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DIRECT OBSERVATION OF SEAT BELT USE IN MICHIGAN: DECEMBER 1985

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ABSTRACT

Results of a direct-observation study of seat belt use in Michigan, conducted in December, 1985, were compared with results of previous surveys in December, 1984; April, 1985; and July, 1985. The current survey observed a probability sample of 17,500 occupants in 12,106 cars and light trucks between December 2 and December 21. Use of restraint systems among motorists of all ages decreased substantially between July and December, the first five months a mandatory seat belt law was in effect. Overall restraint use for occupants of all ages decreased from 58.4% in July to 43.0% in December, 1985. Restraint use decreased from 70% to 59.1% among 0-3-year-olds, from 48.9% to 38.7% among 4-15-year-olds, from 53.2% to 36.4% among 16-29-year-olds, from 61.8% to 44.2% among 30-59-year-olds, and from 65.9% to 54.0% among occupants over age 60. Lower rates of belt use were observed in December for both males and females, among occupants in all seating positions, and in all regions of the state. Despite the recent decrease, however, belt use remains higher than it was before the mandatory use law took effect (43.0% in December, 1985, versus 19.8% in December, 1984). Additional survey waves are scheduled for April, July, and December, 1986.

17. Key Words	18. Distribution Statement
Motor vehicle occupant restraint use, safety belt use, child seat use, seat belt survey, direct observational survey	Unlimited

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Chapter 1

INTRODUCTION

In December, 1984, The University of Michigan Transportation Research Institute began a series of direct-observation surveys of seat belt use among motor vehicle occupants throughout the State of Michigan. Two survey waves (December, 1984, and April, 1985) were conducted prior to Michigan's mandatory seat belt law, which took effect July 1, 1985. A third wave was conducted in July, 1985, immediately following implementation of the law. The survey reported here was conducted from December 2 to December 21, 1985. All surveys examined differential restraint use by 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 previous reports for complete results from December, April, and July. Data collected in the two pre-law waves provide a baseline against which the effects of the law are assessed. The current report compares restraint use five months after the law took effect with the previous results. Additional survey waves are scheduled for April, July, and December, 1986, as part of a continuing evaluation of the effects of the mandatory belt use law.

Chapter 2

METHODS

Trained personnel observed motor vehicles at a carefully selected probability sample of 240 intersections throughout the State of Michigan. Observers recorded restraint use, seat position, estimated age, and sex for occupants in **all** seating positions in each sampled vehicle. In addition, the size and type of vehicle was 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 on 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.

In addition to the items recorded in previous waves, observers in July and December, 1985, were instructed to record misuse of seat belts. Examples of belt misuse included: positioning the shoulder harness under the outboard arm, behind the back, or over the inside shoulder; and restraining two occupants (one on another's lap) with one seat belt. The misuse category does not include occupants (typically in the 4-15 age group) who are too short to wear the shoulder harness in the correct position across the chest. Often such occupants place the belt under the arm or behind the back. These occupants were coded as correctly belted. Occupants misusing seat belts were coded as "belted" and, therefore, appear in the tables and figures below as restrained. However, misuse of belts was recorded to assess the extent of belt misuse and to permit further analyses of motorists who incorrectly use seat belts.

Observers also noted in the comments section when an observed vehicle was state-, city-, county-, or federally-owned or whether it was a law enforcement vehicle. These special vehicles were tallied in two groups: state vehicles and other government vehicles. These data allowed for comparison of belt use among the general public with use among government employees, many of who have been required by department policy to use seat belts since 1978.

Observers limited the number of vehicles recorded during any given signal cycle to three. This procedure was adopted during the July wave. After the mandatory use law took effect, motorists 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 motorists in the

survey.

The identical sample of 240 sites was used in each study. Every site selected into the probability sample was observed. No sites were missed, despite occasionally severe winter storms during the data collection period. Three full-time observers were hired. One worked on all previous waves, the second was an observer for the July wave, and the third was newly hired for December, 1985. A low turnover rate among observers provides consistency while increasing reliability across waves. In each wave, new observers participate in an intensive training program (outlined in the first report of this series). Observers who have worked on previous waves review data collection procedures prior to beginning field work.

The first observer visited 90 sites; the second, 40; and the third, 97. The remaining 13 sites were observed by the field supervisor. As in the April and July survey waves, two-person teams were used to observe at certain central city sites. At these sites 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.

The distribution of site observations by day of week and hour of day were similar to previous survey waves. Descriptive statistics for the 240 observation sites are shown in Table 2.1.

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, cargo areas, or in laps, need to be interpreted with care.

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 0.6% of all occupants observed. These are cases in which the observer could not accurately identify whether the occupant was restrained. Belt use was not recorded for only 0.1% of the 12,106 drivers observed, and 0.2% of the 3,744 front-right occupants observed. Restraint use could not be determined for 25% of 24 occupants of third and fourth seats of station wagons or vans. Front-center and rear-seat occupants had moderate levels of missing data on restraint use (2.4% to 6.1%; see Table 2.2). Missing data rates for all other variables were less than 1.0%.

