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DIRECT OBSERVATION OF SEAT BELT USE IN MICHIGAN: DECEMBER 1986

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16. Abstract

Results of a direct observation study of seat belt use in Michigan conducted in December 1986 were compared with results of previous surveys in December 1984, April 1985, July 1985, December 1985, April 1986, and July 1986. In the current survey, 17,361 occupants in 12,283 cars and light trucks were observed between December 1 and December 21, 1986. Seat belt use in December 1986 decreased only marginally from the level observed in July 1986. Front-seat restraint use among all motorists observed was 44.7% in December 1986, compared to 47.1% in July 1986. The decrease is not statistically significant, since the estimates have a margin of error of ± 2%. Use rates declined slightly within all age groups from the previous survey wave and were as follows in December 1986 (all seat positions): 67.0% among occupants age 0-3; 34.1% among occupants age 4-15; 38.1% among occupants age 16-29; 44.5% among occupants age 30-59; and 53.1% among occupants age 60 and older. Females continued to exhibit a higher restraint use than males, 49.6% vs. 38.7% in the current survey. As in previous surveys, restraint use varied by region of the state. Seat belt use has remained relatively stable since December 1985 when use among front-seat occupants was 44.5%. Finally, front-seat belt use among those age 16 and over remains significantly higher than it was before Michigan's mandatory use law took effect (44.3% in December 1986, versus 18.3% in December 1984). Additional surveys are scheduled for April and July 1987.

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1 INTRODUCTION

The Michigan mandatory seat belt law, implemented in July of 1985, is one of 25 similar laws in the United States intended to reduce motor vehicle crash-related deaths and injuries.[1] The success of these laws in preventing injury and death, however, has not been uniform, due to varying levels of compliance attained in these states. The Insurance Institute for Highway Safety, for example, found that the pattern of reductions of front-seat occupant fatalities in New York, Michigan, Illinois, and New Jersey in 1985 was consistent with observed changes in seat belt use in those states since implementation of compulsory use laws (Insurance Institute for Highway Safety, 1986a). Compliance with mandatory belt laws has also varied **within** states over time. Although the short-term trend following such legislation has generally been a sharp increase in belt use immediately following implementation of such laws followed by a partial decline over the subsequent six to twelve months, belt use in some states has exhibited a departure from this pattern. In Austin, Texas, for example, the sharp increase in belt use observed immediately after enforcement of the law began was still evident six months later (Bunch and others, 1986). These differing trends over time have implications for expected reductions in motor vehicle crash-related deaths and injuries. Consequently, evaluation of the success of mandatory seat belt laws should include an understanding of trends in belt use.

In order to measure compliance with Michigan's seat belt law, The University of Michigan Transportation Research Institute is conducting a series of direct observation surveys of seat belt use among motor vehicle occupants throughout the state. Two survey waves (December 1984 and April 1985) were conducted prior to implementation of the law and provide a base against which effects of the law are assessed. The third wave was conducted in July 1985 immediately following implementation of the law. The fourth, fifth and sixth waves were conducted in December, 1985 and April and July 1986 respectively, five, nine and twelve months after the law took effect. The seventh survey wave reported here covered the period from December 1 to December 21, 1986, 17 months after the Michigan law was implemented. Each of the surveys examined restraint use by a number of variables including age, sex, seating position, time of day, day of week, type of roadway, weather conditions, vehicle type and size, and region of the state. Readers are referred to

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1. A total of 27 such laws had been passed at the time of the July 1986 survey wave. Two have since been repealed (Nebraska and Massachusetts).

previous reports for complete results of the previous surveys (Wagenaar and Wiviott, 1985a; Wagenaar, Wiviott, and Compton, 1985; Wagenaar and Wiviott, 1985b; Wagenaar, Wiviott, and Businski, 1986; Wagenaar, Businski, and Molnar, 1986a; and Wagenaar, Businski, and Molnar, 1986b). In the current report, restraint use in December 1986 is compared with the results of previous survey waves. Additional survey waves are scheduled for April and July, 1987.

2 METHODS

To ensure comparability across all survey waves in this series, the same methods were used in each wave. A few minor differences in the current wave are noted in this section. For a detailed discussion of the sample design, data collection procedures, and analytic procedures used throughout the series of survey waves, the reader is referred to the first report of this series (Wagenaar and Wiviott, 1985a).

As in previous survey waves, motor vehicle occupants at a carefully selected probability sample of 240 intersections throughout the State of Michigan were observed by trained field observers. Observers recorded restraint use, seat position, estimated age, and sex for occupants in **all** seating positions in each sampled vehicle. The size and type of vehicle was also recorded.

Detailed information on the seating positions of all occupants was recorded, including those in nonstandard seating positions. Specifically, observers noted whether passengers were sitting, standing, kneeling, or lying on the seat, floor, or cargo area of the vehicle. Passengers riding in the lap of another occupant were also recorded. The objective was to collect data on the full complement of restraint use and related information for all occupants of vehicles included in the sample.

Beginning in the July 1985 wave, observers were instructed to record incorrect use of seat belts. Examples of incorrect belt use included: positioning the shoulder harness under the outboard arm, behind the back, or over the inside shoulder; and restraining two occupants with one seat belt. The category of incorrect belt use did not include occupants (typically in the 4-15 age group) who were too short to wear a shoulder belt in the correct position across the chest. Often such occupants placed the belt behind the back. These occupants were coded as correctly belted. Occupants incorrectly using seat belts were coded as "belted" and, therefore, appear in the tables and figures below as restrained. However, incorrect use of belts was recorded to assess the extent of incorrect use and to permit further analyses of occupants who use seat belts incorrectly.

Observers limited the number of vehicles recorded during any given signal cycle to three. This procedure was adopted during the July 1985 wave. After the mandatory use law took effect, occupants in long traffic queues buckled up after noticing the observer examine

vehicles ahead of them in the queue. Recording data on only the first three vehicles prevented inclusion of these occupants in the survey.

The sample of 240 sites was identical to all previous survey waves except July 1986 when two alternative sites were used. Two full-time observers from two previous waves and one new observer were hired to conduct field observations. One full-time staff person with previous experience as an observer conducted field observations and had responsibility for quality assurance of field data. All field personnel were spot checked in the field by a senior staff member. Field personnel attended a three-day training session in which data collection policies and procedures were reviewed (components of the training program were described in the first report of this series; Wagenaar and Wiviott, 1985a).

The first observer visited 76 sites, the second 64 sites and the third 77 sites. The remaining 23 sites were observed by a senior staff person. Beginning in the April 1985 wave, two-person teams were used to observe certain central city sites due to safety considerations. In the current wave, the number of central city sites observed by two-person teams increased, although the methods for data collection remained the same. At each site two observers collected data at the same intersection but from different paths of traffic. Each observer recorded half of the required vehicles at each site. Using two-person teams for central city sites allowed for efficient and rapid collection of data while providing security for the observers. All other sites were observed by a single person.

Descriptive statistics for the 240 observation sites are shown in Table 2.1. The distributions of site observations by day of week and hour of day were similar to previous survey waves conducted in the month of December. Fewer early morning and late afternoon/evening observations were made during December than other months because of fewer hours of daylight available. The distribution of site observations by weather conditions differed only slightly from that of the December wave a year ago in that there were more observations made under sunny conditions (17.5% in the current wave vs. 8.3% in the December 1985 wave). There was also a decrease in observations under snowy conditions from a year ago (22.5% in the current wave vs. 32.5% in the December 1985 wave). These differences were due to milder weather conditions during December 1986 than December 1985.

Actual numbers of cases observed across categories of the major variables are shown in Table 2.2. Restraint use estimates based on small numbers of cases, such as those for occupants in extra seats and cargo areas, need to be interpreted with care.

TABLE 2.1
Descriptive Statistics for the 240 Observation Sites

Day of Week		Start Time		Site Choice		Weather		Observer	
Monday	14.2%	7-10 AM	19.5%	Primary	100.0%	Sunny	17.5%	(A)	31.7%
Tuesday	13.8%	10-12 AM	28.0%	Alternate	0.0%	Cloudy	52.5%	(B)	26.7%
Wednesday	14.6%	12-2 PM	23.4%			Rain	7.5%	(C)	32.1%
Thursday	15.0%	2-4 PM	21.3%			Snow	22.5%	(D)	9.6%
Friday	17.9%	4-6 PM	7.9%						
Saturday	13.3%								
Sunday	11.3%								
TOTALS	100%		100%		100%		100%		100%

TABLE 2.2
Sample Distributions for Major Variables by Seat Position, Unweighted Ns and Percent Missing Data

	Seat Position									
	Driver	Front Center	Front Right	Rear Left	Rear Center	Rear Right	Extra Seats	Cargo Area	Held in Lap	All[1]
Restraint Use										
None	6,720	143	2,058	220	139	407	17	25	42	9,784
Belted	5,559	27	1,541	76	42	92	3	0	0	7,340
CRD Correct	–	13	24	48	39	43	0	0	0	167
CRD Wrong	–	9	10	15	4	15	0	0	0	53
Missing	4	1	1	5	1	5	0	0	0	17
% Missing	0.0	0.5	0.0	1.4	0.4	0.9	0.0	0.0	0.0	0.1
Sex										
Male	7,442	78	1,218	186	131	259	4	14	22	9,357
Female	4,828	106	2,400	172	93	297	7	9	14	7,936
Missing	13	9	16	6	1	6	9	2	6	68
% Missing	0.1	4.7	0.4	1.6	0.4	1.1	45.0	8.0	14.3	0.4
Age										
0–3	0	74	119	106	90	113	0	3	39	548
4–15	1	59	382	151	104	191	18	19	3	936
16–29	4,001	38	1,071	51	20	116	1	2	0	5,301
30–59	6,910	18	1,479	37	8	96	1	1	0	8,550
60+	1,363	3	577	19	3	45	0	0	0	2,010
Missing	8	1	6	0	0	1	0	0	0	16
% Missing	0.1	0.5	0.2	0.0	0.0	0.2	0.0	0.0	0.0	0.1
Vehicle Type										
Small Car	3,172	5	826	111	56	175	0	1	9	4,357
Midsize Car	3,498	28	1,042	113	60	170	0	4	11	4,932
Large Car	3,190	68	1,071	108	82	172	2	5	9	4,708
Pickup	1,346	70	352	0	1	3	0	11	7	1,792
Van	652	3	200	19	15	22	13	4	4	933
Other	408	15	129	5	5	14	5	0	2	584
Missing	17	4	14	8	6	6	0	0	0	55
% Missing	0.1	2.1	0.4	2.2	2.7	1.1	0.0	0.0	0.0	0.3
Site Type										
Intersection	9,852	160	2,972	294	184	439	11	22	32	13,979
Freeway Exit	2,431	33	662	70	41	123	9	3	10	3,382
Missing	0	0	0	0	0	0	0	0	0	0
Day of Week										
Monday	1,734	15	374	39	16	49	0	1	2	2,230
Tuesday	1,697	19	408	37	17	59	1	2	3	2,244
Wednesday	1,772	36	488	34	24	78	2	0	9	2,444
Thursday	1,835	34	445	39	32	75	3	1	6	2,471
Friday	2,196	31	578	69	40	86	1	6	11	3,020
Saturday	1,659	29	695	70	49	112	1	6	5	2,633
Sunday	1,390	29	646	76	47	103	12	9	6	2,319
Missing	0	0	0	0	0	0	0	0	0	0

