the weighted estimate of overall belt usage for Colorado in September 1993 is 52 percent. This estimate may vary 2.2 percent due to sampling variability since not all roads in the State were observed. Thus, a 95 percent confidence interval of the overall estimated usage rate is from 48 to 56 percent.

Although the survey was designed to satisfy the precision requirements for the overall State estimate and regional estimates, the total sample is large enough to allow estimates by subgroups, such as type of road, traveling speed, and weather conditions. These estimates, standard errors, and 95 percent confidence intervals are also presented in Table 1. Any point within a 95 percent confidence interval is considered a statistically valid estimate of the usage rate; hence overlapping confidence intervals indicate that although the observed estimates suggest an increase or decrease in the usage rate, the observed rate change cannot be declared statistically significant. As shown in Table 1, the usage rate in the Eastern region is lower than the other two regions, although the difference cannot be declared statistically significant because the 95 percent confidence intervals overlap. The difference between the Western region and Frontal region, however, is statistically significant since the 95 percent confidence intervals do not overlap. The differences in the usage rates associated with low and medium speed and high speed are also statistically significant. The remaining subgroups differences appear to be due to sampling variability and are not statistically significant at the 95 percent confidence level.

2. Comparison of the Third (1992) and Fourth (1993) Surveys for the Original 300 Sites

Table 2 compares the usage rates obtained from the 1992 and 1993 surveys. It appears that the usage rate increased in the 11 month period between the two surveys, overall as well as for most subgroup estimates. Overall, the 2 percent increase is not statistically significant since the confidence intervals overlap by several percentage points. All of the observed differences for the subgroup estimates may be attributed to sampling variability since the 95 percent confidence intervals overlap.

3. Trends in Safety Belt Usage for the Original 300 Sites

Figures 1 to 7 show the trend in belt usage from the first survey in 1990 to the fourth survey in 1993. In general, these graphs only show minor fluctuations in an upward trend, but the changes are not large enough to be considered statistically significant. Figure 1 shows the overall usage rates from 1990 to 1993. The 95 percent confidence interval for Wave 4 is displayed as well. Any estimate not contained within this band can be considered statistically different from the Wave 4 estimate, and thus a significant change over time.

4. Unweighted Estimates of Safety Belt Usage by County and Overall for the 374 Sites

As shown in Table 3, the overall unweighted estimate of safety belt use for the 374 sites is 53.4 percent, slightly higher than the weighted estimate. Table 3 also contains the county unweighted estimates and the number of observations per county. The unweighted estimates were based on raw counts of belted and unbelted front seat occupants.

Table 1. Weighted Estimates of Safety Belt Usage for Colorado State by region, weather condition, time, day of the week, speed and road class (September 1993)

| | Number of observations | Estimate (%) | C.V. (%) | Standard Error (%) | 95 percent confidence limits | |
|---|---|---|---|---|---|---|
| | | | | | Lower Limit | Upper Limit |
| Total[1] | 658 | 52 | 4.2 | 2.2 | 48 | 56 |
| Region | | | | | | |
| Front Region | 391 | 55 | 6.2 | 3.4 | 49 | 62 |
| Eastern region | 130 | 40 | 19.0 | 7.6 | 25 | 55 |
| Western region | 137 | 44 | 3.8 | 1.7 | 41 | 48 |
| Weather | | | | | | |
| Clear | 628 | 51 | 3.6 | 1.8 | 48 | 55 |
| Other* | 30 | 60 | 15.6 | 9.4 | 42 | 79 |
| Time | | | | | | |
| Non-rush | 504 | 51 | 3.2 | 1.6 | 48 | 54 |
| Rush | 154 | 57 | 8.3 | 4.7 | 47 | 66 |
| Day of the Week | | | | | | |
| Weekday | 634 | 52 | 4.3 | 2.3 | 48 | 57 |
| Weekend* | 24 | 44 | 8.8 | 3.9 | 37 | 52 |
| Speed | | | | | | |
| 0-30 mph | 300 | 47 | 3.8 | 1.8 | 44 | 51 |
| 31-50 mph | 194 | 51 | 6.5 | 3.3 | 45 | 58 |
| 50+ mph | 164 | 68 | 5.4 | 3.6 | 61 | 75 |
| Road Class | | | | | | |
| Major roads | 386 | 55 | 2.8 | 1.5 | 52 | 58 |
| Local roads | 272 | 51 | 6.4 | 3.2 | 44 | 57 |

* Based on a very small number of observations.

[1] Original 300 sites.

Table 2. Comparison of 1992 and 1993 safety belt usage for Colorado State, by region, weather condition, time, day of the week, speed and road class

| | October 1992 Survey | | | September 1993 Survey | | | 1992-93 Change (%) |
|---|---|---|---|---|---|---|---|
| | Estimate (%) | 95 percent confidence limits | | Estimate (%) | 95 percent confidence limits | | |
| | | Lower Limit | Upper Limit | | Lower Limit | Upper Limit | |
| Total[2] | 50 | 47 | 52 | 52 | 48 | 56 | 2 |
| Region | | | | | | | |
| Front Region | 53 | 51 | 54 | 55 | 49 | 62 | 2 |
| Eastern region | 36 | 18 | 54 | 40 | 25 | 55 | 4 |
| Western region | 47 | 44 | 49 | 44 | 41 | 48 | -3 |
| Weather | | | | | | | |
| Clear | 49 | 47 | 51 | 51 | 48 | 55 | 2 |
| Other* | 60 | 48 | 73 | 60 | 42 | 79 | 0 |
| Time | | | | | | | |
| Non-rush | 49 | 46 | 52 | 51 | 48 | 54 | 2 |
| Rush | 51 | 48 | 55 | 57 | 47 | 66 | 6 |
| Day of the Week | | | | | | | |
| Weekday | 49 | 47 | 52 | 52 | 48 | 57 | 3 |
| Weekend* | 54 | 43 | 64 | 44 | 37 | 52 | -10 |
| Speed | | | | | | | |
| 20 mph | 44 | 40 | 47 | 47 | 44 | 51 | 3 |
| 40 mph | 53 | 47 | 59 | 51 | 45 | 58 | -2 |
| 60 mph | 63 | 59 | 67 | 68 | 61 | 75 | 5 |
| Road Class | | | | | | | |
| Major roads | 56 | 53 | 59 | 55 | 52 | 58 | -1 |
| Local roads | 45 | 41 | 49 | 51 | 44 | 57 | 6 |

* Based on a very small number of observations.