To ensure comparability across survey waves, the same methods were used in each of the survey waves, except for the few minor differences noted here. Sample design, data collection methods, and analytic procedures are discussed in detail in the first report of this series (Wagenaar and Wiviott, 1985a).

TABLE 2.1
Descriptive Statistics for the 240 Observation Sites

Day of Week		Start Time		Site Choice		Weather		Observer	
Monday	13.8%	7–10 AM	20.4%	Primary	99.6%	Sunny	8.3%	(A)	37.5%
Tuesday	13.8%	10–12 AM	27.9%	Alternate	0.4%	Cloudy	51.7%	(B)	16.7%
Wednesday	13.8%	12–2 PM	20.8%			Rain	7.5%	(C)	5.4%
Thursday	16.7%	2–4 PM	23.8%			Snow	32.5%	(D)	40.4%
Friday	18.3%	4–5 PM	7.1%						
Saturday	12.5%								
Sunday	11.3%								
TOTALS	100%		100%		100%		100%		100%

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

	Seating Position									
	Driver	Front Center	Front Right	Rear Left	Rear Center	Rear Right	Extra Seats	Cargo Area	Held in Lap	All[1]
Restraint Use										
None	6,620	160	2,136	254	208	382	16	29	59	9,887
Belted	5,471	31	1,562	106	32	115	2	0	2	7,321
CRD Correct	–	11	29	31	31	46	0	0	0	148
CRD Wrong	–	4	9	10	6	8	0	0	0	37
Missing	15	5	8	25	18	29	6	0	1	107
% Missing	0.1	2.4	0.2	5.9	6.1	5.0	25.0	0.0	1.6	0.6
Sex										
Male	7,483	80	1,231	210	140	256	14	22	23	9,469
Female	4,606	124	2,499	207	146	312	10	7	27	7,951
Missing	17	7	14	9	9	12	0	0	12	80
% Missing	0.1	3.3	0.4	2.1	3.1	2.1	0.0	0.0	19.4	0.5
Age										
0–3	0	48	73	69	59	78	0	0	53	385
4–15	1	66	453	227	175	256	16	23	9	1,244
16–29	3,539	64	1,101	56	33	98	2	1	0	4,894
30–59	7,214	22	1,489	53	19	98	3	4	0	8,902
60+	1,332	9	617	17	7	48	3	1	0	2,034
Missing	20	2	11	4	2	2	0	0	0	41
% Missing	0.2	0.9	0.3	0.9	0.7	0.3	0.0	0.0	0.0	0.2
Vehicle Type										
Small Car	3,324	6	902	118	69	158	0	5	5	4,593
Midsize Car	3,447	34	1,076	123	95	174	0	3	13	4,974
Large Car	2,985	74	1,086	139	86	196	4	6	22	4,603
Pickup	1,360	92	378	3	1	2	0	2	14	1,852
Van	579	5	172	24	20	21	20	10	6	857
Other	385	0	108	12	15	16	0	3	0	540
Missing	26	0	22	7	9	13	0	0	2	81
% Missing	0.2	0.0	0.6	1.6	3.1	2.2	0.0	0.0	3.2	0.5
Site Type										
Intersection	9,596	180	3,035	361	237	488	21	23	58	14,018
Freeway Exit	2,510	31	709	65	58	92	3	6	4	3,482
Missing	0	0	0	0	0	0	0	0	0	0
Day of Week										
Monday	1,648	16	402	40	29	47	1	5	12	2,205
Tuesday	1,664	24	433	47	23	60	0	3	8	2,268
Wednesday	1,682	24	435	48	33	74	7	2	12	2,318
Thursday	2,028	21	538	41	30	70	0	2	8	2,739
Friday	2,241	28	639	62	43	84	0	6	7	3,112
Saturday	1,526	46	645	73	65	108	5	2	8	2,483
Sunday	1,317	52	652	115	72	137	11	9	7	2,375
Missing	0	0	0	0	0	0	0	0	0	0