TABLE 2.2 Continued

	Seat Position									
	Driver	Front Center	Front Right	Rear Left	Rear Center	Rear Right	Extra Seats	Cargo Area	Held in Lap	All[1]
Time of Day										
7-9 AM	889	8	167	20	11	24	0	1	2	1,122
9-10 AM	1,350	17	295	24	17	37	0	0	2	1,744
10-11 AM	1,716	24	459	50	33	77	3	1	7	2,370
11-12 AM	1,753	23	522	57	40	83	0	6	9	2,495
12-1 PM	1,300	23	465	48	30	72	8	0	4	1,952
1-2 PM	1,339	24	444	45	25	78	2	4	11	1,973
2-3 PM	1,718	29	557	54	29	87	0	1	3	2,478
3-4 PM	1,138	26	366	37	18	58	4	6	1	1,659
4-5 PM	1,003	17	333	27	21	42	3	6	3	1,456
5-7 PM	77	2	26	2	1	4	0	0	0	112
Missing	0	0	0	0	0	0	0	0	0	0
Weather										
Sunny	2,157	28	672	68	50	102	3	2	10	3,095
Cloudy	6,492	108	1,894	184	114	304	15	12	20	9,152
Rain	914	3	274	19	4	34	1	9	3	1,261
Snow	2,720	54	794	93	57	122	1	2	9	3,853
Missing	0	0	0	0	0	0	0	0	0	0
MDOT Region										
Western U.P.	607	24	150	12	15	21	2	1	1	833
Eastern U.P.	410	16	121	16	6	21	0	1	2	594
Northwest	612	7	165	14	8	25	0	2	2	836
Northeast	408	16	176	22	14	15	1	1	2	657
West Central	1,434	20	475	35	16	52	0	10	4	2,050
East Central	1,422	44	490	58	48	91	4	2	8	2,169
Southwest	1,398	15	315	28	10	44	0	1	6	1,817
Southeast	1,224	7	301	35	16	49	0	2	5	1,640
Metro Detroit	4,768	44	1,441	144	92	244	13	5	12	6,765
Missing	0	0	0	0	0	0	0	0	0	0
TOTAL N	12,283	193	3,634	364	225	562	20	25	42	17,361

[1] Includes 13 occupants standing.

In addition to showing the actual number of cases by subcategory, Table 2.2 indicates the extent of missing data for each variable. The key restraint item was missing for only 0.1% of all occupants observed. These were cases in which the observer could not accurately identify whether the occupant was restrained. There were five cases of missing data on restraint use for the 12,283 drivers and 3,634 front-right occupants observed. Front-center and rear-seat occupants had low to moderate levels of missing data on restraint use (0.5% to 1.4%; see Table 2.2).

3 RESULTS

Seat belts or child restraint devices were used by 43.6% of all motor vehicle occupants observed during December 1986. By comparison, the use rate in the July 1986 survey wave was 45.3%[2] (Figure 3.1); this decrease in restraint use is not statistically significant (Z=0.99).[3]

The latest survey use rate supports earlier survey findings that restraint use has stabilized during the past year. In December 1985, five months after the mandatory seat belt law took effect, overall restraint use had declined to 43.0% from 58.4% in July 1985, immediately after the law took effect. Since that time, however, restraint use has changed little (43.7% in April 1986, 45.3% in July 1986, and 43.6% in December 1986). Furthermore, while restraint use in December 1986 was lower than the 58.4% peak restraint use rate observed in July 1985, it is still higher than it was before the law took effect. The December 1986 use rate of 43.6% represents a 120.2% increase from the December 1984 rate of 19.8%.

Table 3.1 provides summary information on restraint use by seat location (front and rear) for each major variable of the study including sex, age, type of vehicle, site type, day of week, time of day, weather, and region. As in previous surveys, restraint use was higher among front-seat occupants than rear-seat occupants (44.7% vs. 32.0%).

Young children have particularly high rates of restraint use as a result of mandatory child restraint legislation implemented in 1982 (Wagenaar, 1984; Wagenaar and Webster, 1986) and therefore exert an upward influence on overall use rates. Consequently, effects of the mandatory seat belt law on restraint use can be seen most clearly by including only motor vehicle occupants 16 years and older in the analyses. In December 1984, restraint use for adults (16 and over) was 18.3% among front-seat occupants and 7.2% among rear-seat occupants. A noticeable increase in belt use was seen in April 1985, after the law was enacted but before implementation. In July 1985, immediately after implementation, restraint use among front-seat occupants more than doubled, increasing to 60.5%. In December 1985, after five months of compulsory belt use, restraint use was down to 44.0%

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2. These numbers include both correct and incorrect use of seat belts and child restraint devices.

3. Calculation of Z statistics takes into account the design effect resulting from the multi-stage sampling procedure used. The design effect of the December 1986 wave was 10.0.

Figure 3.1: Overall Restraint Use

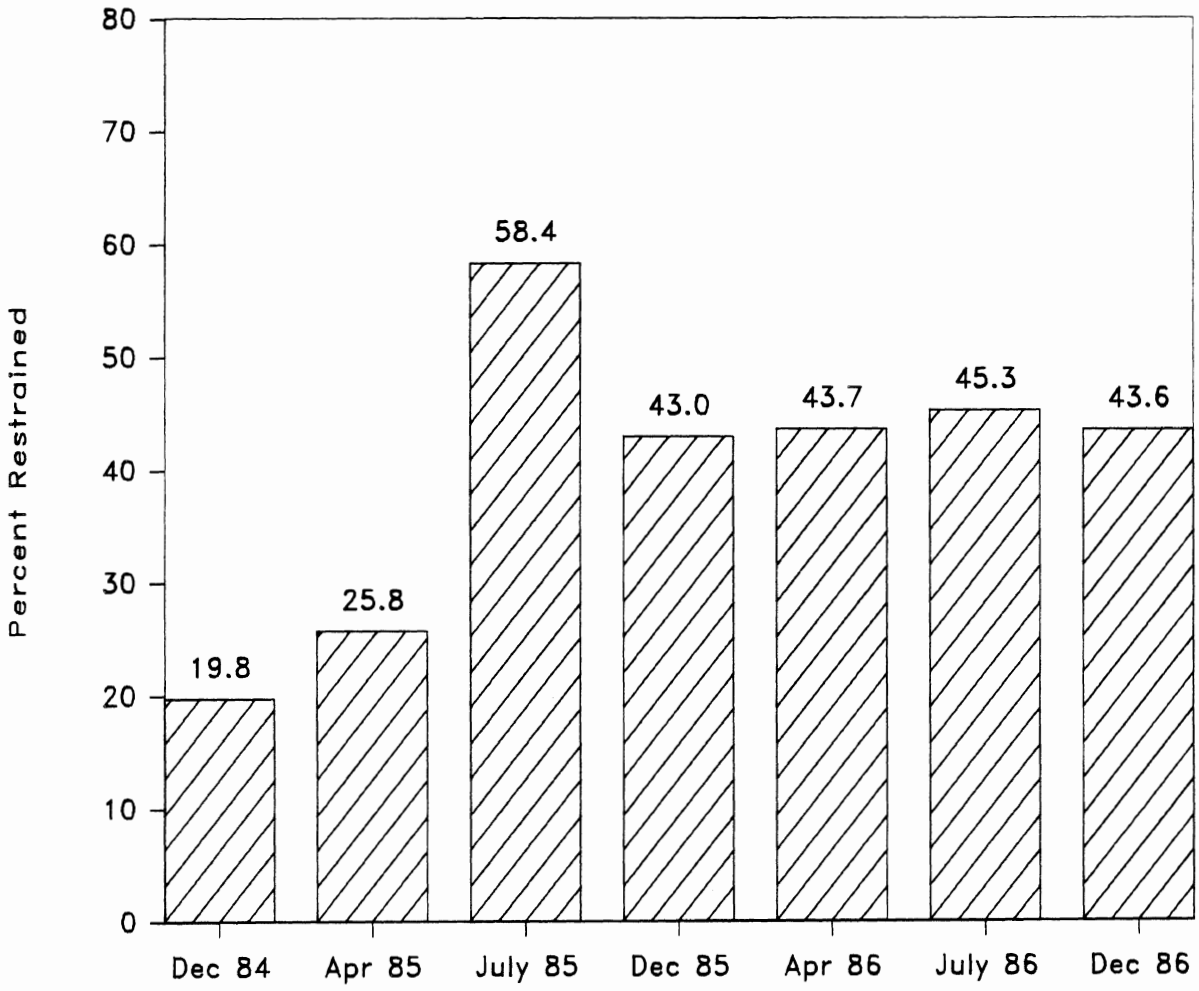

TABLE 3.1
Percent Restrained by Major Variables and Seat Location[1]

	Seat Location		
	Front Seat	Rear Seat	All[2]
Sex			
Male	39.2	33.3	38.7
Female	51.3	30.6	49.6
Age			
0–3	61.6	80.1	67.0
4–15	47.2	24.6	34.1
16–29	39.3	4.5	38.1
30–59	45.2	2.7	44.5
60+	54.7	8.0	53.1
Type of Vehicle			
Small Car	49.6	37.8	48.5
Mid-Sized Car	49.3	32.9	48.0
Large Car	41.3	23.8	39.9
Pickup Truck	31.1	0.0	30.7
Van	40.1	36.1	39.0
Other	44.7	33.1	43.8
Site Type			
Intersection	43.7	32.3	42.7
Freeway Exit	48.7	31.0	47.1
Day of Week			
Monday	49.7	45.5	49.5
Tuesday	45.3	32.6	44.6
Wednesday	44.9	18.6	43.1
Thursday	43.3	38.3	42.9
Friday	42.9	34.0	42.0
Saturday	42.2	26.9	40.6
Sunday	45.2	31.9	43.4

[1]All percents are based on analyses weighted according to the sample design to accurately represent the entire state. Restraint use includes correct and incorrect use of child restraint devices and seat belts.

[2]Includes occupants riding in third and fourth seats of station wagons and vans and in nonstandard seat positions (i.e., on laps, in cargo area, on floor).

TABLE 3.1 Continued

	Seat Location		
	Front Seat	Rear Seat	All[2]
Time of Day			
7-8 AM	48.0	0.0[3]	46.2
8-9 AM	50.8	41.4	50.2
9-10 AM	47.1	41.0	46.7
10-11 AM	45.8	35.8	45.0
11-12 AM	45.3	40.3	44.7
12-1 PM	43.5	22.1	41.5
1-2 PM	43.4	28.3	41.9
2-3 PM	44.6	36.2	43.9
3-4 PM	41.2	16.6	39.1
4-5 PM	42.8	31.2	41.6
5-6 PM	36.2	14.4	34.9
Weather			
Sunny	39.8	33.6	39.1
Cloudy	43.7	30.3	42.6
Rain	46.1	33.0	45.1
Snow	51.4	34.1	49.9
MDOT Region			
Western U.P.	48.8	42.7	48.5
Eastern U.P.	34.1	34.9	33.9
Northwest	47.6	46.7	47.2
Northeast	48.3	61.2	49.0
West Central	41.3	21.4	40.0
East Central	47.6	40.3	46.6
Southwest	47.4	15.1	45.7
Southeast	51.4	34.5	50.1
Metro Detroit	42.3	30.0	41.2
TOTAL	44.7	32.0	43.6

[1]All percents are based on analyses weighted according to the sample design to accurately represent the entire state. Restraint use includes correct and incorrect use of child restraint devices and seat belts.