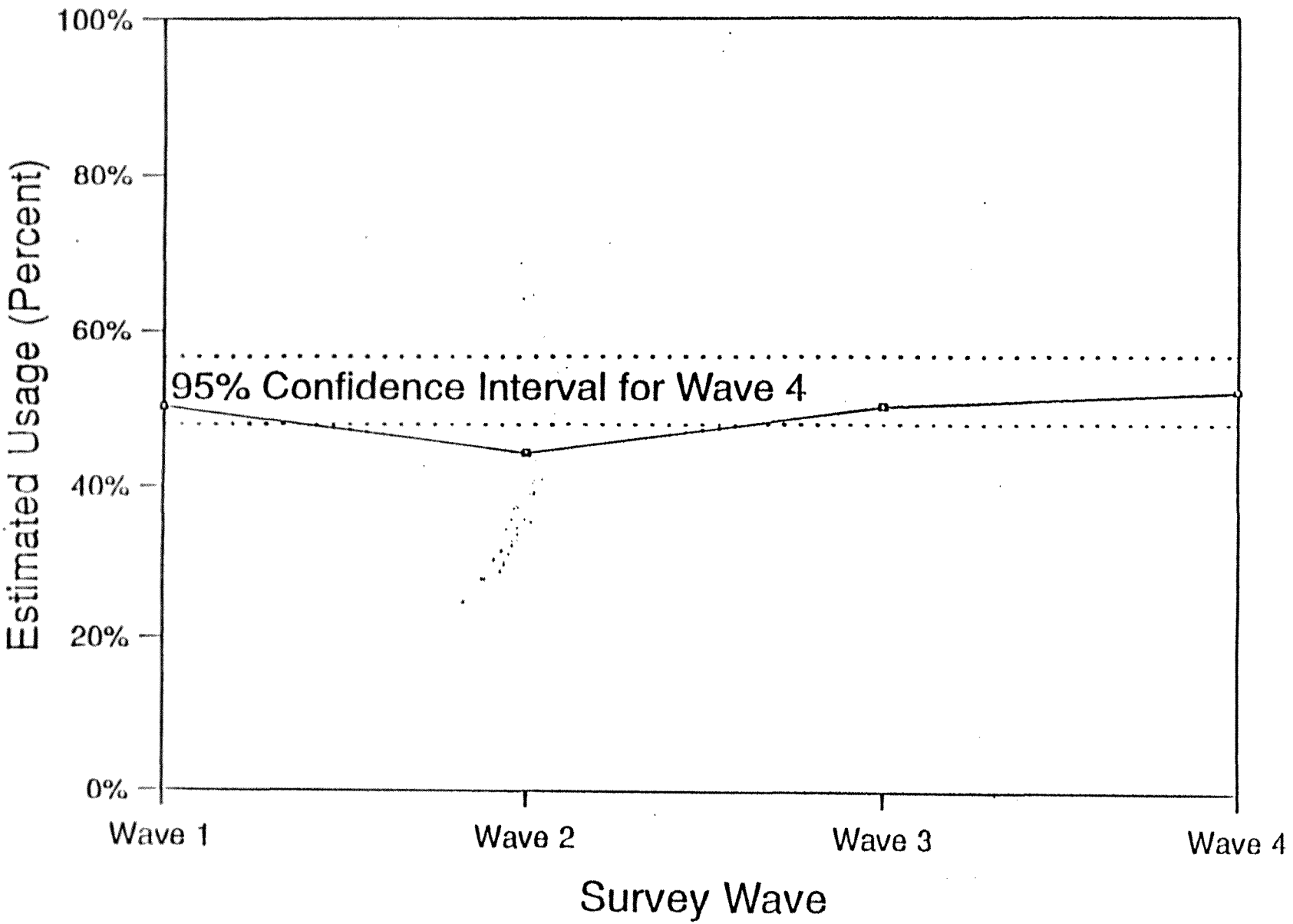
[2] Original 300 sites

Table 3. Unweighted estimates of safety belt usage, by county and overall (September 1993).**

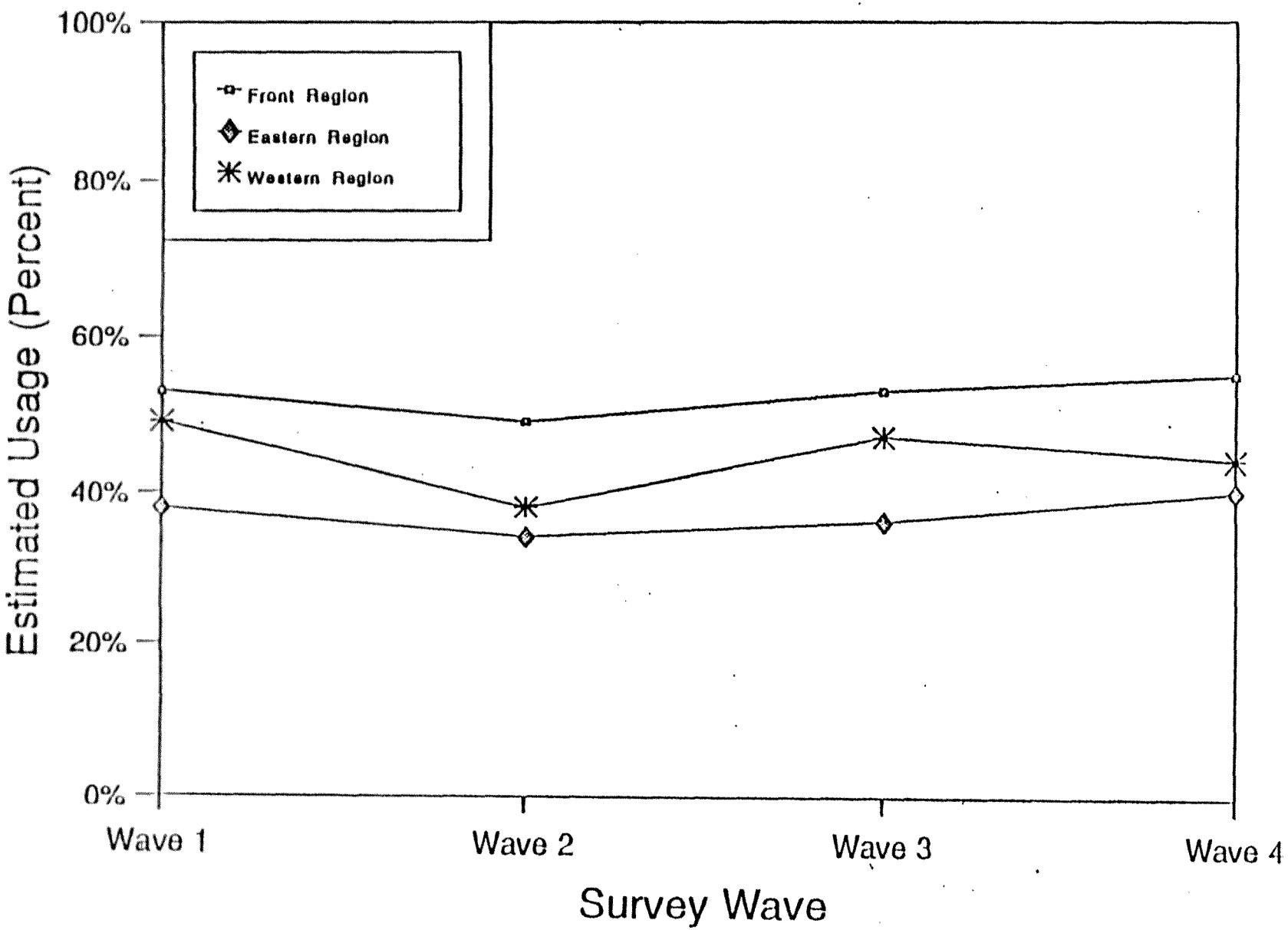
| County | Number of Observations | Estimate (%) |
|---|---|---|
| Adams (001) | 48 | 45.9 |
| Arapahoe (005)* | 44 | 59.3 |
| Boulder (013) | 47 | 56.5 |
| Clear Creek (019)* | 12 | 66.8 |
| Denver (031) | 73 | 56.0 |
| Douglas (035) | 35 | 68.5 |
| Eagle (037) | 24 | 59.1 |
| El Paso (041) | 66 | 63.7 |
| Garfield (045)* | 12 | 59.6 |
| Gunnison (051) | 21 | 38.7 |
| Huerfano (055) | 30 | 49.6 |
| Jefferson (059) | 68 | 75.1 |
| Kiowa (061) | 30 | 47.7 |
| Larimer (069)* | 32 | 57.6 |
| Lincoln (073)* | 12 | 59.9 |
| Logan (075) | 40 | 32.3 |
| Mesa (077)* | 20 | 55.7 |
| Montezuma (083) | 24 | 36.0 |
| Pueblo (101)* | 23 | 44.7 |
| Routt (107) | 22 | 46.7 |
| San Miguel (113) | 22 | 46.2 |
| Sedgwick (115) | 30 | 47.4 |
| Summit (117) | 24 | 58.3 |
| Weld (123) | 54 | 50.2 |
| Overall | 813 | 53.4 |

* These counties were not selected in the original probability sample.
** Unweighted estimates based on raw counts of belted and unbelted front seat occupants.