TABLE 2.2 Continued

	Seating 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	951	13	208	24	19	32	0	0	1	1,248
9-10 AM	1,148	11	304	46	26	59	5	6	2	1,608
10-11 AM	1,647	27	470	59	34	75	10	2	6	2,334
11-12 AM	1,796	35	574	64	45	98	1	6	8	2,633
12-1 PM	1,233	24	408	41	35	62	0	1	5	1,812
1-2 PM	1,197	15	414	40	32	54	0	4	12	1,769
2-3 PM	1,560	36	536	56	35	71	5	5	8	2,314
3-4 PM	1,425	31	457	55	42	70	0	1	9	2,092
4-5 PM	1,131	19	367	41	27	59	3	4	11	1,666
5-6 PM	18	0	6	0	0	0	0	0	0	24
Missing	0	0	0	0	0	0	0	0	0	0
Weather										
Sunny	1,023	19	334	38	23	63	2	1	2	1,506
Cloudy	6,206	131	2,098	267	182	338	21	24	36	9,316
Rain	900	13	199	20	11	32	0	0	1	1,180
Snow	3,977	48	1,113	101	79	147	1	4	23	5,498
Missing	0	0	0	0	0	0	0	0	0	0
MDOT Region										
Western U.P.	610	23	222	21	12	33	0	1	2	924
Eastern U.P.	408	16	172	31	21	34	0	0	2	684
Northwest	612	13	199	22	15	24	1	0	3	889
Northeast	408	6	142	23	6	14	0	2	4	607
West Central	1,378	45	522	85	53	96	11	7	11	2,208
East Central	1,416	22	394	41	32	55	1	1	5	1,970
Southwest	1,393	33	439	33	33	46	1	5	7	1,994
Southeast	1,191	21	404	43	40	79	3	5	8	1,801
Metro Detroit	4,690	32	1,250	127	83	199	7	8	20	6,423
Missing	0	0	0	0	0	0	0	0	0	0
TOTAL N	12,106	211	3,744	426	295	580	24	29	62	17,500

[1] Includes 23 occupants standing.

Chapter 3

RESULTS

Forty-three percent (43.0%) of all the occupants observed during the December, 1985, wave were using seat belts or child restraint devices. Restraint use among occupants of all ages decreased significantly in the first five months the mandatory seat belt law was in effect. The current rate of restraint use represents a 26.4% decrease from the 58.4% use rate observed in July.

Although restraint use is lower than in July, more people are using restraints today than before the mandatory law was implemented. In April, 1985, restraint use was 25.8%, and in December, 1984 use was only 19.8%. In the last twelve months (from December, 1984, to December, 1985), restraint use in Michigan increased 117.2%. Figure 3.1 illustrates restraint use rates for each of the four survey waves.

Effects of the mandatory seat belt law can be clearly seen by examining restraint use among front-seat occupants 16 years of age and older. 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, 1985). When children under the age of 16 are excluded, the effect of the adult belt law is more clear (Table 3.1 and Figure 3.2). In December, 1984, restraint use for adults (16 and over) was 18.3% among front-seat occupants and 7.2% among occupants in the rear-seat. A noticeable increase was seen in the April wave, which was conducted after the law was enacted but before implementation. During the July wave, which was conducted immediately after implementation, restraint use among front-seat occupants more than doubled, increasing to 60.5%. In December, 1985, five months after the law took effect, the increase between April and July deteriorated by half. Restraint use among front-seat occupants was down to 44.0% in the current wave. Among rear-seat occupants, use was down to 6.9%, slightly lower than December, 1984.

Front-right passengers and drivers are the only two seat positions where the effects of the law can still be seen five months after implementation (Table 3.2 and Figure 3.3). Restraint use in every other position dropped back to the level observed in December, 1984.

Restraint use among occupants age 0-3 continues to be higher than any other age group, 59.1%, (Table 3.2 and Figure 3.4). In December, 1985, this age group returned to the levels of restraint use observed in the two pre-law surveys (60.2% in April, 1985, and 60.8% in December,