[2]Includes occupants riding in third and fourth seats of station wagons and vans and in nonstandard seat positions (i.e., on laps, in cargo area, on floor).

[3]Based on only 1 observed case.

among front-seat occupants and 6.9% among rear-seat occupants. Adult restraint use remained essentially at those levels through April 1986--44.4% among front-seat occupants and 6.6% among rear-seat occupants. In July 1986, estimated adult restraint use increased slightly to 47.0% among front-seat occupants and 7.3% among rear-seat occupants. In the current survey wave, restraint use for adults was 44.3% among front-seat occupants and 4.6% among rear-seat occupants (Figure 3.2). While the current use rate among rear-seat adults is the lowest such rate observed throughout the series of surveys and appears to be substantially lower than the July 1986 rate, the decrease is not statistically significant (Z=0.52).

An examination of restraint use by vehicle seating position indicates that in all age groups restraint use was higher among drivers than occupants of other seating positions (Table 3.2). Furthermore, as in previous post-law survey waves, only drivers and front-right passengers had use rates which were substantially higher than those observed in December 1984 prior to enactment of the seat belt law. Occupants in all other seating positions had use rates comparable to pre-law levels (Figure 3.3). This finding is consistent with expectations, given that the law only applies to front-seat occupants.

Consistent with the overall trend in restraint use, all age groups exhibited marginal decreases in use from July 1986 (Figure 3.4); none of these decreases was statistically significant.[4] Restraint use remained highest among occupants aged 0-3, who have been required to be restrained when traveling in motor vehicles since 1982 in Michigan. A total of 67.0% of occupants 0-3 years were restrained, compared to 34.1% of occupants 4-15 years, 38.1% of occupants 16-29 years, 44.5% of occupants 30-59 years, and 53.1% of occupants 60 years and older (Table 3.2).

Incorrect use of safety seats among children age 0-3 declined slightly but continues to be a problem. A total of 24.4% of child restraint devices were observed to be incorrectly used in the current wave, compared to 28.1% in July 1986, 27.3% in April 1986 and approximately 20% in each prior wave. Because incorrect use was limited only to cases **obvious** to the observer (noting the data collection process used), data presented here should be considered a conservative estimate. A more detailed UMTRI study of restraint use among Michigan children under the age of four found that 62.9% of child restraint devices were incorrectly used (Wagenaar, Molnar, and Businski, and Margolis, 1986). Incorrect use of child restraint devices in that study was measured both by how the child restraint device was installed in the vehicle and how the child was positioned in the restraint device. Specifically,

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4. The Z scores are as follows: 0-3 years, 0.64; 4-15 years, 0.16; 16-29 years, 0.13; 30-59 years, 1.29; and 60 and over, 0.42.

Figure 3.2: Restraint Use by Seat Location

Occupants Age 16 and Over

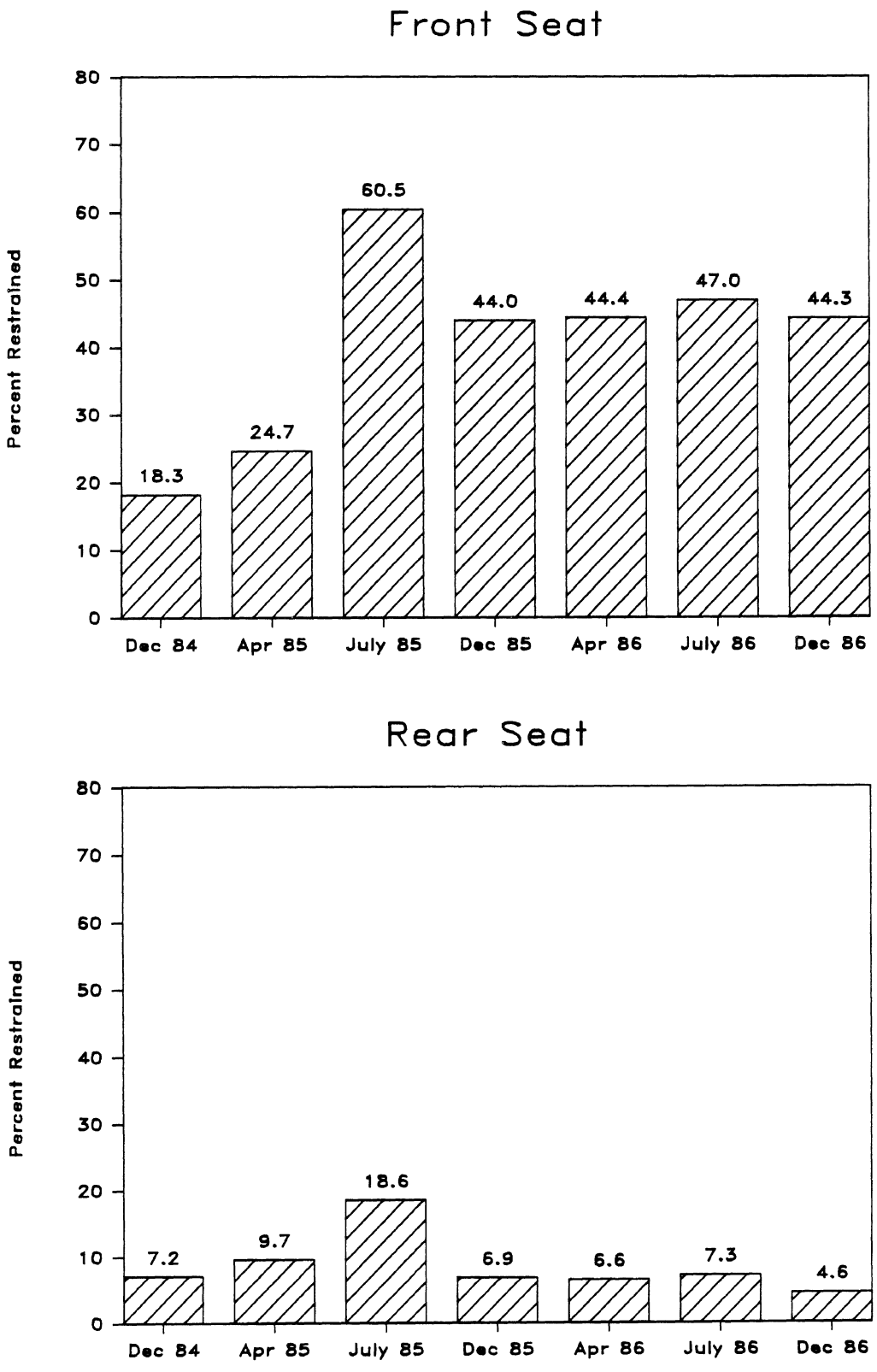


TABLE 3.2
Restraint Use by Age and Seat Position[1]

Age Group	Seat Position									
	Driver	Front Center	Front Right	Rear Left	Rear Center	Rear Right	Extra Seats	Cargo Area	Held in Lap	All[2]
Age 0–3										
% Belted	–	20.6	37.0	27.6	25.3	27.4	–	0.0	0.0	26.0
% Correct CRD	–	15.9	21.2	45.4	44.0	37.3	–	0.0	0.0	30.8
% Incorrect CRD	–	13.4	9.7	14.3	5.2	13.3	–	0.0	0.0	10.2
% Restrained[3]	–	49.9	67.9	87.3	74.5	77.9	–	0.0	0.0	67.0
Unweighted N	–	74	119	106	90	113	0	3	39	548
Age 4–15										
% Restrained	100.0	16.4	51.4	27.7	19.2	25.1	7.9	0.0	0.0	34.1
Unweighted N	1	59	382	151	104	191	18	19	3	936
Age 16–29										
% Restrained	41.1	2.8	33.8	2.3	5.4	5.3	0.0	0.0	–	38.1
Unweighted N	4,001	38	1,071	51	20	116	1	2	0	5,301
Age 30–59										
% Restrained	46.0	11.8	42.1	0.0	0.0	4.0	0.0	0.0	–	44.5
Unweighted N	6,910	18	1,479	37	8	96	1	1	0	8,550
Age 60+										
% Restrained	54.7	0.0	54.8	18.0	0.0	4.8	–	–	–	53.1
Unweighted N	1,363	3	577	19	3	45	0	0	0	2,010
All Ages										
% Restrained	45.4	24.9	43.4	37.5	37.8	26.1	7.0	0.0	0.0	43.6
Unweighted N	12,283	193	3,634	364	225	562	20	25	42	17,361

[1]All percents are based on analyses weighted according to the sample design to accurately represent the entire state. Unweighted Ns indicate the actual number of occupants observed in a given group.
[2]Restraint use for all positions includes cargo areas, passengers held in laps, and passengers standing.
[3]Percent restrained includes correct and incorrect CRD use.