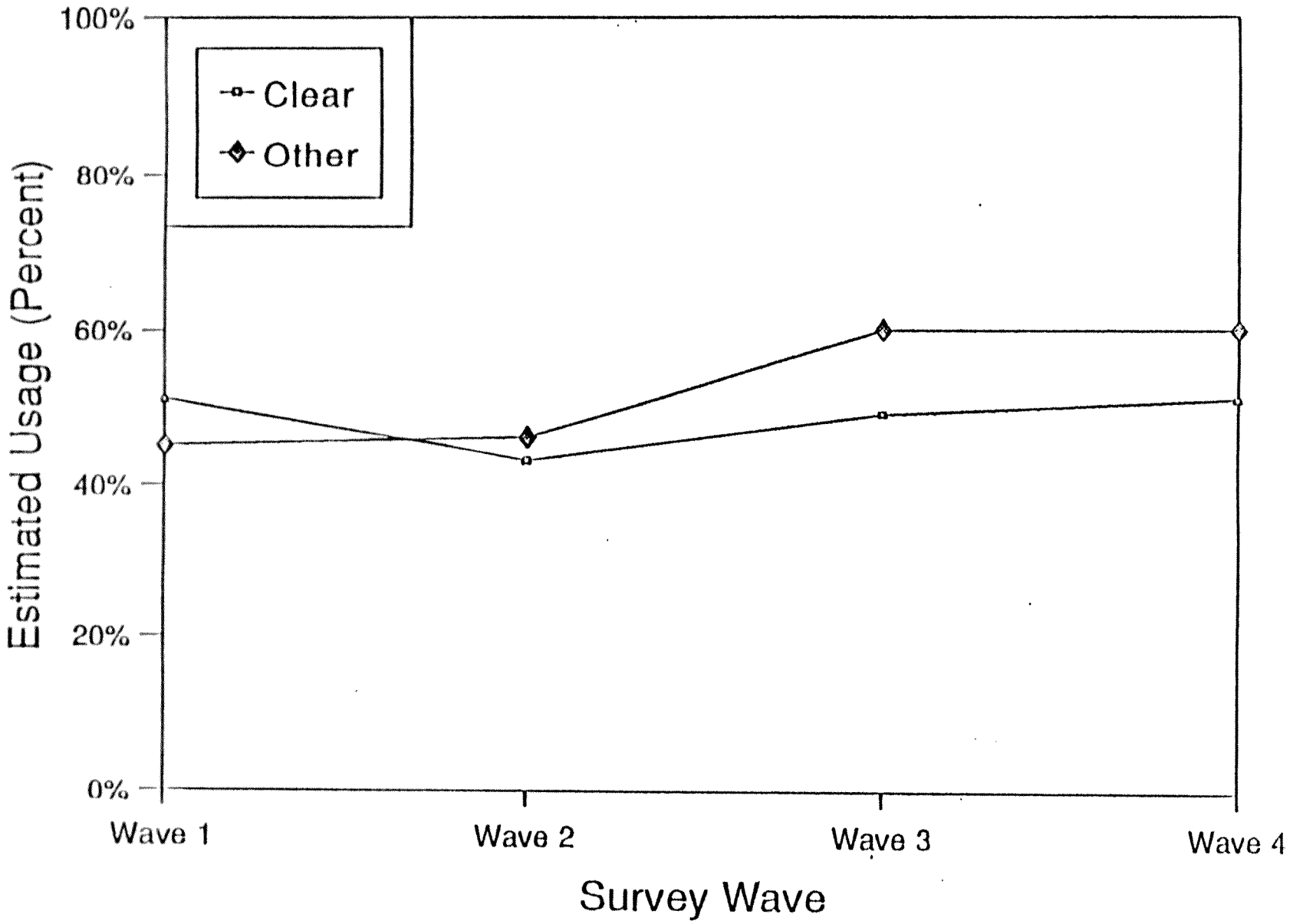
# Figure 1: Overall Trends in Usage Rates



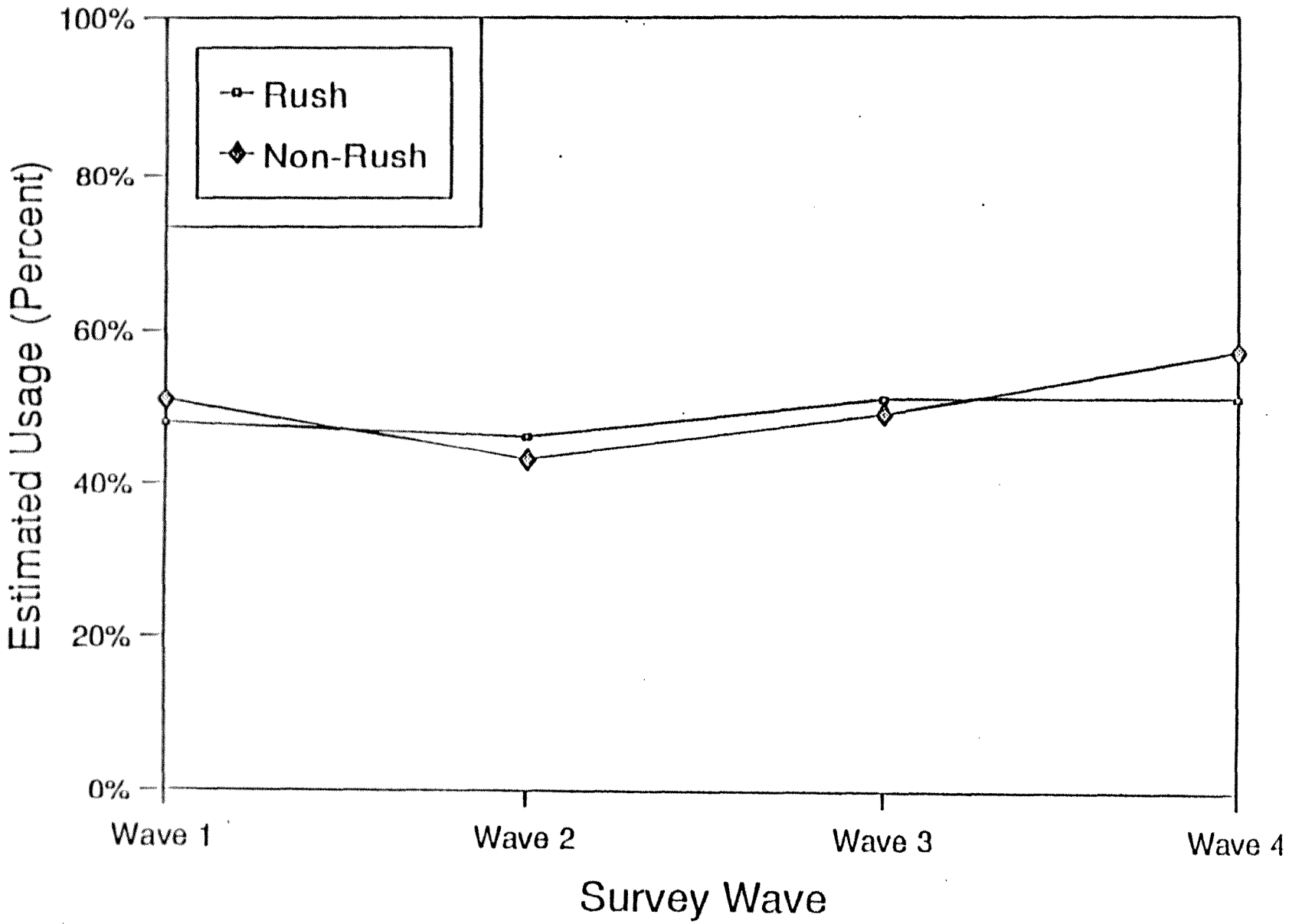
# Figure 2: Trends in Usage Rates by Region