FIGURE 3.1

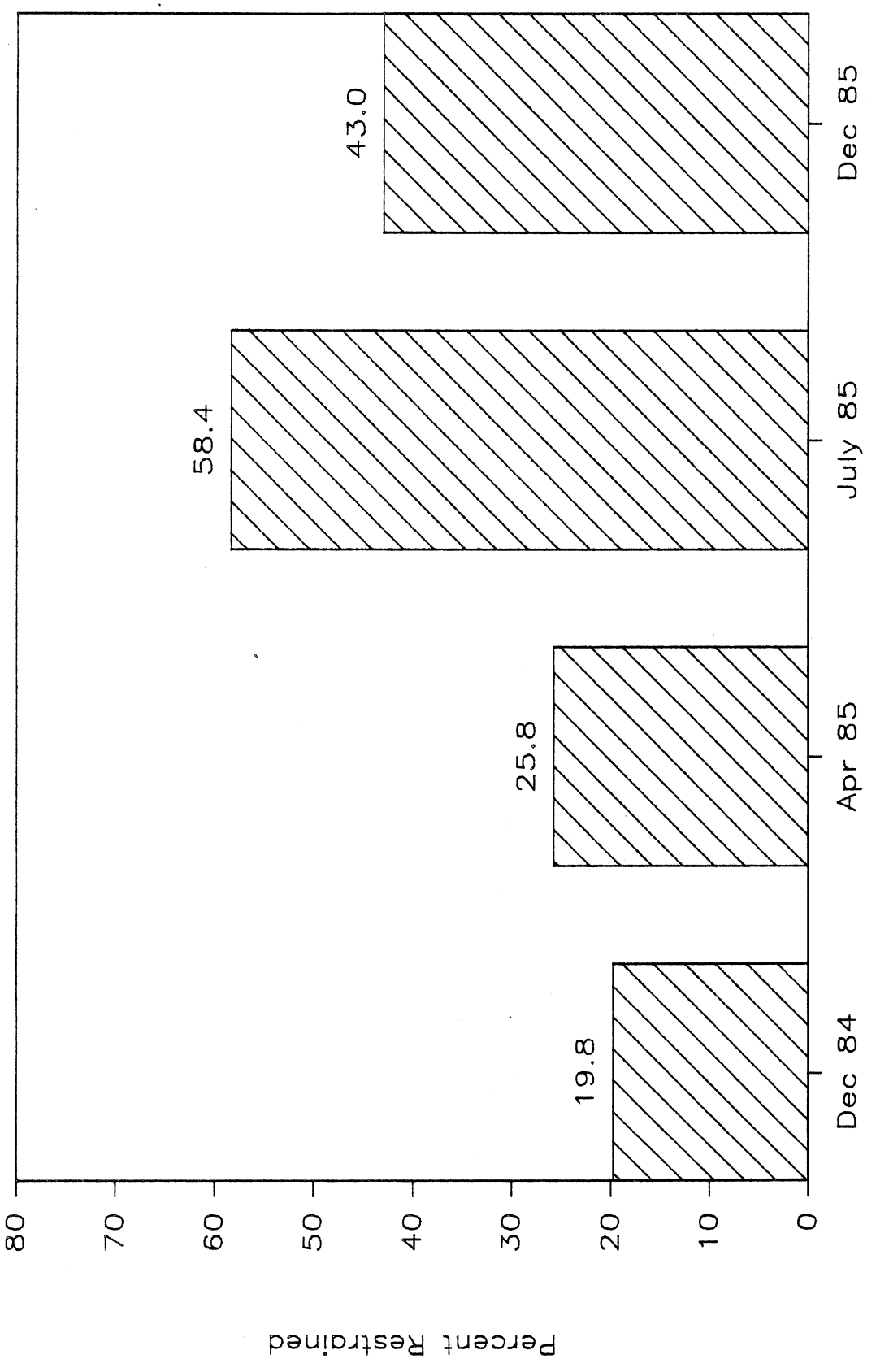

Overall Restraint Use
Percent Restrained
0
10
20
30
40
50
60
70
80
19.8
25.8
58.4
43.0
Dec 84
Apr 85
July 85
Dec 85

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

	Seating Location		
	Front Seat	Rear Seat	All[2]
Sex			
Male	39.4	29.8	38.5
Female	50.7	28.2	48.5
Age			
0–3	66.1	72.3	59.1
4–15	53.3	31.3	38.7
16–29	37.7	5.2	36.4
30–59	45.0	6.6	44.2
60+	55.6	13.0	54.0
Type of Vehicle			
Small Car	48.9	32.7	47.5
Mid-Sized Car	47.2	32.0	45.8
Large Car	42.3	23.7	40.3
Pickup Truck	30.6	11.2	30.3
Van	40.2	33.5	38.2
Other	55.4	22.4	52.1
Site Type			
Intersection	42.6	29.0	41.2
Freeway Exit	51.1	28.7	49.5
Day of Week			
Monday	47.0	47.7	46.6
Tuesday	47.7	33.0	46.6
Wednesday	43.6	28.1	42.1
Thursday	45.0	28.1	44.0
Friday	46.8	34.6	45.8
Saturday	40.5	19.9	38.1
Sunday	39.1	24.4	36.6

TABLE 3.1 Continued

	Seating Location		
	Front Seat	Rear Seat	All[2]
Time of Day			
7-9 AM	45.9	35.5	45.3
9-10 AM	44.4	24.0	42.2
10-11 AM	46.0	27.9	44.3
11-12 AM	46.1	34.1	44.8
12-1 PM	47.1	31.3	45.7
1-2 PM	44.7	34.0	43.5
2-3 PM	42.9	30.6	41.7
3-4 PM	39.8	20.8	38.0
4-5 PM	44.2	26.2	42.2
5-6 PM	41.7	–	41.7
Weather			
Sunny	40.8	27.0	39.6
Cloudy	42.1	26.5	40.3
Rain	52.7	41.4	51.9
Snow	47.3	32.8	46.2
MDOT Region			
Western U.P.	42.6	19.6	40.8
Eastern U.P.	34.6	26.7	33.6
Northwest	46.5	50.8	46.6
Northeast	39.4	32.6	38.4
West Central	38.9	22.9	36.6
East Central	52.2	41.4	51.3
Southwest	41.6	21.5	40.1
Southeast	50.1	33.6	48.0
Metro Detroit	43.8	27.2	42.4
TOTAL	44.5	28.9	43.0

[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 seating positions (i.e., on laps, in cargo area, on floor).