Figure 3.3: Restraint Use by Seat Position

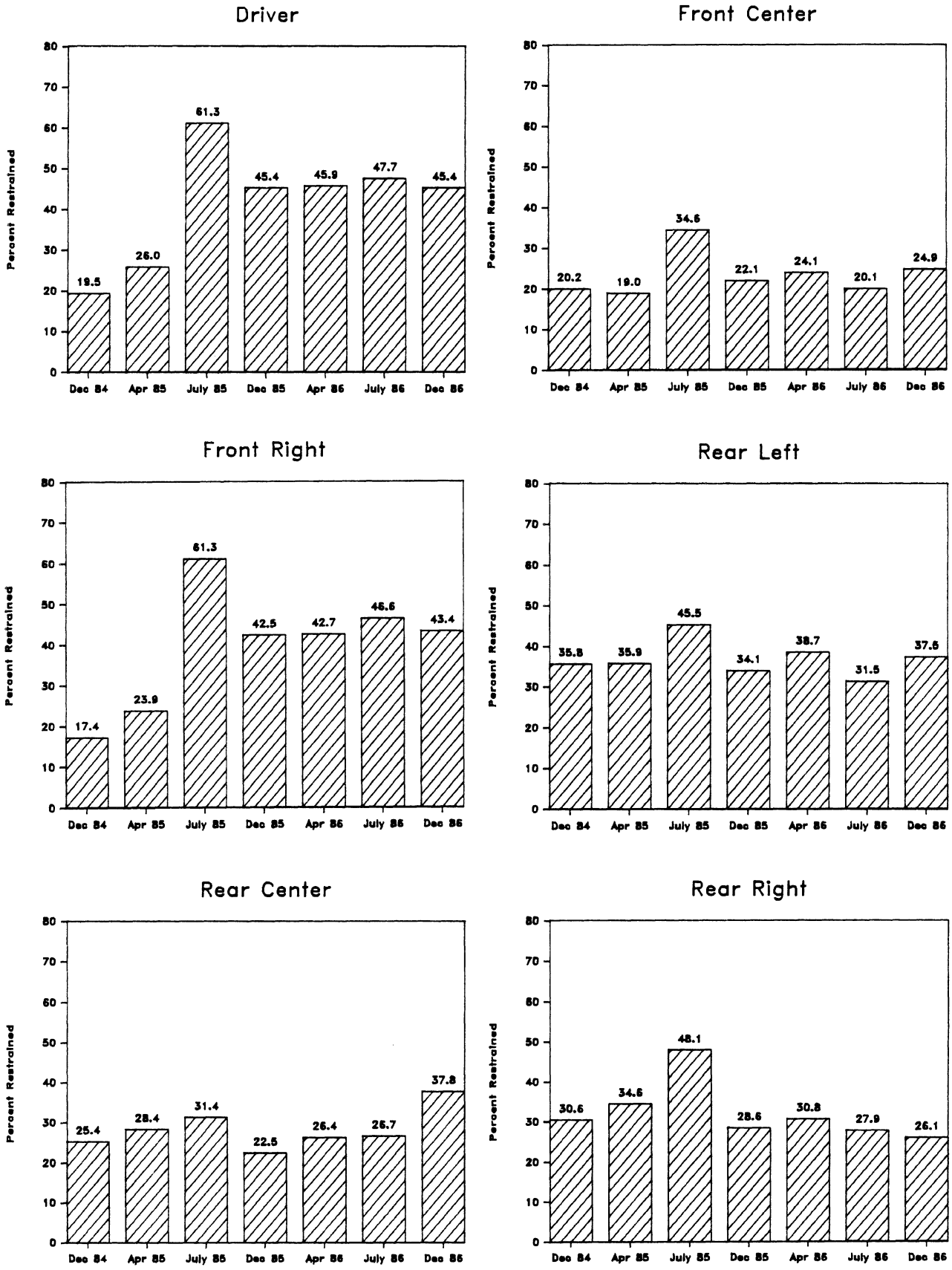
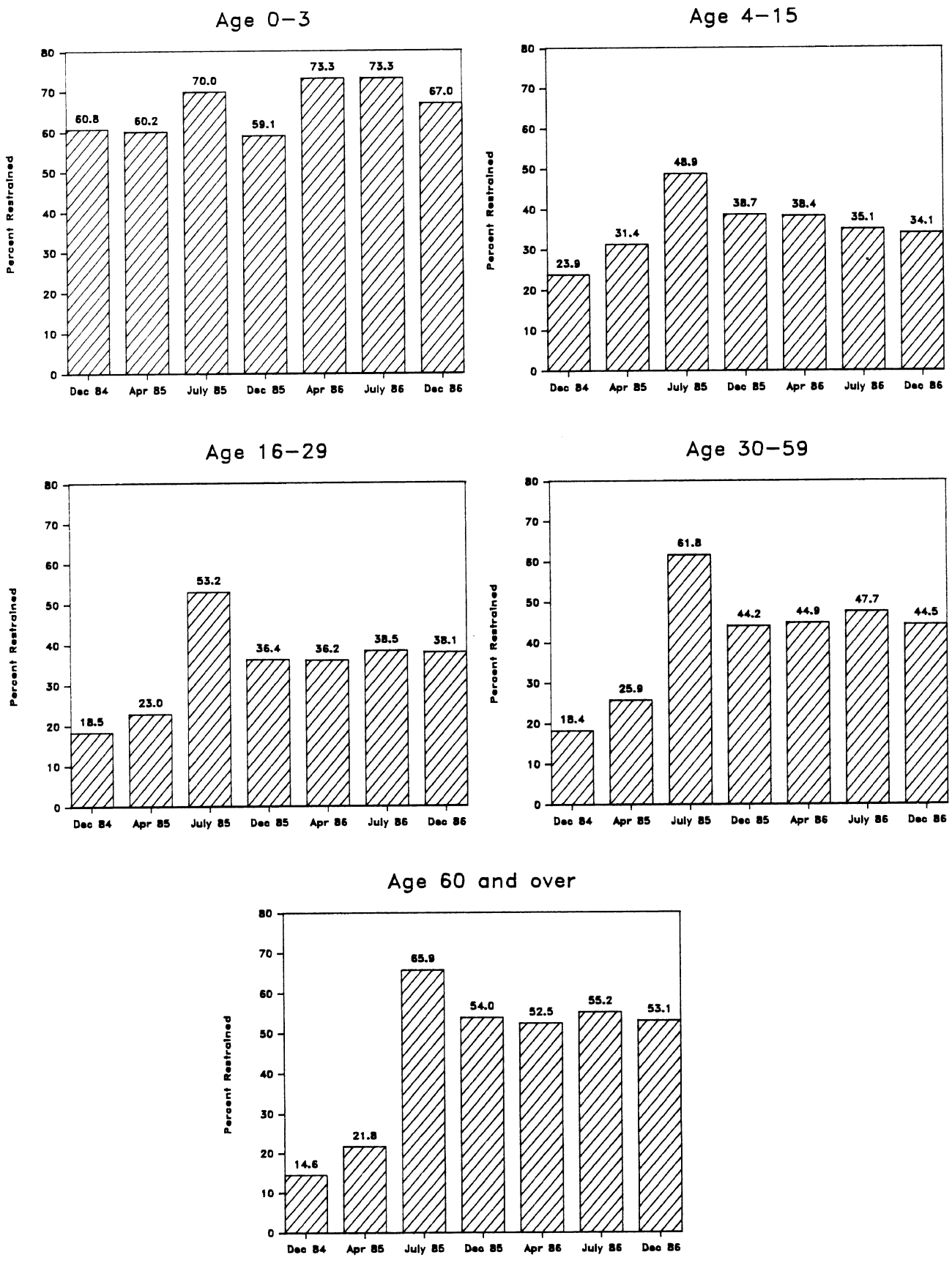


Figure 3.4: Restraint Use by Age



data were collected on the type of seat used, whether the automobile belt was fastened, snug, and routed correctly, whether a locking clip was used, and whether a tether was required, used, anchored, and anchored properly. Data were also collected on whether the shield and/or harness were used, whether the harness was snug, whether a harness clip was used, and the harness position. Findings from that study confirm that the problem of incorrect use remains pervasive.

As in previous survey waves, occupants age 60 years and older had a restraint use rate higher than any other age group except occupants age 0-3. Prior to enactment of the mandatory seat belt law, the 60 and older age group had the lowest rate of use of all age groups. Since December 1984, however, the 263.7% increase in restraint use among those age 60 years and older has been greater than all other age groups: 0-3, 10.2%; 4-15, 42.7%; 16-29, 105.9%; and 30-59, 141.8%. The pattern of driver restraint use by age was similar to that of total occupants by age (Figure 3.5).

Restraint use continued to vary by occupant sex, with a greater proportion of females than males using restraints (49.6% vs. 38.7%; Table 3.3). The rate of increase in belt use among both females and males, however, has been similar since December 1984.

The pattern of restraint use by type of vehicle has been similar throughout the series of surveys (Figure 3.6). Occupants of small cars and mid-sized cars had the highest rates of restraint use in the current wave (48.5% and 48.0%, respectively; Table 3.3). Use rates for occupants of other types of vehicles were: large cars, 39.9%; vans, 39.0%; pickup trucks, 30.7%; and other vehicles, 43.8%. While occupants of pickup trucks were the least likely to use restraints, the rate of increase in restraint use among this group since December 1984 has been greater than any other group (195.2% for pickup truck occupants, 77.0% for small car occupants, 100.8% for mid-sized car occupants, 146.3% for large car occupants, 102.1% for van occupants, and 154.7% for occupants of other vehicles).

Consistent with previous survey waves, occupants in vehicles observed at freeway exits had a higher rate of restraint use than those observed at local intersections (47.1% vs. 42.7% in the current wave; Table 3.3). However, the rate of increase in restraint use at freeway exits since December 1984 has been less than that at local intersections (102.1 vs. 127.1%).

In the current survey, restraint use was slightly higher under snowy and rainy conditions than at other times (Table 3.3). However, comparisons with previous waves showed no consistent pattern of restraint use by weather conditions.

Figure 3.5: Driver Restraint Use by Age

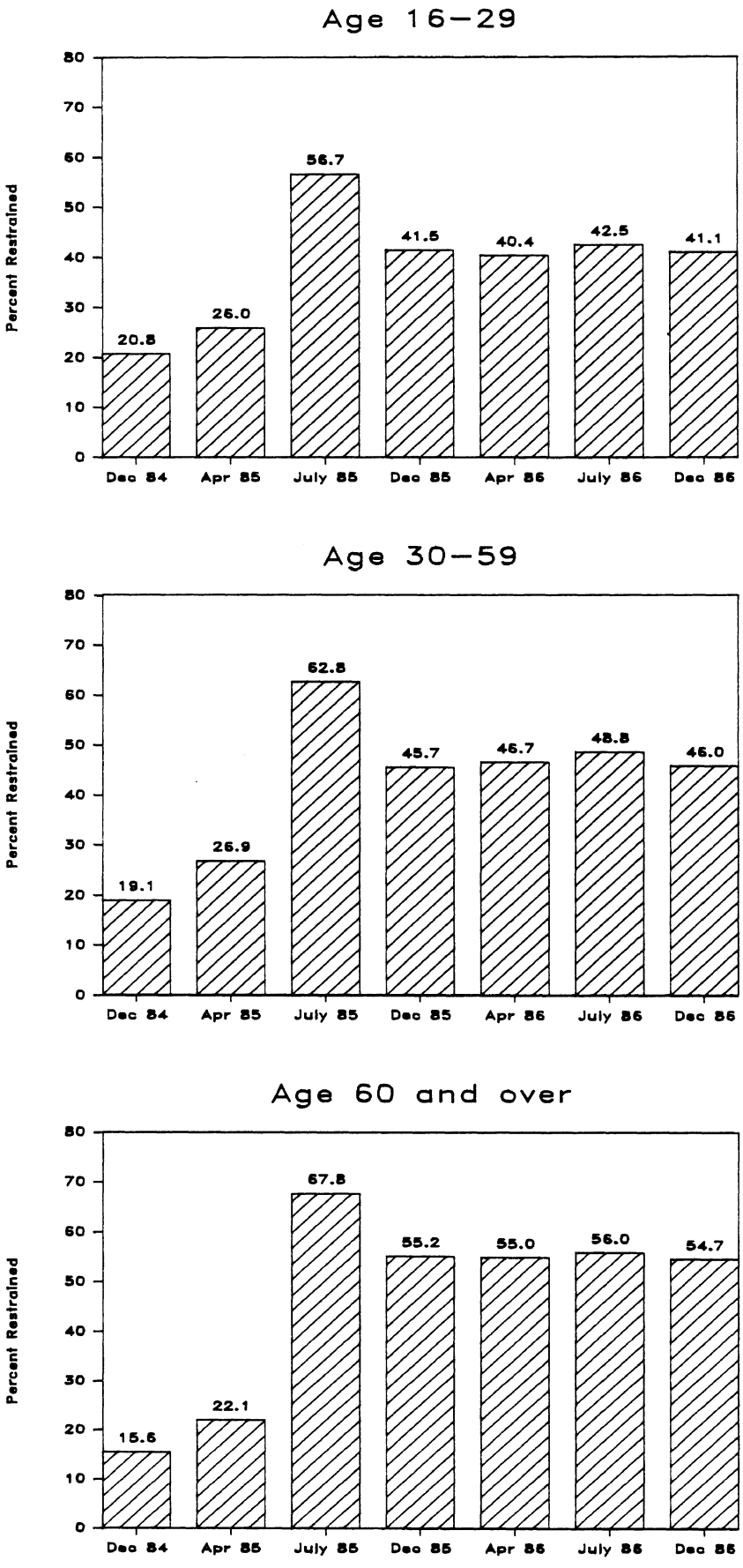
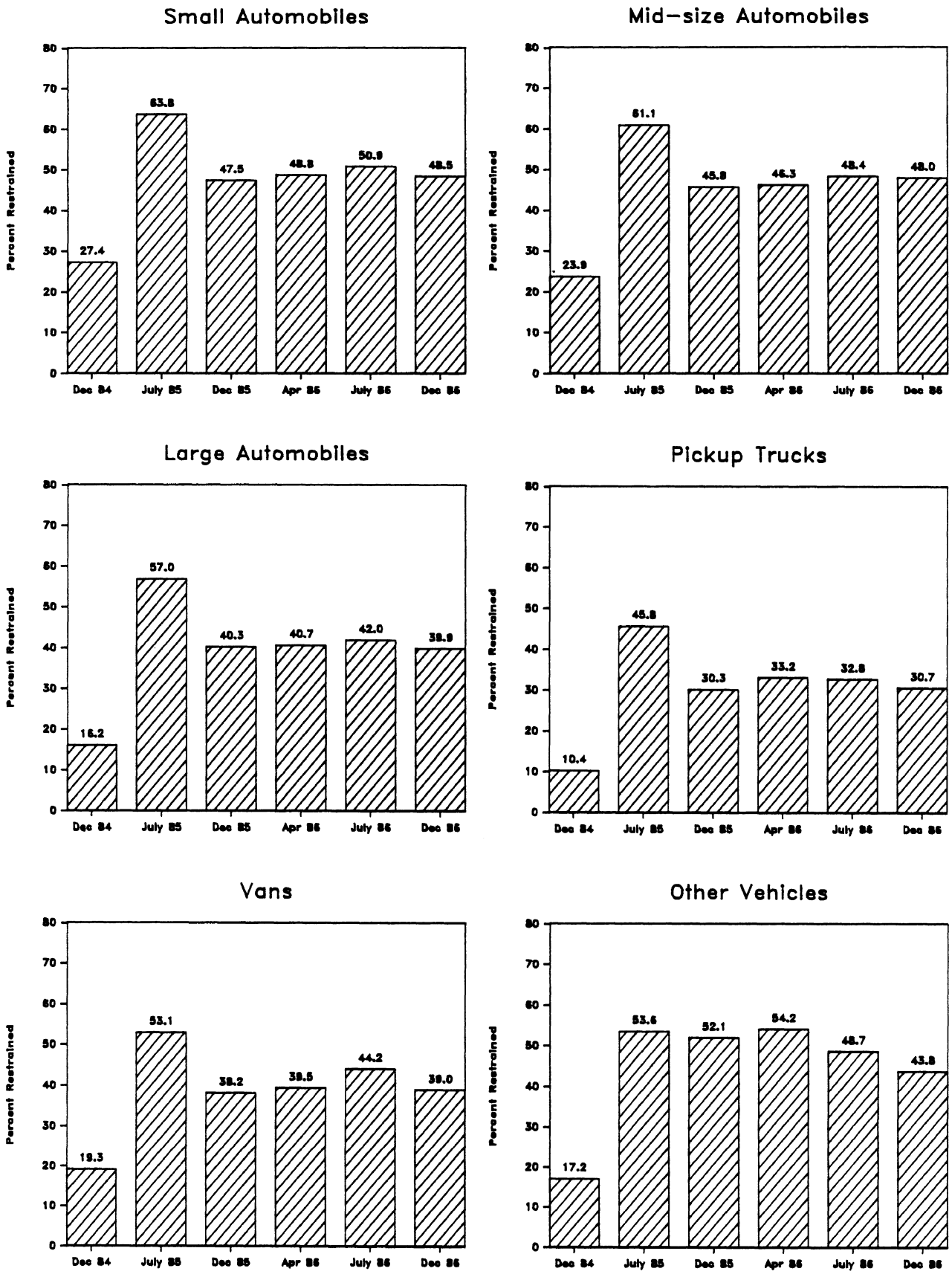