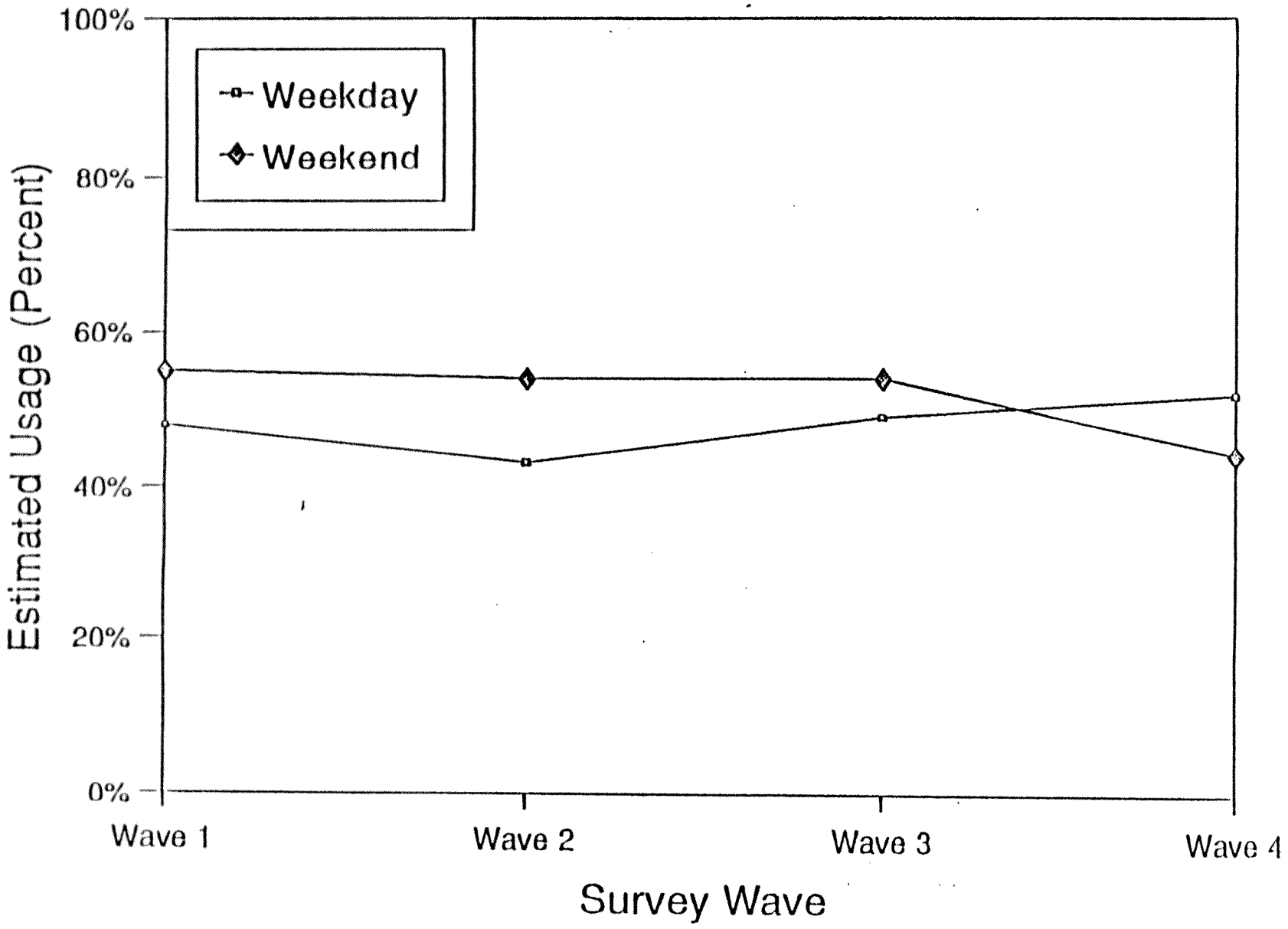
# Figure 3: Trends in Usage Rates by Weather



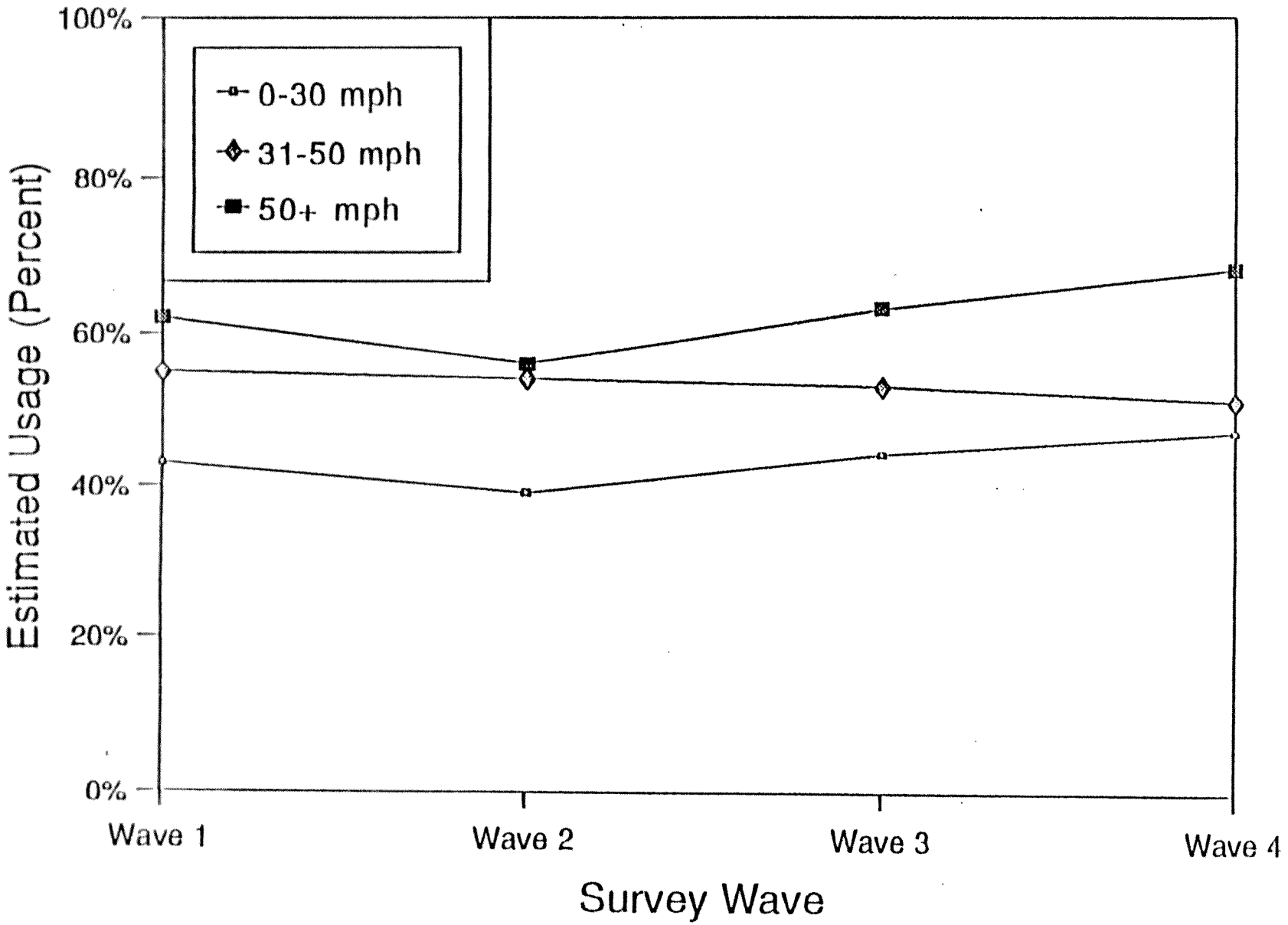
# Figure 4: Trends in Usage Rates by Time of Day



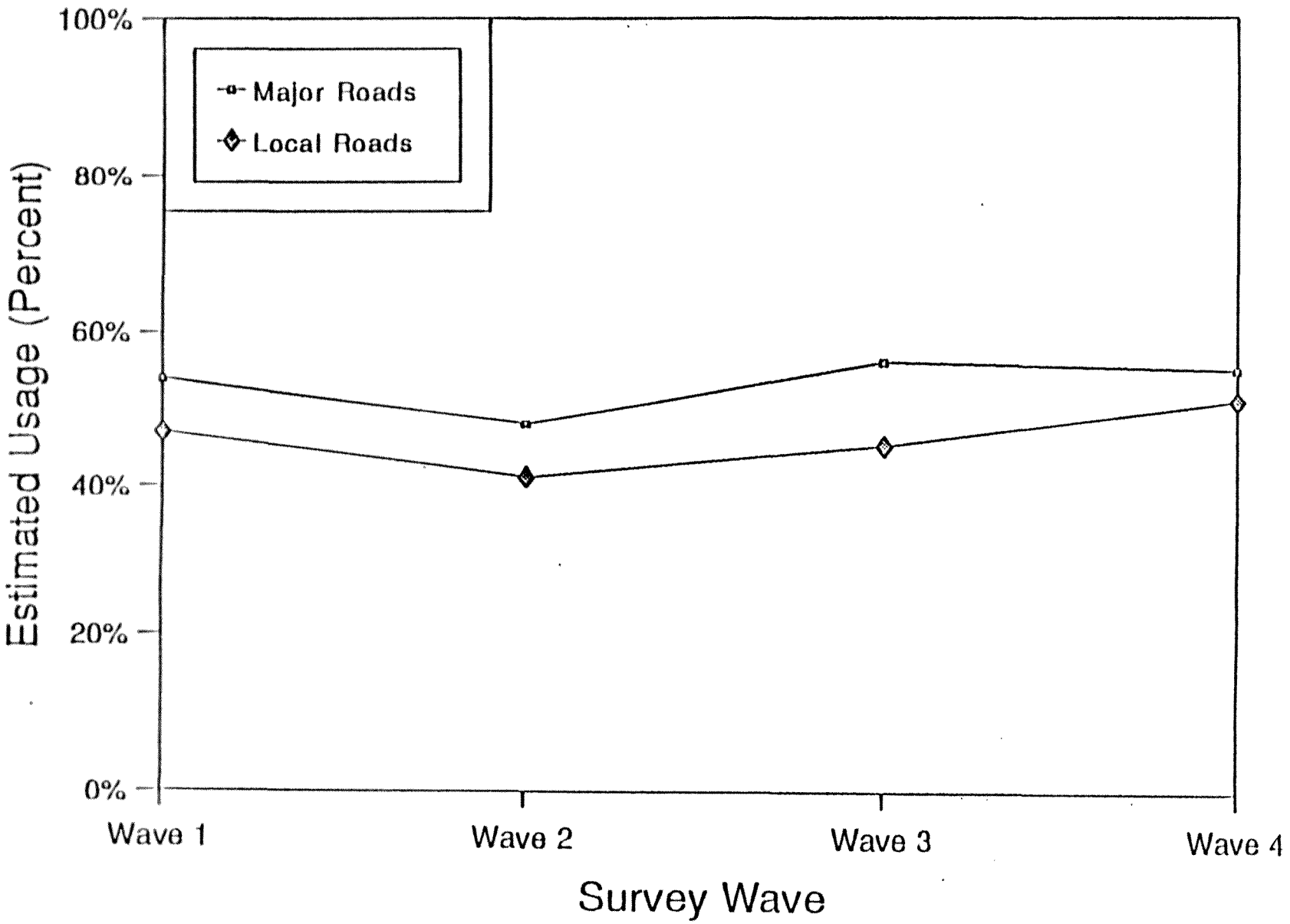
# Figure 5: Trends in Usage Rates by Day of Week