FIGURE 3.2

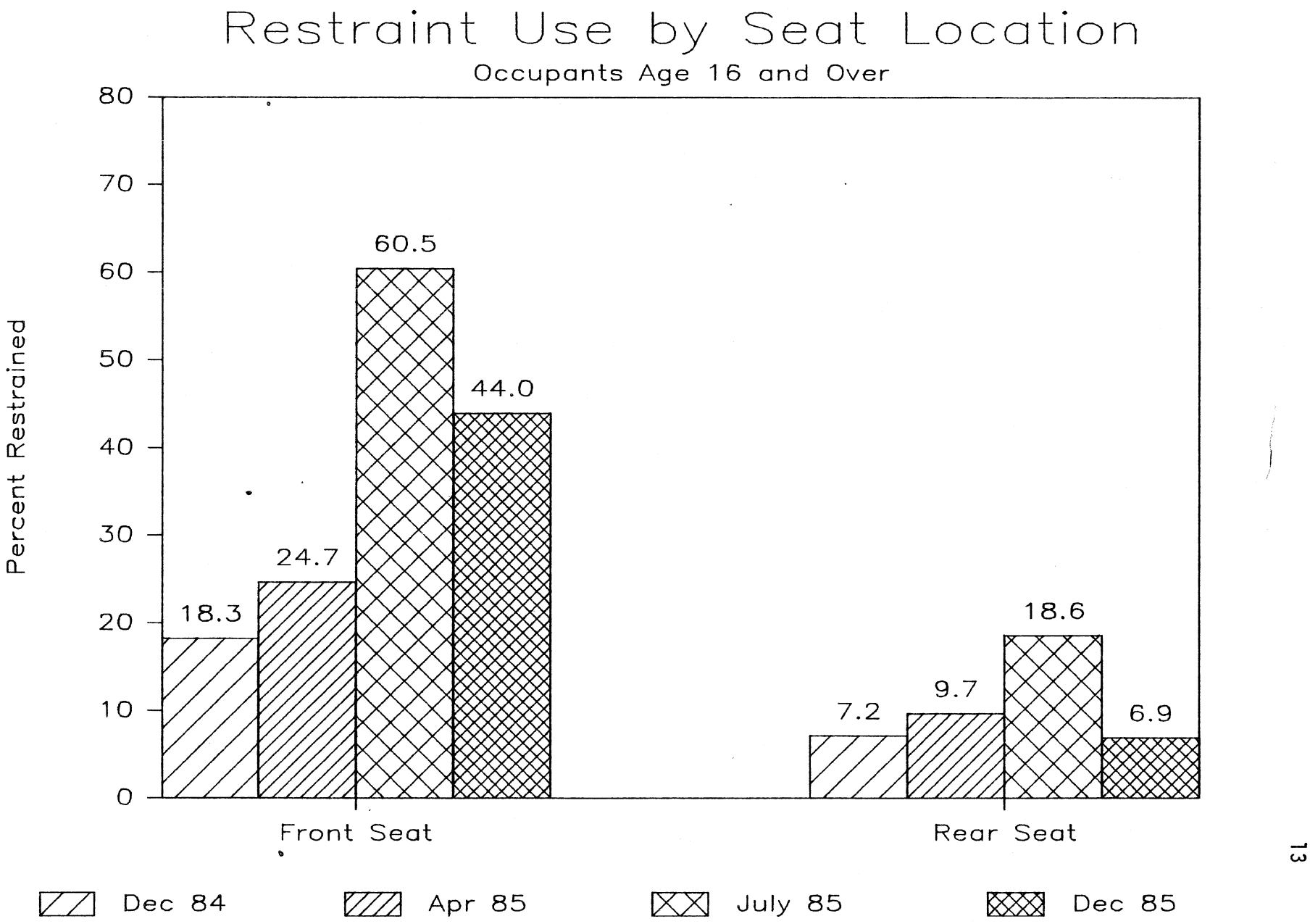

Restraint Use by Seat Location
Occupants Age 16 and Over
Percent Restrained
80
70
60
50
40
30
20
10
0
18.3
24.7
60.5
44.0
7.2
9.7
18.6
6.9
Front Seat
Rear Seat
Dec 84
Apr 85
July 85
Dec 85

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

Age Group	Seating 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	–	14.2	31.1	20.1	7.2	9.9	–	–	0.8	14.4
% Correct CRD	–	22.4	35.7	45.2	49.2	55.6	–	–	–	36.1
% Incorrect CRD	–	5.4	14.4	12.5	9.8	12.4	–	–	–	9.6
% Restrained[3]	–	42.1	81.3	76.0	66.2	74.0	–	–	0.8	59.1
Unweighted N	–	48	73	69	59	78	0	0	53	385
Age 4–15										
% Restrained	100.0	28.2	56.6	38.0	16.8	35.8	14.0	0.0	10.1	38.7
Unweighted N	1	66	453	227	175	256	16	23	9	1,244
Age 16–29										
% Restrained	41.5	4.1	27.1	13.2	0.0	2.6	0.0	0.0	–	36.4
Unweighted N	3,539	64	1,101	56	33	98	2	1	0	4,894
Age 30–59										
% Restrained	45.7	15.2	42.3	4.0	0.0	9.2	0.0	0.0	–	44.2
Unweighted N	7,214	22	1,489	53	19	98	3	4	0	8,902
Age 60+										
% Restrained	55.2	21.1	56.8	9.9	0.0	16.2	0.0	0.0	–	54.0
Unweighted N	1,332	9	617	17	7	48	3	1	0	2,034
All Ages										
% Restrained	45.4	22.1	42.5	34.1	22.5	28.6	9.2	0.0	2.3	43.0
Unweighted N	12,106	211	3,744	426	295	580	24	29	62	17,500