TABLE 3.3
Percent Restraint Use by Sex, Type of Vehicle, Observation Site, and Weather Conditions[1]

	Seat Position							
	Driver	Front Center	Front Right	Rear Left	Rear Center	Rear Right	Extra Seats[2]	All[3]
Sex								
Male	39.8	28.5	36.0	33.7	39.6	29.8	0.0	38.7
Female	54.0	22.2	47.1	41.9	35.6	22.6	0.0	49.6
Type of Vehicle								
Small Car	50.5	24.4	46.3	46.9	35.7	32.8	–	48.5
Mid-Sized Car	50.3	25.1	46.7	39.7	42.3	25.5	–	48.0
Large Car	41.5	28.4	41.4	26.4	33.6	17.4	0.0	39.9
Pickup Truck[4]	32.0	19.0	29.7	–	0.0	0.0	–	30.7
Van	39.3	39.1	42.8	35.4	45.5	30.3	4.4	39.0
Other	43.6	42.6	48.1	9.0	54.3	37.1	19.3	43.8
Observation Site								
Intersection	44.2	24.4	42.7	37.6	37.6	26.5	14.2	42.7
Freeway Exit	49.6	26.5	46.2	37.2	38.7	24.8	0.0	47.1
Weather Conditions								
Mostly Sunny	40.7	31.4	37.4	33.3	35.6	32.8	0.0	39.1
Mostly Cloudy	44.8	20.8	41.3	38.1	37.4	23.0	9.7	42.6
Raining	46.9	0.0	44.1	48.8	0.0	28.2	0.0	45.1
Snow	50.9	30.6	54.3	37.4	44.3	26.8	0.0	49.9
TOTAL	45.4	24.9	43.4	37.5	37.8	26.1	7.0	43.6

[1]All percents are based on analyses weighted according to the sample design to accurately represent the entire state. Restraint use includes correct and incorrect use of child restraint devices.
[2]Based on only 20 observed occupants.
[3]Restraint use for all positions includes cargo areas, passengers held in laps, and passengers standing.
[4]Data on rear seat passengers includes 4 occupants, riding in crew cab.

Figure 3.6: Restraint Use by Vehicle Type



As in previous survey waves, there was no consistent pattern of restraint use across time of day and day of week (Table 3.4).

Restraint use continued to vary by region of the state (Table 3.5 and Figure 3.7). Use rates were highest in the Southeast region (50.1%) and lowest in the Eastern upper peninsula (33.9%). The Southeast region has consistently had high rates of use throughout the series of surveys. The Eastern upper peninsula has had the lowest restraint use in every wave except April 1986. All regions experienced decreases in restraint use between July and December 1986 except the East Central region which increased slightly.

There was also variability in restraint use by sampling area (Table 3.6). The lowest rates of restraint use were seen in the City of Detroit (29.1%), Chippewa County (32.2%), Kent County, City of Grand Rapids (32.9%), Wayne County, City of Melvindale (33.5%), and Muskegon County (33.8%). Sampling areas with the highest restraint use rates in the current survey included Grand Traverse County (65.1%), Wayne County, City of Livonia (62.7%), Washtenaw County, City of Ann Arbor (62.6%), and Iosco-Alcona Counties (58.5%). The pattern of change in restraint use from previous survey waves was not consistent across sampling areas. Twenty-seven sampling areas exhibited decreases in restraint use, sixteen exhibited increases, and one remained the same. Most of these changes are presumably due to sampling error and are not of interest.

Although restraint use in all sampling areas has increased since December 1984 (before enactment of mandatory seat belt legislation), the magnitude of the increases has varied. The largest percentage increases were experienced in Delta County (249.0%), Wayne County, City of Melvindale (241.8%), and Mecosta-Newago Counties (241.6%). One reason for these large percentage increases is the low prelegislation rates of belt use in these areas.

Occupants riding in nonstandard positions were tallied separately (Table 3.7). Nonstandard positions included: lying, standing, sitting, or kneeling on the floor, seat, or cargo area; sharing seat belts; or riding on the lap of another occupant. Occupants in nonstandard seating positions were typically under 16 years of age, as might be expected. A total of 12.8% of occupants 0-3 years and 8.0% of occupants 4-15 years were observed in nonstandard seating positions. Within the 0-3 age group, the most common nonstandard seating position was sitting on the lap of another occupant. Within the 4-15 age group, the most common positions were sitting on the edge of the rear seat and in the cargo area.

The percentage of belted occupants observed to be using their seat belts incorrectly has changed little during the last three survey waves (Figure 3.8; incorrect use of child

TABLE 3.4
Percent Restraint Use by Time of Day and Day of Week[1]

	Seat Position							
	Driver	Front Center	Front Right	Rear Left	Rear Center	Rear Right	Extra Seats[2]	All[3]
Time of Day								
7-9 AM	50.7	50.0	50.8	49.1	44.8	30.8	–	50.1
9-10 AM	46.9	20.7	49.1	59.2	26.5	36.2	–	46.7
10-11 AM	45.6	23.4	47.4	38.4	50.3	28.0	41.7	45.0
11-12 AM	46.3	15.9	43.2	42.7	37.1	40.2	–	44.7
12-1 PM	43.6	18.2	44.3	25.9	25.5	18.1	0.0	41.5
1-2 PM	44.7	25.9	40.2	37.6	50.7	16.5	35.7	41.9
2-3 PM	45.1	31.4	43.7	41.1	44.7	30.3	–	43.9
3-4 PM	42.8	34.2	36.8	17.5	30.3	11.6	0.0	39.1
4-5 PM	43.9	17.2	40.3	37.5	28.2	28.8	0.0	41.6
5-6 PM	39.0	0.0	30.8	50.4	0.0	0.0	–	34.9
Day of Week								
Monday	49.8	8.1	51.1	49.2	45.0	42.9	–	49.5
Tuesday	46.5	10.8	41.9	43.1	46.4	21.2	0.0	44.6
Wednesday	45.5	30.9	43.6	20.1	30.5	14.6	0.0	43.1
Thursday	45.1	27.8	37.0	42.1	45.1	33.6	41.7	42.9
Friday	43.7	32.5	40.0	42.8	30.9	28.3	0.0	42.0
Saturday	42.5	16.5	42.6	30.0	33.3	22.5	100.0[4]	40.6
Sunday	44.6	31.9	47.1	35.7	40.8	25.0	0.0	43.4
TOTAL	45.4	24.9	43.4	37.5	37.8	26.1	7.0	43.6

[1]All percents are based on analyses weighted according to the sample design to accurately represent the entire state. Restraint use includes correct and incorrect use of child restraint devices.
[2]Based on only 20 observed occupants.
[3]Restraint use for all positions includes cargo areas, passengers held in laps, and passengers standing.
[4]Based on only one occupant.

TABLE 3.5
Percent Restraint Use by Michigan Department of Transportation Regions[1]

MDOT Region	Seat Position							
	Driver	Front Center	Front Right	Rear Left	Rear Center	Rear Right	Extra Seats[2]	All[3]
1. Western U.P.	49.8	45.7	45.3	50.3	53.6	30.1	100.0[4]	48.5
2. Eastern U.P.	35.7	12.6	31.5	43.7	16.1	33.5	–	33.9
3. Northwest	47.1	28.6	50.3	53.8	25.0	50.0	–	47.2
4. Northeast	48.8	12.5	50.6	70.0	50.0	60.0	100.0[5]	49.0
5. West Central	42.1	30.0	39.5	25.7	25.3	17.3	–	40.0
6. East Central	48.5	38.8	45.9	45.3	42.0	36.1	0.0	46.6
7. Southwest	48.1	6.7	46.1	20.4	8.8	13.2	–	45.7
8. Southeast	52.2	14.6	48.8	31.9	25.4	39.4	–	50.1
Metro Detroit	42.7	16.4	41.4	37.6	42.2	20.8	0.0	41.2
TOTAL	45.4	24.9	43.4	37.5	37.8	26.1	7.0	43.6

[1]All percents are based on analyses weighted according to the sample design to accurately represent the entire state. Restraint use includes correct and incorrect use of child restraint devices.
[2]Based on only 20 observed occupants.
[3]Restraint use for all positions includes cargo areas, passengers held in laps and passengers standing.
[4]Based on only two occupants.
[5]Based on only one occupant.