# Figure 6: Trends in Usage Rates by Vehicle Speed



# Figure 7: Trends in Usage Rates by Road Class



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303 422-4503

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SUPERVISOR
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520-52-4959
303 686-9136

Note:
Shiflet will supervise in Boulder and Weld County during week 1. He will observe in Larimer County week 1.
Peterson will observe in Larimer County week 2.
Penner will supervise week 1 only.
Shiflet will supervise full time in week 2.
Nelson will supervise full time both week 1 and week 2.

WCG
WASHINGTON CONSULTING GROUP

# COLORADO SAFETY BELT SURVEY

## Observer's Manual

Prepared by:

Washington Consulting Group
11 Dupont Circle, Suite 900
Washington, D.C. 20036-1271

July 1990

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TABLE OF CONTENTS

# I. INTRODUCTION TO THE STUDY

## A. Background

In 1987 the State of Colorado enacted a safety belt law. The law states that, except for children required to be restrained by a child restraint system, each driver and front seat occupant of a motor vehicle equipped with a safety belt system shall wear a safety seat belt while the vehicle is being operated on a street or highway. Exempt from the law are: (1) a peace officer performing official duties; (2) a member of an ambulance team other than the driver; (3) a driver or front seat occupant with a disabling condition who possesses a written verification from a physician that he such restraint is inappropriate; (4) a rural letter carrier while operating any motor vehicle during the performance of duties; (5) a person operating a motor vehicle for commercial or residential delivery; and (6) a person driving or riding in a motor vehicle not equipped with a safety belt system due to the fact that the federal law does not require the vehicle to have such a system.

The State of Colorado, with the support of the National Highway Traffic Safety Administration (NHTSA) of the U.S. Department of Transportation, will conduct observational surveys to evaluate the impact of the law on the usage of safety belts. The first survey will take place from August 6 through August 31, 1990.

The sample design for the survey consist of a multi-stage area probability sample of road segments with counts of vehicle occupants with and without safety belts obtained by observation at sample locations. The use of probability samples is an innovative approach introduced in NHTSA supported surveys for estimating safety belt usage rates. Traditionally, surveys on usage of safety belts by passengers of automobiles have been conducted by telephone interviews, through observation at purposively selected traffic intersections, or at shopping centers in predesignated cities.

The data collection approach that will be implemented in the Colorado safety belt usage survey, based on scientific probability-sampling methods, allows computation of the precision of survey estimates and projection of the results to areas not included in the sample. Furthermore,

restricting the sample of neighborhood roads to compact geographic clusters – Census tracts –[1] results in a more efficient data collection effort without sacrificing the projectability of the results to areas of the State not included in the sample.

## B. Summary of the Survey Design

The sample consists of 600 observation time periods. Observations are conducted at sample road intersections (sites). For purposes of the survey, an observation time period is a 40-minute time period in which belt usage is observed at a specific site. Generally, a particular site will be observed at more than one time period.

Once a random sample of counties was selected, the selection of the sample sites was carried out as follows. For purposes of sample selection, roads were grouped into two strata: (1) major roads (State, U.S. and Interstates), and (2) local roads. As depicted in Figure I-1, in sample counties the major roads were sampled across the entire county, while the local roads were selected from within small geographic areas – Census tracts/EDs.

The sample of major roads was selected taking into account a road's length and volume of traffic. First, using the CORIS database all road segments in the sample counties were identified and then a sample of segments was selected for observation. The local roads were selected within sample tracts and the number of tracts selected was proportional to the population of the county. A total of 180 sites (road segments) on major roads and 124 sites on local roads were drawn.

For each sample site at the location where the observation is to take place, we randomly assigned a traffic direction to be observed. The traffic is always observed in the direction coming from inside the sample road segment at or near the point where the traffic is leaving the segment.

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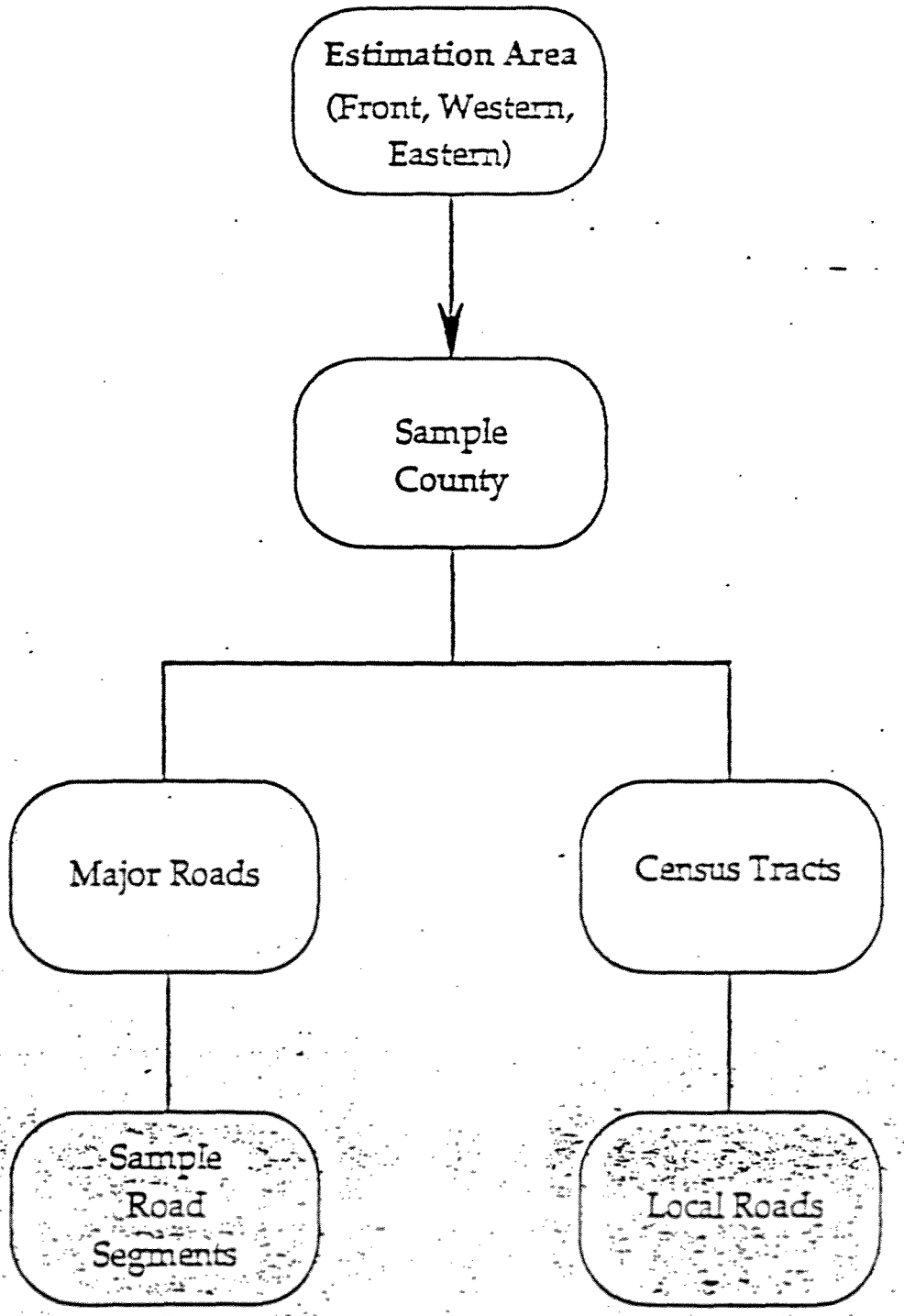
[1] A Census tract is an area which generally contains between 3,000 and 7,000 residents and is usually defined by stable boundown, i.e., rivers, railroad tracts or principal roadways.