[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

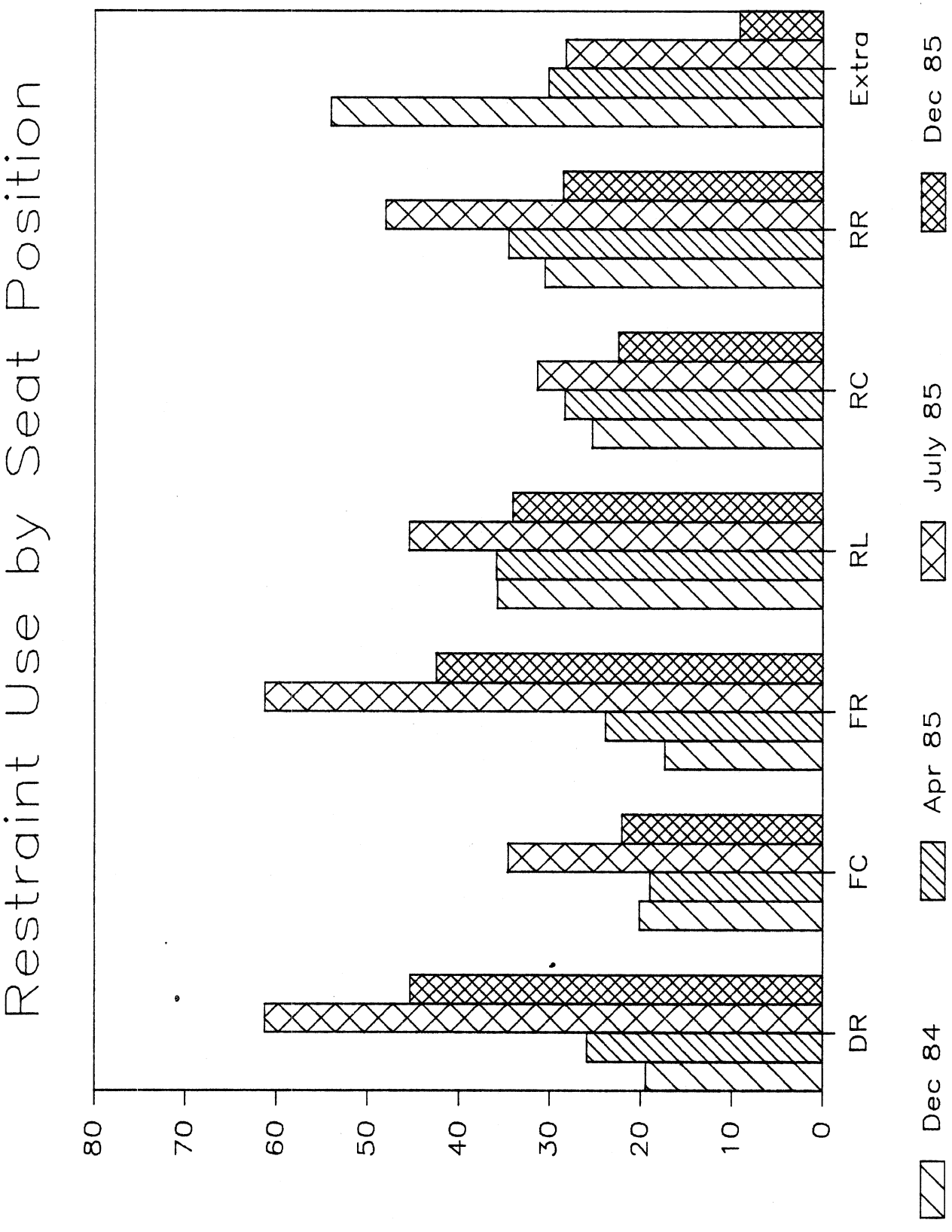
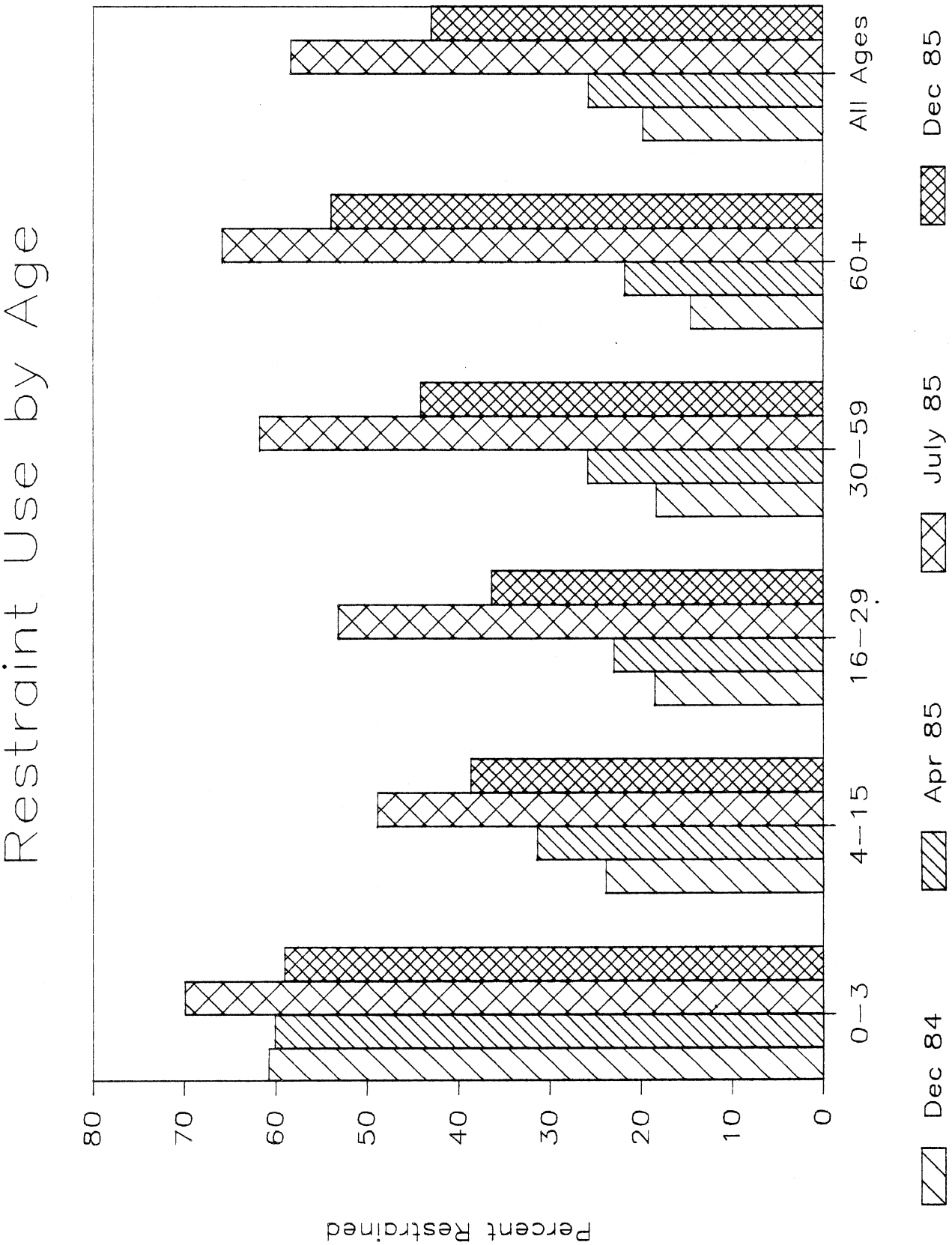