Figure 3.7: Restraint Use by Region

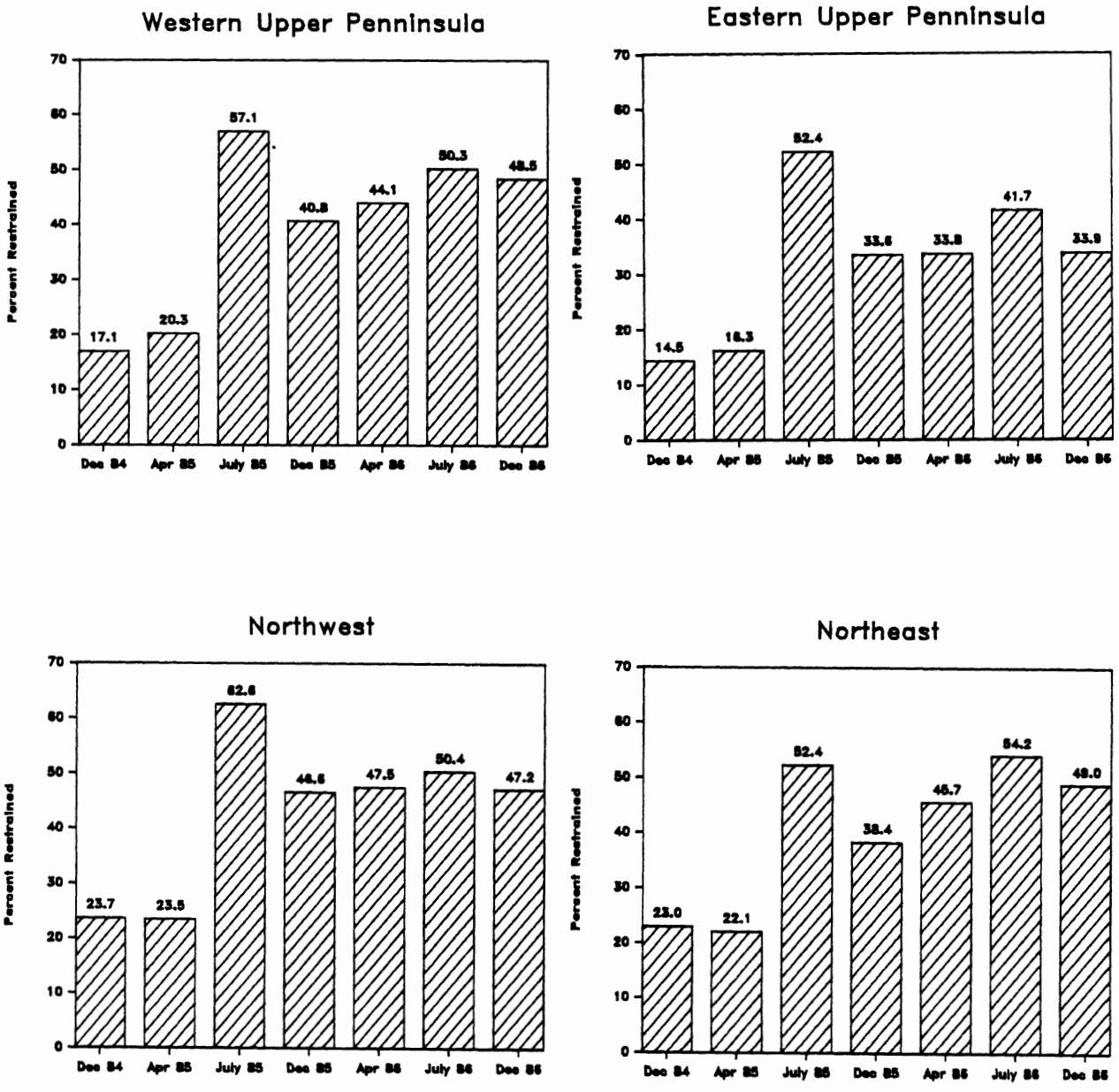


Figure 3.7 (Continued): Restraint Use by Region

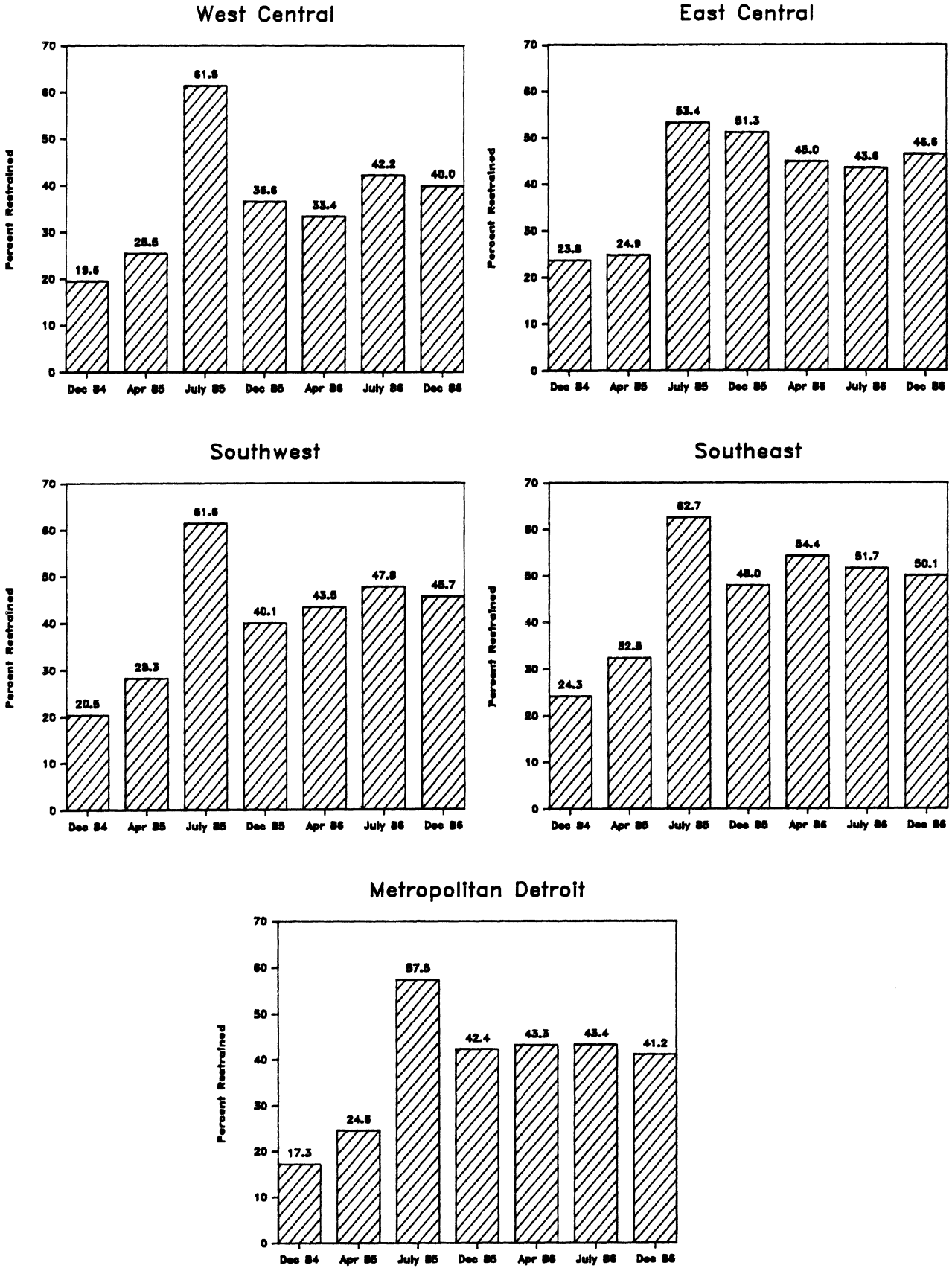


TABLE 3.6
Restraint Use, Number of Vehicles Observed, and Number of Occupants Observed for Each Sampling Area[1]

Sampling Area	Number of Vehicles Observed	Number of Occupants Observed	Percent Drivers Restrained	Percent Front Seat Passengers Restrained[2]	Percent All Occupants Restrained[2]
Barry[3]	204	260	48.5	53.2	48.5
Bay	201	405	56.7	59.5	54.7
Berrien County	204	275	40.2	28.3	36.4
Berrien, Niles	204	257	48.0	51.1	48.2
Charlevoix	204	277	37.7	38.6	38.9
Chippewa	207	299	34.4	27.3	32.2
Crawford-Roscommon	204	288	38.2	34.7	36.7
Delta	203	295	37.0	31.0	35.6
Dickinson	200	269	45.8	40.8	44.5
Eaton	204	258	55.4	44.4	52.3
Genesee	612	872	45.6	37.7	43.9
Grand Traverse	204	258	63.7	71.4	65.1
Ingham County	204	259	53.9	47.7	51.4
Ingham, East Lansing	204	244	54.4	46.7	54.5
Iosco-Alcona	204	369	59.3	55.6	58.5
Jackson	204	323	44.1	40.2	40.2
Kalamazoo County	204	258	44.6	51.3	43.8
Kalamazoo City	204	268	50.0	52.2	47.4
Kent County	204	259	49.5	35.6	45.6
Kent, Grand Rapids	204	258	36.3	20.5	32.9
Kent, Wyoming	207	275	48.2	38.9	44.3
Lapeer	204	272	44.6	37.7	43.8
Lenawee[3]	204	266	47.1	47.9	46.2
Macomb	606	775	47.3	49.3	47.5
Marquette	407	564	51.8	47.5	50.4
Mason	204	301	39.7	45.2	39.5
Mecosta-Newaygo	204	288	40.7	46.4	42.7
Monroe[3]	204	283	48.5	46.8	47.0
Montcalm[3]	207	327	38.0	42.5	37.7
Muskegon	204	311	36.3	34.9	33.8
Oakland County	1,019	1,472	51.5	54.6	50.5
Oakland, Royal Oak	204	255	51.5	47.5	50.8
Ottawa	204	332	45.6	44.6	43.1
Saginaw	405	620	51.3	45.3	47.0
St. Clair	204	307	37.7	32.1	36.5
VanBuren	174	241	49.7	35.9	43.6
Washtenaw, Ann Arbor	204	265	64.2	64.3	62.6
Wayne, Detroit	1,512	2,208	31.8	27.1	29.1
Wayne, Canton	204	277	48.5	50.0	49.1
Wayne, Garden City	204	293	45.6	50.0	46.1
Wayne, Livonia	204	252	59.8	75.0	62.7
Wayne, Melvindale etc.	203	341	33.6	37.6	33.5
Wayne, Trenton etc.	204	269	43.1	46.7	44.0
Wayne, Wyandotte	204	316	40.7	25.0	35.4
TOTAL	12,283	17,361	45.4	42.6	43.6

[1]All percentages are based on weighted analyses.
[2]Includes correct and incorrect use of child restraint devices.
[3]For these sampling areas no signalized freeway exits existed. Therefore, freeway exits required by the sample design were selected from an adjacent county.