Figure I-1 Sample Design Summary



## II. FIELD MATERIALS

WCG has prepared descriptions of the observation sites and maps showing the exact location of each site as well as the traffic direction to be observed. This section describes these materials.

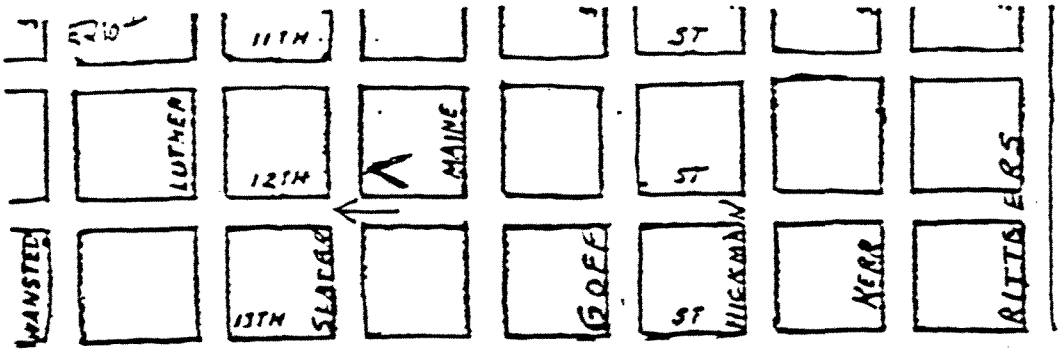
### A. Description Sheets

The description for an observation location gives the intersection at or near where the observation is to be conducted. An example of a description sheet is shown in Exhibit II-1. The first road named indicates the road segment of interest, that is, the road on which belt usage will be observed. The second road named is the intersecting road which marks the end of the segment. For example, in the description of site E112, belt usage is to be observed in vehicles traveling on State Highway 96 at the intersection with County Road 27.

The following list contains abbreviations used in the major road descriptors:

| | | |
|---|---|---|
| STR | - | Structure, (i.e., bridge, overpass or underpass) |
| CL | - | City Limits |
| SH | - | State Highway |
| CO | - | County |
| (D-16-C) | - | Parenthesis containing this similar sequence refer to the points of reference on the Colorado State Map. |
| SH 2 NE RD SE | - | The RD SE indicates there is an intersecting road other than the first one listed (SH 2 NE). The name of the second intersecting road is usually given in parenthesis at the end of the description. |
| IR | - | Indian Reserve |
| NF | - | National Forest |
| RRF | - | Railroad Crossing |

The direction of the traffic is not explicitly specified in the description, but it is indicated on the map by the direction of the arrow marking the intersection. Referring to the map below, notice that a road segment is the piece of road between two intersecting streets. Belt usage will be observed for eligible vehicles on 12th Street and the observer will stand at the corner of 12th and Slater Street. The arrow indicates both the side of the road on which the observer is to stand and the direction of the traffic to be observed. Standing at this point enables the observer to record or count seat belt usage in vehicles coming from inside the segment at or near the point where the vehicles are leaving that segment.




## B. Maps for Major Roads

Major roads are identified on county level maps. Each map displays a sample county. As shown in Exhibit II-2, each site on the map is identified with an arrow and a site number. The arrow indicates the traffic direction to be observed. The site number is a four-digit identifier that ties the observation points to the region and site description (see Section II-A). The first character of the site number identifies the region (Frontal, Western, Eastern) and the other three characters are assigned sequentially within road type. Major roads are assigned sequence numbers from 101 to 199.

## C. Tract Maps for Local Roads

As indicated earlier, local roads were sampled within sample Census tracts and Enumeration Districts (EDs). On each map the tract or ED is highlighted in yellow. The arrow again indicates the traffic direction to be observed. Sites on local roads are assigned a sequential number from 201 to 299 within region. A typical census tract map is shown in Exhibit II-3.

## D. Schedule Sheet

Based on the number of observations in your assigned county, we have prepared a schedule that indicates the day, time and site number of your assignments (see Exhibit II-4). You will follow this schedule in terms of the day, time, and particular road segment to be observed during a given observation period. Substitutions – observing traffic on a different road than that specified – are not acceptable because sites have been selected and assigned to days of the week and times of the day by probability methods. However, if for a given road it is not possible to observe at the intersection indicated in the descriptor – because of construction or because it is not safe – you may conduct the observation at a nearby location on that road. Also, if on a one-way street the direction indicated by the arrow contradicts the traffic flow, ignore the direction specified by the arrow.

Exhibit II-1 Kiowa County Site Descriptor

| ROAD ID | DESCRIPTION |
|---|---|
| | COUNTY: KIOWA (61) |
| E112 | SH 96 at Rd N and S (CO RD 27) (Galatea) |
| E113 | SH 96 at Major STR (K-26-C) Rush Creek |
| E114 | SH 96 at Enter Sheridan Lake CL (Pop 87) |
| E115 | SH 96 at JCT SH 385 N Rd S (Colorado Ave) |
| E116 | SH 96 at Rd S (CO RD 78.5) (Towner) |
| E117 | SH 287 at Prowers-Kiowa County Line Rd E and W (Kiowa CO RD A) |
| E118 | SH 287 at Ramp On JCT SH 96 NE |
| E119 | SH 287 at Rd N and S (Maine Street) |
| E120 | SH 287 at JCT SH 96 W Rd S (Wansted Street) |
| E121 | SH 287 at Major STR (J-25-A) Rush Creek |
| E122 | SH 385 at Prowers-Kiowa County Line Rd W Prowers Co RD W |
| E209 | 11th Street at Kerr Street |
| E210 | Wansted Street at 10th Street |
| E211 | 14th Street at Kerr Street |
| E212 | Lowell Avenue at Maine Street |