Restraint Use by Seat Position
Percent Restrained
0
10
20
30
40
50
60
70
80
DR
FC
FR
RL
RC
RR
Extra
Dec 84
Apr 85
July 85
Dec 85

FIGURE 3.4


Restraint Use by Age
Percent Restrained
0
10
20
30
40
50
60
70
80
0-3
4-15
16-29
30-59
60+
All Ages
Dec 84
Apr 85
July 85
Dec 85

1984).

Misuse of child restraint devices continues to be an issue of concern. Throughout the series of observational surveys, misuse has remained at a constant level. Approximately 20% of all child restraint devices observed have been used incorrectly. As a result of the data collection process used in this survey, misuse is limited only to cases **obvious** to the observer. The data presented here should be considered a minimum estimate of incorrect use.

Restraint use among the other age groups also decreased from July to December. Use rates were observed as follows: 4-15-year-olds, 38.7%, down from 48.9% in July; 16-29-year-olds, to 36.4% from 53.2%; and 30-59-year-olds, to 44.2% from 61.8%. When drivers alone are examined, the pattern by age is similar (Figure 3.5).

The mandatory restraint use law appears to have had the greatest effect on occupants age 60 and over. Immediately after the law went into effect, this cohort increased its use rate to a level higher than any other age group except young children. The current use rate for this group remains high, 54.0%. Although rates did decrease in the current wave, the decrease for this group was smaller than the 4-15-year-olds, 16-29-year-olds, or 30-59-year-olds. The twelve-month increase (December, 1984 to December, 1985) is significantly greater among those age 60 and over (269.9%) than among the younger three groups: 4-15 (61.9%), 16-29 (96.8%), and 30-59 (140.2%).

Among occupants age 60 and over, front-right passengers have a slightly higher use rate, 56.8%, than drivers, 55.2% (Table 3.2). In all other age groups, drivers have a higher use rate than front-right passengers.