TABLE 3.7
Number of Occupants in Nonstandard Seat Positions by Age[1]

Position	Age of Occupant		
	0–3	4–15	16+
Lying			
Front seat	1	0	0
Rear seat	2	0	0
Cargo Area	0	1	0
Standing			
Front seat	7	2	0
Front floor	3	1	0
Rear seat	6	2	0
Rear floor	0	5	0
Cargo area	3	4	0
Between bucket seats	2	1	0
Kneeling			
Front seat	1	6	0
Rear seat	2	6	0
Cargo Area	0	2	0
Sitting			
On edge of front seat	1	2	0
On edge of rear seat	0	26	2
Between bucket seats	1	0	0
On lap	39	3	0
On Rear floor	0	2	0
Cargo area	0	12	3[2]
Shared seat belt	2	0	0
Total occupants in nonstandard positions	70	75	5
Total occupants in all positions	548	936	14,051

[1] Data are not weighted.
[2] Includes one case of passenger riding unrestrained in a wheelchair that was anchored to the floor of a van.

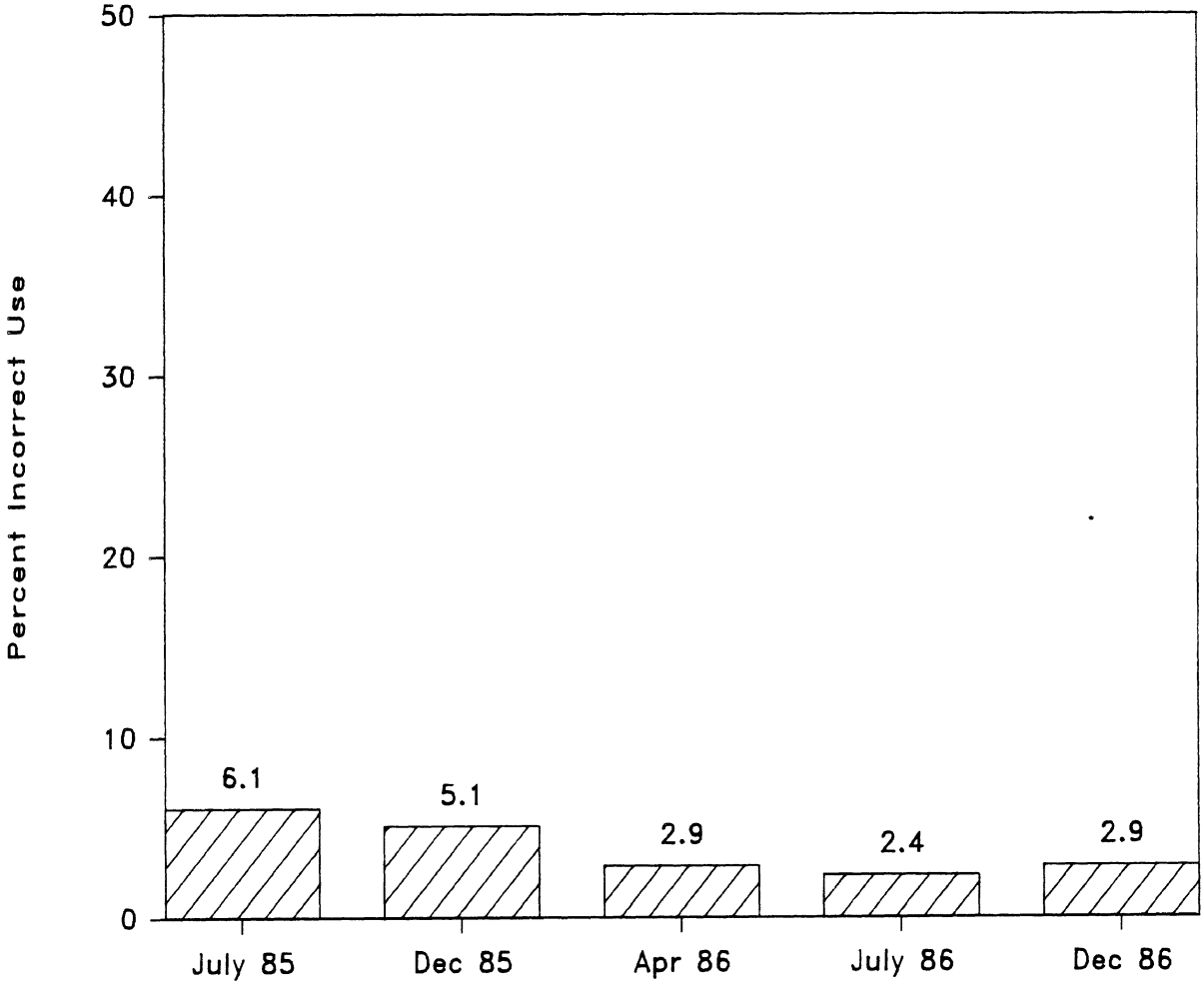
restraint devices is **not** included here. The percentage of belted occupants with incorrect use was 2.9% in the current wave, 2.4% in July 1986, and 2.9% in April 1986. By comparison, incorrect use of belts was 5.1% in December 1985 and 6.1% in July 1985. One possible explanation for the apparent decline in incorrect belt use since July 1985 is that occupants who immediately after the law took effect used their belts incorrectly are no longer using them at all.

In reporting findings from the previous survey wave, it was noted that a number of occupants observed during the July 1985 survey wave employed methods to **appear** restrained, when they were not. The relative absence of such attempts at deception since July 1985 may be due to a perception by the public that strict enforcement of the mandatory seat belt law is not occurring. Such a perception may also explain the decline in restraint use from the peak restraint use rate observed immediately following implementation of the law. Findings from other studies on the effects of mandatory seat belt legislation support the conclusion that public perception of enforcement of compulsory use laws and actual enforcement efforts affect restraint use. In Elmira, New York, for example, seat belt use increased substantially following a seat belt use law enforcement and publicity campaign conducted in late 1985; use declined in a comparison city during the same period (Williams and others, 1986). In Texas, strong enforcement efforts have been associated with high levels of seat belt use 1 year after implementation of seat belt legislation. Approximately 7,000 tickets per month are issued by state highway patrol officers to motorists in Texas who fail to obey the law (Insurance Institute for Highway Safety, 1986). In Michigan, a total of 27,068 tickets were issued by state police in the first ten months of 1986. However, the Texas law permits primary enforcement, in contrast to the Michigan law, which is limited to secondary enforcement.

Finally, in Illinois, restraint use declined from 50% observed in August 1985, immediately after enforcement of the mandatory seat belt law began, to 30% one year later. Mortimer (1986) attributes the low use rates to lack of enforcement of the law and the nature of the law, which permits only secondary enforcement.

Adherence to Michigan's seat belt law would be facilitated if it permitted primary enforcement. Even without such new legislation, however, stricter enforcement of the current law is needed, coupled with major publicity campaigns, in order to strengthen public perception about enforcement of the law and to ensure the law's continued success.

Figure 3.8: Percent of Belted Occupants with Incorrect Use



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APPENDIX A

MICHIGAN DEPARTMENT OF TRANSPORTATION REGION MAP

DISTRICT and COUNTY NUMBERS

APPENDIX B

SEAT BELT SURVEY CODEBOOK

Variable Number	Variable Name	Field Width	Character Type	Mult Resp	Page Number
1	SITE NUMBER	3	Numeric		44
2	SITE TYPE	1	Numeric		44
3	SITE CHOICE	1	Numeric		44
4	MONTH	2	Numeric		44
5	DAY OF MONTH	2	Numeric		44
6	START HOUR	2	Numeric		45
7	START MINUTE	2	Numeric		45
8	DAY OF WEEK	1	Numeric		45
9	WEATHER	1	Numeric		45
10	BREAK TIME (MINUTES)	2	Numeric		46
11	END HOUR	2	Numeric		46
12	END MINUTE	2	Numeric		46
13	SAMPLE REGION	1	Numeric		46
14	PSU ID	2	Numeric		46
15	MDOT REGION	1	Numeric		47
16	REGION WEIGHT	5	Numeric		48
17	ELAPSED TIME	2	Numeric		48
18	SITE OBSERVER	1	Numeric		48
19	SAMPLE ERROR COMP UNIT #	2	Numeric		48

Variable Number	Variable Name	Field Width	Character Type	Mult Resp	Page Number
20	VEHICLE OBSERVER	1	Numeric		50
21	VEHICLE TYPE	1	Numeric		50
22	SEQUENCE NUMBER	2	Numeric		50
23	SITE # COUNT	2	Numeric		50
24	OBSERVER COUNT	2	Numeric		51
25	SITE/OBSERVER SEQ #	2	Numeric		51
26	HOUR OF OBSERVATION	2	Numeric		51
27	MINUTE OF OBSERVATION	2	Numeric		51
28	SITE WEIGHT	6	Numeric		52
29	TOTAL WEIGHT	6	Numeric		52
30	WAVE	2	Numeric		52
31	DRIVER BELTED (Y/N)	1	Numeric		52
32	DRIVER RESTRAINT USE	1	Numeric		52
33	DRIVER SEX	1	Numeric		52
34	DRIVER AGE	1	Numeric		53

Variable Number	Variable Name	Field Width	Character Type	Mult Resp	Page Number
35	POSITION	2	Numeric		54
36	BELTED (Y/N)	1	Numeric		54
37	RESTRAINT USE	1	Numeric		54
38	SEX	1	Numeric		55
39	AGE	1	Numeric		55
40	SPECIAL TAG	2	Numeric		55
41	OCCUPANT # IN POSITION	1	Numeric		55

MICHIGAN SEAT BELT SURVEY
Wave 7, December 1986

Site Variables

Variables 1 through 19 describe site level information. The frequencies for the site variables contain one record for each of the 240 sites.

Variable 1 **SITE NUMBER** MD1: None MD2: None Field Width: 3 Type: Numeric

Variable 2 **SITE TYPE** MD1: None MD2: None Field Width: 1 Type: Numeric

FREQ	Prcnt	SITE TYPE
192	80.0	1. Intersection
48	20.0	2. Freeway Exit

Variable 3 **SITE CHOICE** MD1: None MD2: None Field Width: 1 Type: Numeric

FREQ	Prcnt	SITE CHOICE
240	100.0	1. Primary
0	0.0	2. Secondary

Variable 4 **MONTH** MD1: None MD2: None Field Width: 2 Type: Numeric

FREQ	Prcnt	MONTH
240	100.0	12. December

Variable 5 **DAY OF MONTH** MD1: None MD2: None Field Width: 2 Type: Numeric

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Variable 6 **START HOUR** MD1: None Field Width: 2
MD2: None Type: Numeric

FREQ	Prcnt	START HOUR
1	0.4	07.
20	8.3	08.
26	10.8	09.
34	14.2	10.
33	13.7	11.
27	11.2	12.
29	12.1	13.
30	12.5	14.
21	8.7	15.
18	7.5	16.
1	0.4	17.