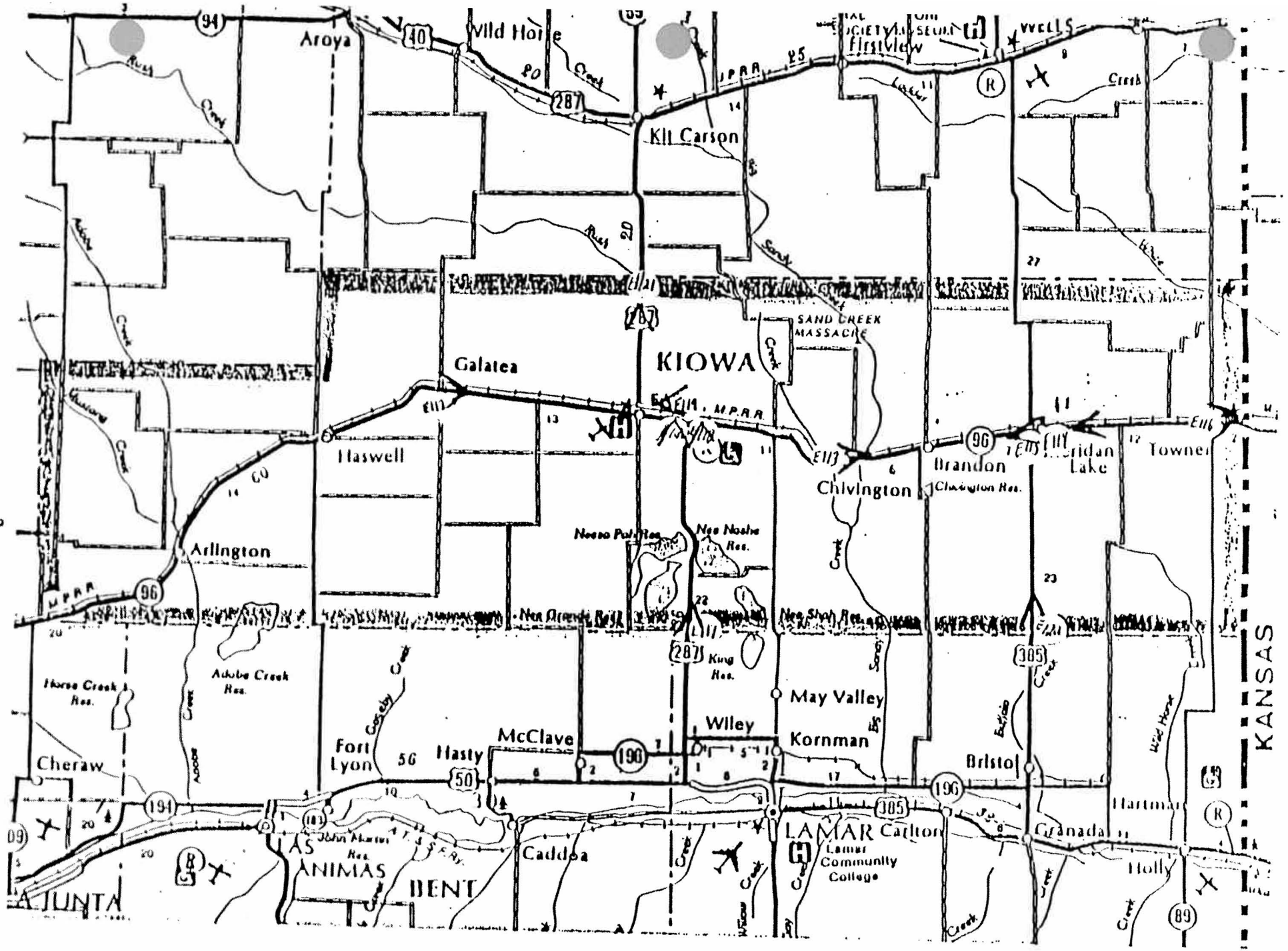
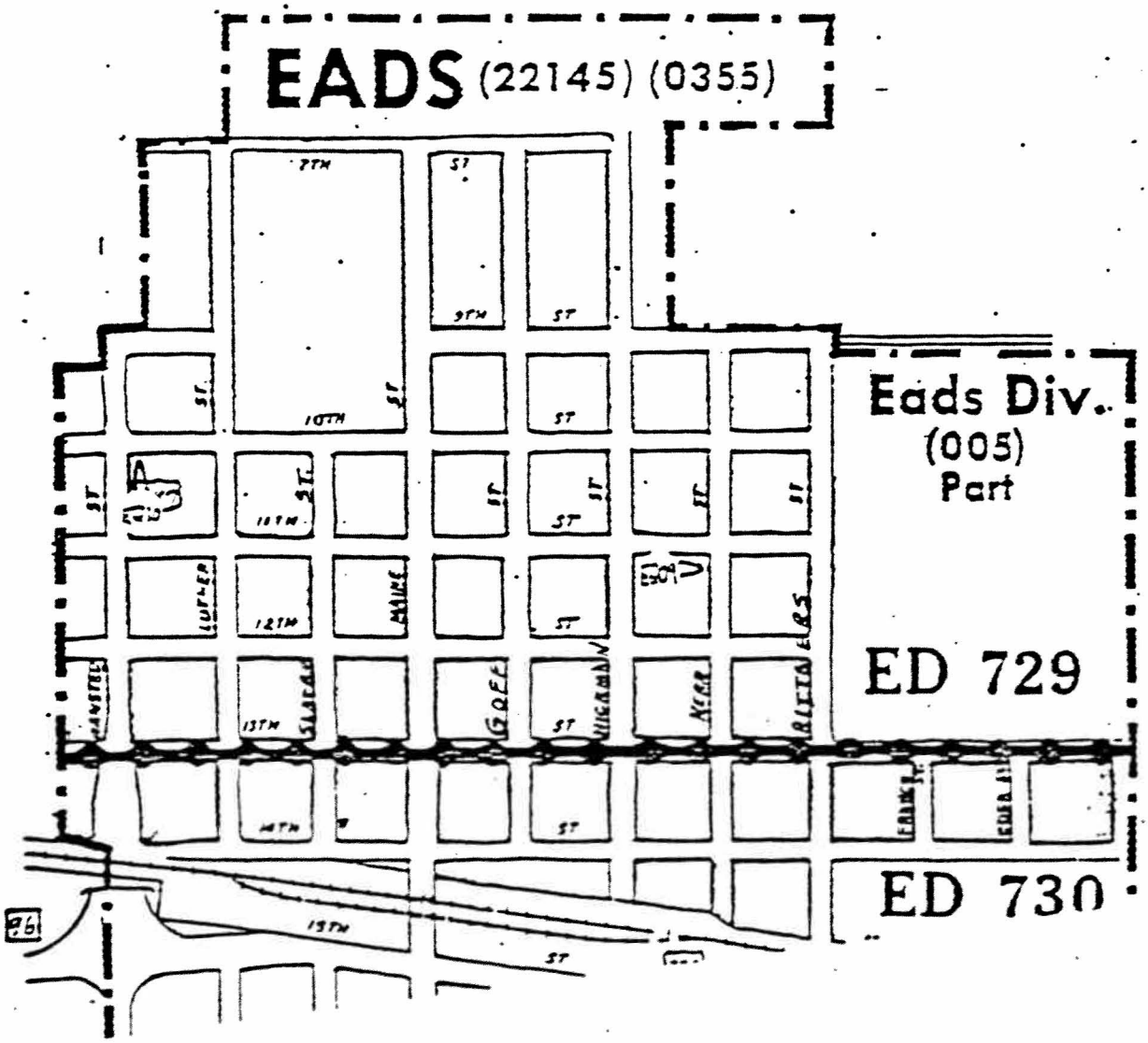



Exhibit II-2 Map For Major Roads

Exhibit II-3 Map for Local Roads



# Colorado Observational Survey

## Kiowa County (61)

Schedule for Observer: Michael Smith (12)

| Date | 8:00 AM – 9:00 AM | 9:00 AM – 10:00 AM | 10:00 AM – 11:00 AM | 11:00 AM – 12:00 PM | 12:00 PM – 1:00 PM | 1:00 PM – 2:00 PM | 2:00 PM – 3:00 PM | 3:00 PM – 4:00 PM | 4:00 PM – 5:00 PM |
|---|---|---|---|---|---|---|---|---|---|
| 8-5-90 | E113 | E119 | E210 | E116 | E211 | LUNCH | E122 | E115 | E117 |
| 8-6-90 | E212 | E114 | E118 | E112 | LUNCH | E121 | E209 | E120 | |

Exhibit II-4 Schedule for Observer

## III. CONDUCTING THE OBSERVATIONS OF SAFETY BELT USAGE

The Traffic Recording Sheet shown in Exhibit III-1 will be used to record total counts of front seat occupants using and not using shoulder belts.

### A. Eligibility

In recounting belted and unbelted front seat occupants you will follow the eligibility rules specified below:

- Eligible vehicles include private automobiles, vans and trucks. Excluded will be buses and commercial trailers, police vehicles, ambulances, postal delivery vehicles in rural areas, and delivery vehicles.
- Belt usage will be observed for front seat occupants only. If there is more than one front seat passenger observe only the "outside" passenger; and
- If a child is present in the front seat in a child restraint seat, do not record anything. However, children riding in the front seat, regardless of age, who are not in child restraint seats should be observed as any other front seat passenger.

### B. Counting Procedure

The following procedures will be used in conducting observations of safety belt use:

- Hold one counter in each hand designating one for counting belt use and the other for counting no belt use. As you observe an eligible vehicle record (click on the appropriate counter) the number of front seat occupants (drivers and outside passengers only) wearing and not wearing shoulder belts.
- If you notice a lap belt in use, it should not be recorded as using a safety belt. Only shoulder belts are to be counted. Lap belt use should be recorded as not wearing a shoulder belt.

# COLORADO SEATBELT USAGE
## TRAFFIC RECORDING SHEET

County Name: Larimer

County Code: POINT USER

Name: Nelson Code: none

| # of Lanes / Lanes Observed | Site Number | Weather | Speed | Time Began | Road Name | Intersecting Street |
|---|---|---|---|---|---|---|
| 3 / 1 | F 101 | 2 | 2 | 9:00 a.m. | Harmony | LeMay |
| 1 / 1 | F 201 | 3 | 1 | 10:00 a.m. | Remington | Lake |

OBSERVATION SUMMARY

| CARS | | TRUCKS | | Top row cars, Bottom Trucks | | |
|---|---|---|---|---|---|---|
| | | | | Ages | | |
| Yes | No | Yes | No | 16-25 | 25-50 | >50 |
| 94 | 39 | | | | | |
| 35 | 24 | 17 | 21 | 28 | 17 | 14 |
| | | | | 7 | 19 | 12 |

WEATHER CONDITIONS

1 = Clear 3. Snow

2 = Rain 4. Fog

Code

MPH 2. 31-50 MPH 3. > 50 MPH

DATE: Record date as MM/DD
e.g. Nov 17 = 11/17

TIME: Record using 12-hour clock
DO NOT use 24 hour clock
e.g. 2 PM = 2.00, NOT 14.00

place any comments on the back of this form.

- Note that if the vehicle is equipped with shoulder belts and the person has the belt buckled but has the shoulder strap under his/her arm, this person is not considered to be wearing a shoulder belt.

- Determine how many of the lanes with traffic in the assigned direction you can observe. Observe traffic only on these lanes throughout the observation time period. If you can observe only one lane, designate the lane closest to you as the observation lane.

- For safety reasons, you will observe belt use on interstates from an exit ramp or overpass.

- In most situations it should be possible to observe every vehicle in the designated lane. However, if traffic is moving too fast to observe every vehicle, you should determine which vehicle can be observed, i.e., every second car, every third card, etc. This pattern must be followed for the whole period and noted in the comments section of the form.

- At the end of the observation period, obtain from the counters and record on the form the number of persons observed using shoulder belts and the number observed not using shoulder belts. If no eligible vehicles were observed during the 40-minute observation time period, record zero for "using" and "not using should belt" and record zero for the speed but record all the other information specific to that observation time period.

## C. Using the Traffic Recording Sheet

Essentially, each Traffic Recording Sheet summarizes your assignments for a whole day. However, if you work in more than one county on a given day, you should use a separate recording sheet for each county.

Item-by-item recording instructions are provided below. The item numbers refer to the numbers shown in Exhibit III-2.

| | |
|---|---|
| **Item 1 - County Name and Code:** | Enter the county name and county code (from the description sheet). Remember that all results recorded on a given sheet should relate to the same county. |
| **Item 2 - Observer Name and Code:** | Enter your name and your assigned observer code (shown at the top of the schedule sheet). |
| **Item 3 - Date:** | Date (MM/DD) observation is being conducted. For instance, 04/14. |

COLORADO SEATBELT US[illegible]
TRAFFIC RECORDING SHEET

County Name: (1)

County Code:

[illegible] Name: (2) Code:

| # of Lanes (Lanes Observed) | Site Number | Weather | Speed | Time Began | Road Name | Intersecting Street | OBSERVATION SUMMARY: CARS Yes | CARS No | TRUCKS Yes | TRUCKS No | Top tow cars & pickup Trucks: Ages 16-24 | Ages 25-40 | Ages > 40 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (12) (13) | (4) | (6) | (5) | (7) | (8) | (9) | (10) * | (11) * | (10) | (11) | | ** | ** |
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WEATHER CONDITIONS

1 = Clear 3. Snow

2 = Rain 4. Fog

[illegible]

[illegible] 2. 31-50 MPH 3. > 50 MPH

[illegible] any comments on the back of this form.

* Has both Cars + High Speed Totals

DATE: Record date as MM/DD
e.g. Nov 17 = 11/17

TIME: Record using 12 hour clock
DO NOT use 24 hour clock
e.g. 2 PM = 2.00, NOT 14.00

** Age

**Item 4 - Site Number:** Transfer the site number from your schedule or assignment sheet.

**Item 5 - Road Speed:** Record the appropriate code, shown at the bottom of the sheet, to indicate approximate average speed you think the vehicles along this road are traveling. We are not interested in the speed limit since this can be obtained from other sources. In recording speed for an interstate you should record the speed of vehicles on the interstate not that of vehicles on the exit ramp.

**Item 6 - Weather Conditions:** Record the weather conditions during the observation period using the codes shown at the bottom of the sheet. Obviously, you could have different weather conditions entered on the sheet if the weather changes between observation periods.

**Item 7 - Time Began:** Record the time you began the observation. Follow the format HH:MM. Do not use military time.

**Item 8 - Road Name:** Record the name of the road on which you are observing belt use, from your assignment sheet.

**Item 9 - Intersecting Street Name:** Record the name of the intersecting street, from the assignment sheet.

Observation Summary

**Item 10 - Using Shoulder:** From the counter on which you have been recording occupants using a shoulder belt, record this number from the counter. Note that lap belts in use should not be recorded as "using shoulder." Lap belt use should be recorded as "not using shoulder."

**Item 11 - Not Using Shoulder:** From the counter on which you have been recording occupants not using shoulder, record this number from the counter.

**Item 12 - Lanes In Direction of Traffic:** Record the total number of lanes with traffic traveling in the direction you are observing.

**Item 13 - Lanes Observed:** Enter the total number of lanes observed at this observation site. Note that this number must be smaller or equal to number of lanes with traffic traveling in the direction you are observing. In most cases it will be one.

# SEATBELT USAGE FIELD SURVEY

SITE INFORMATION

| Site Number: | Observer: |
|---|---|
| F201 | Nelson |

Site Location: Remington @ Lake

Date (Month/Day/Year): 4-5-93

Day of Week: M T (W) R F S N

Weather: Clear / Rain / (Snow) / Fog

Speed: (0-30) / 31-50 / >50

Start Time: 10:00 (a.m.) p.m.

End Time: 10:40 (a.m.) p.m.

| Obs # | CARS | | | | | | | LIGHT TRUCKS | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Driver | | Passenger | | Driver age | | | Driver | | Passenger | | Driver age | | |
| | Yes | No | Yes | No | 16-25 | 25-40 | 40+ | Yes | No | Yes | No | 16-25 | 25-40 | 40+ |
| 1 | ✓ | | | ✓ | ✗ | | | | | | | | | |
| 2 | | ✓ | | ✓ | | ✗ | | | | | | | | |
| 3 | ✓ | | | | | | ✗ | | | | | | | |
| 4 | ✓ | | | | | | ✗ | | | | | | | |
| 5 | | | | | | | | ✓ | | | | ✗ | | |
| 6 | | | | | | | | | | | | | | |
| 7 | | | | | | | | | ✓ | | ✓ | | ✓ | |
| 8 | ✓ | | | ✓ | | ✗ | | | | | | | | |
| 9 | | | | | | | | ✓ | | | | | ✗ | |
| 10 | ✓ | | | | ✗ | | | | | | | | | |
| 11 | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | | | |
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| 16 | | | | | | | | | | | | | | |
| 17 | | | | | | | | | | | | | | |
| 18 | | | | | | | | | | | | | | |
| 19 | | | | | | | | | | | | | | |

1993 Supplemental Analysis of Truck Belt Usage
for 1993 Seat Belt Survey

| | | | | |
|---|---|---|---|---|
| Total Truck Observations - | 3702 | | | |
| Total drivers and passengers wearing belts - | 1365 | 37% | UCL 39% | LCL 35% |
| Total drivers and passengers not-wearing belts- | 2337 | 63% | UCL 65% | LCL 61% |

We believe this to be an accurate representation of observed seatbelt usage patterns for non-commercial truck users in Colorado on a State-Wide basis.

County numbers are provided showing actual count and percents only. The reason for this is that the use of the new form was optional to observers, and the usage (or non-usage) of the form between counties varied so much that some distortions may present themselves in further analysis. Examples of this are the large count in tiny Montezuma county and the small count in Denver county. Any projections beyond the data as presented may be difficult to support and project from.