Variable 7 **START MINUTE** MD1: None Field Width: 2
MD2: None Type: Numeric

Variable 8 **DAY OF WEEK** MD1: None Field Width: 1
MD2: None Type: Numeric

FREQ	Prcnt	DAY OF WEEK
34	14.2	1. Monday
33	13.7	2. Tuesday
35	14.6	3. Wednesday
36	15.0	4. Thursday
43	17.9	5. Friday
32	13.3	6. Saturday
27	11.2	7. Sunday

Variable 9 **WEATHER** MD1: None Field Width: 1
MD2: None Type: Numeric

FREQ	Prcnt	WEATHER
42	17.5	1. Mostly Sunny
126	52.5	2. Mostly Cloudy
18	7.5	3. Rain
54	22.5	4. Snow

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Variable 10 **BREAK TIME (MINUTES)** MD1: None Field Width: 2
MD2: None Type: Numeric

Variable 11 **END HOUR** MD1: None Field Width: 2
MD2: None Type: Numeric

FREQ	Prcnt	END HOUR
14	5.8	08.
23	9.6	09.
33	13.7	10.
31	12.9	11.
31	12.9	12.
23	9.6	13.
36	15.0	14.
25	10.4	15.
21	8.7	16.
3	1.2	17.

Variable 12 **END MINUTE** MD1: None Field Width: 2
MD2: None Type: Numeric

Variable 13 **SAMPLE REGION** MD1: None Field Width: 1
MD2: None Type: Numeric

FREQ	Prcnt	SAMPLE REGION
20	8.3	1. Upper
20	8.3	2. Northern
20	8.3	3. Western
20	8.3	4. Central
20	8.3	5. South Central
20	8.3	6. Eastern
120	50.0	7. South Eastern

Variable 14 **PSU ID** MD1: None Field Width: 2
MD2: None Type: Numeric

FREQ	Prcnt	PSU ID
4	1.7	08. BARRY
4	1.7	09. BAY
4	1.7	11. BERRIEN COUNTY
4	1.7	12. BERRIEN, NILES
4	1.7	15. CHARLEVOIX

FREQ	Prcnt	Var 14 PSU ID
4	1.7	17. CHIPPEWA
4	1.7	20. CRAWFORD-ROSCOMMON
4	1.7	21. DELTA
4	1.7	22. DICKINSON
4	1.7	23. EATON
12	5.0	25. GENESEE
4	1.7	28. GRAND TRAVERSE
4	1.7	33. INGHAM COUNTY
4	1.7	34. INGHAM, EAST LANSING
4	1.7	35. IOSOC-ALCONA
4	1.7	38. JACKSON
4	1.7	39. KALAMAZOO COUNTY
4	1.7	40. KALAMAZOO, CITY OF
4	1.7	41. KENT COUNTY
4	1.7	42. KENT, GRAND RAPIDS
4	1.7	43. KENT, WYOMING
4	1.7	44. LAPEER
4	1.7	46. LENAWEE
12	5.0	50. MACOMB
8	3.3	52. MARQUETTE
4	1.7	53. MASON
4	1.7	54. MECSOTA-NEWAYGO
4	1.7	58. MONROE
4	1.7	59. MONTCALM
4	1.7	61. MUSKEGON
20	8.3	63. OAKLAND COUNTY
4	1.7	64. OAKLAND, ROYAL OAK
4	1.7	70. OTTAWA
8	3.3	73. SAGINAW
4	1.7	74. ST. CLAIR
4	1.7	80. VANBUREN
4	1.7	81. WASHTENAW, ANN ARBOR
28	11.7	82. WAYNE, DETROIT
4	1.7	83. WAYNE, CANTON
4	1.7	84. WAYNE, GARDEN CITY
4	1.7	85. WAYNE, LIVONIA
4	1.7	86. WAYNE, MELVINDALE ETC.
4	1.7	87. WAYNE, TRENTON ETC.
4	1.7	88. WAYNE, WYANDOTTE

Variable 15 **MDOT REGION** MD1: None Field Width: 1
MD2: None Type: Numeric

FREQ	Prcnt	MDOT REGION
12	5.0	1. Western U.P.
8	3.3	2. Eastern U.P.
12	5.0	3. Northwest
8	3.3	4. Northeast

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FREQ	Prcnt	Var 15 MDOT REGION
28	11.7	5. West Central
28	11.7	6. East Central
28	11.7	7. Southwest
24	10.0	8. Southeast
92	38.3	9. Metro Detroit

Variable 16 **REGION WEIGHT** MD1: None Field Width: 5
MD2: None Type: Numeric
Implied Dec Places: 4

Variable 17 **ELAPSED TIME** MD1: None Field Width: 2
MD2: None Type: Numeric

Variable 18 **SITE OBSERVER** MD1: None Field Width: 1
MD2: None Type: Numeric

FREQ	Prcnt	PRIMARY OBSERVER FOR THIS SITE
76	31.7	2. Observer #2
64	26.7	3. Observer #3
77	32.1	4. Observer #4
23	9.6	5. Observer #5

Variable 19 **SAMPLE ERROR COMP UNIT #** MD1: None Field Width: 2
MD2: None Type: Numeric

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Vehicle variables

Variables 20 through 34 describe the vehicle and driver. The frequencies for the vehicle variables reflect one record for each vehicle observed.

Variable 20 **VEHICLE OBSERVER** MD1: None Field Width: 1
MD2: None Type: Numeric

FREQ	Prcnt	ACTUAL OBSERVER FOR THIS VEHICLE
3860	31.4	2. Observer #2
3254	26.5	3. Observer #3
3993	32.5	4. Observer #4
1176	9.6	5. Observer #5

Variable 21 **VEHICLE TYPE** MD1: 8 Field Width: 1
MD2: None Type: Numeric

FREQ	Prcnt	VEHICLE TYPE
3172	25.8	1. Small Car
3498	28.5	2. Midsize Car
3190	26.0	3. Large Car
1346	11.0	4. Pickup
652	5.3	5. Van
408	3.3	6. Other
17	0.1	8. Missing Data

Variable 22 **SEQUENCE NUMBER** MD1: None Field Width: 2
MD2: None Type: Numeric

Variable 23 **SITE # COUNT** MD1: None Field Width: 2
MD2: None Type: Numeric

FREQ	Prcnt	COUNT OF VEHICLES OBSERVED AT THIS SITE
21	0.2	21.
192	1.6	48.
49	0.4	49.
300	2.4	50.
10098	82.2	51.

1566	12.7	54.
57	0.5	57.

Variable 24 **OBSERVER COUNT** MD1: None Field Width: 2
MD2: None Type: Numeric

FREQ	Prcnt	NUMBER OF VEHICLES COUNTED BY THIS OBSERVER
21	0.2	21.
192	1.6	48.
49	0.4	49.
300	2.4	50.
10098	82.2	51.
1566	12.7	54.
57	0.5	57.

Variable 25 **SITE/OBSERVER SEQ #** MD1: None Field Width: 2
MD2: None Type: Numeric

Variable 26 **HOUR OF OBSERVATION** MD1: 88 Field Width: 2
MD2: None Type: Numeric

FREQ	Prcnt	HOUR OF THE DAY THIS VEHICLE WAS OBSERVED
26	0.2	07.
863	7.0	08.
1350	11.0	09.
1716	14.0	10.
1753	14.3	11.
1300	10.6	12.
1339	10.9	13.
1718	14.0	14.
1138	9.3	15.
1003	8.2	16.
77	0.6	17.

Variable 27 **MINUTE OF OBSERVATION** MD1: 88 Field Width: 2
MD2: None Type: Numeric

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Variable 28 **SITE WEIGHT** MD1: None Field Width: 6
MD2: None Type: Numeric
Implied Dec Places: 4

Variable 29 **TOTAL WEIGHT** MD1: None Field Width: 6
MD2: None Type: Numeric
Implied Dec Places: 4

Variable 30 **WAVE** MD1: None Field Width: 2
MD2: None Type: Numeric

FREQ	Prcnt	WAVE
12283	100.0	07. Wave 7

Variable 31 **DRIVER BELTED (Y/N)** MD1: 8 Field Width: 1
MD2: None Type: Numeric

FREQ	Prcnt	DRIVER BELTED (Y/N)
6720	54.7	1. Not Belted
5559	45.3	2. Belted
4	0.0	8. Missing data

Variable 32 **DRIVER RESTRAINT USE** MD1: 8 Field Width: 1
MD2: None Type: Numeric

FREQ	Prcnt	DRIVER RESTRAINT USE
6720	54.7	1. Not Belted
5559	45.3	2. Belted
4	0.0	8. Missing Data

Variable 33 **DRIVER SEX** MD1: 8 Field Width: 1
MD2: None Type: Numeric

FREQ	Prcnt	DRIVER SEX
7442	60.6	1. Male
4828	39.3	2. Female
13	0.1	8. Missing Data

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Variable 34 **DRIVER AGE** MD1: 8 Field Width: 1
MD2: None Type: Numeric

FREQ	Prcnt	DRIVER AGE
1	0.0	2. 4-15
4001	32.6	3. 16-29
6910	56.3	4. 30-59
1363	11.1	5. 60+
8	0.1	8. Missing Data

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Variables 35 through 37 describe the occupants. The frequencies for the occupant variables contain one record for each occupied occupant position.

Variable 35 **POSITION** MD1: 88 Field Width: 2
MD2: None Type: Numeric

FREQ	Prcnt	POSITION
12283	70.8	01. Front Left
193	1.1	02. Front Center
3634	20.9	03. Front Right
364	2.1	04. Rear Left
225	1.3	05. Rear Center
562	3.2	06. Rear Right
42	0.2	07. In Lap
25	0.1	08. Cargo Area
20	0.1	09. Extra Seat
13	0.1	10. Standing
0	0.0	88. Missing Data

Variable 36 **BELTED (Y/N)** MD1: 8 Field Width: 1
MD2: None Type: Numeric

FREQ	Prcnt	BELTED (Y/N)
9784	56.4	1. Not Belted
7560	43.5	2. Belted (any type)
17	0.1	8. Missing Data

Variable 37 **RESTRAINT USE** MD1: 8 Field Width: 1
MD2: None Type: Numeric

FREQ	Prcnt	RESTRAINT USE
9784	56.4	1. Not Belted
7340	42.3	2. Belted
167	1.0	3. CRD OK
53	0.3	4. CRD Wrong
17	0.1	8. Missing Data

Variable 38 **SEX** MD1: 8 Field Width: 1
MD2: None Type: Numeric

FREQ	Prcnt	SEX
9357	53.9	1. Male
7936	45.7	2. Female
68	0.4	8. Missing Data

Variable 39 **AGE** MD1: 8 Field Width: 1
MD2: None Type: Numeric

FREQ	Prcnt	AGE
548	3.2	1. 0-3
936	5.4	2. 4-15
5301	30.5	3. 16-29
8550	49.2	4. 30-59
2010	11.6	5. 60+
16	0.1	8. Missing Data

Variable 40 **SPECIAL TAG** MD1: None Field Width: 2
MD2: None Type: Numeric

FREQ	Prcnt	SPECIAL TAG
17137	98.7	00. None
222	1.3	01. Shoulder Belt Misused
2	0.0	02. Lap Belt Misused

Variable 41 **OCCUPANT # IN POSITION** MD1: 8 Field Width: 1
MD2: None Type: Numeric

Sequence number for occupants in same seat position.

FREQ	Prcnt	OCCUPANT # IN POSITION
17329	99.8	1. First Occupant
22	0.1	2. Second Occupant