The law seems to be having the same effect on males as females. Females (48.5%) continue to use restraints more often than males (38.5%; Table 3.3). Both sexes, however, were influenced by the law similarly. Between December, 1984, and December, 1985, use among female occupants increased 121.5%. Use among males increased 120.0% in the same period.

The pattern of restraint use by vehicle size has remained essentially the same in all waves (Table 3.3 and Figure 3.6).[1] Occupants of small cars are more likely to use restraints (47.5%) than occupants of either mid-sized (45.8%) or large cars (40.3%). Riders in pickup trucks continue to have the lowest restraint use (30.3%) followed by those in vans (38.2%). Unlike previous waves, occupants of other vehicles (including truck-based station wagons and utility vehicles), had a higher use rate (52.1%) than any other vehicle size.

In the twelve-month period between December, 1984, and December, 1985, pickup trucks had the second largest percentage increase in belt use, 191.3%, followed by large cars, which jumped 148.8%. Restraint use for the "other vehicle type" category increased 202.9%, more than any other vehicle size or type. This may be because more of these vehicles are on the roads. In the

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[1]Data on the type of vehicle were not collected during April, 1985. During this wave license plate numbers were recorded, but this practice proved to be problematic. Readers are referred to the April report for details.

FIGURE 3.5

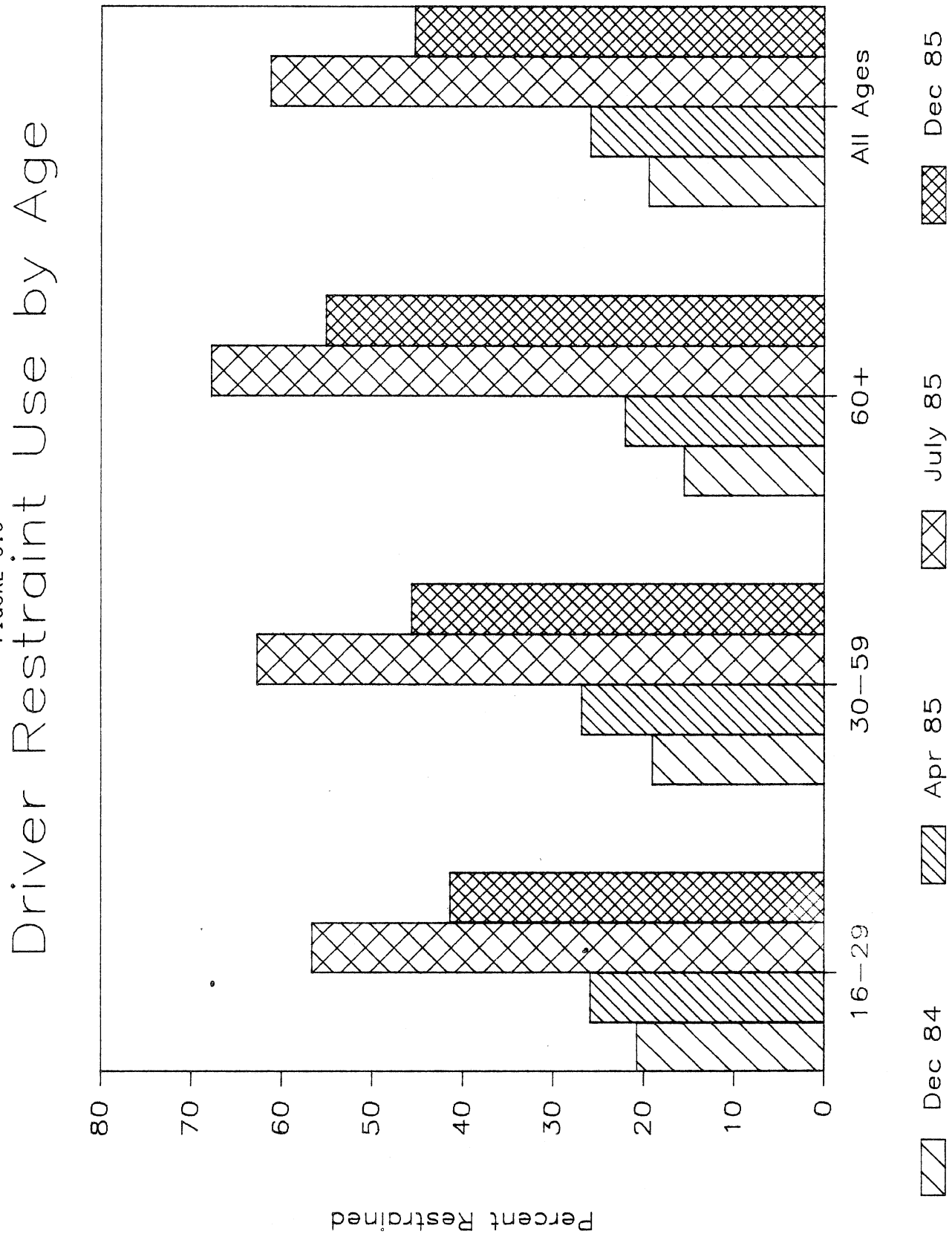
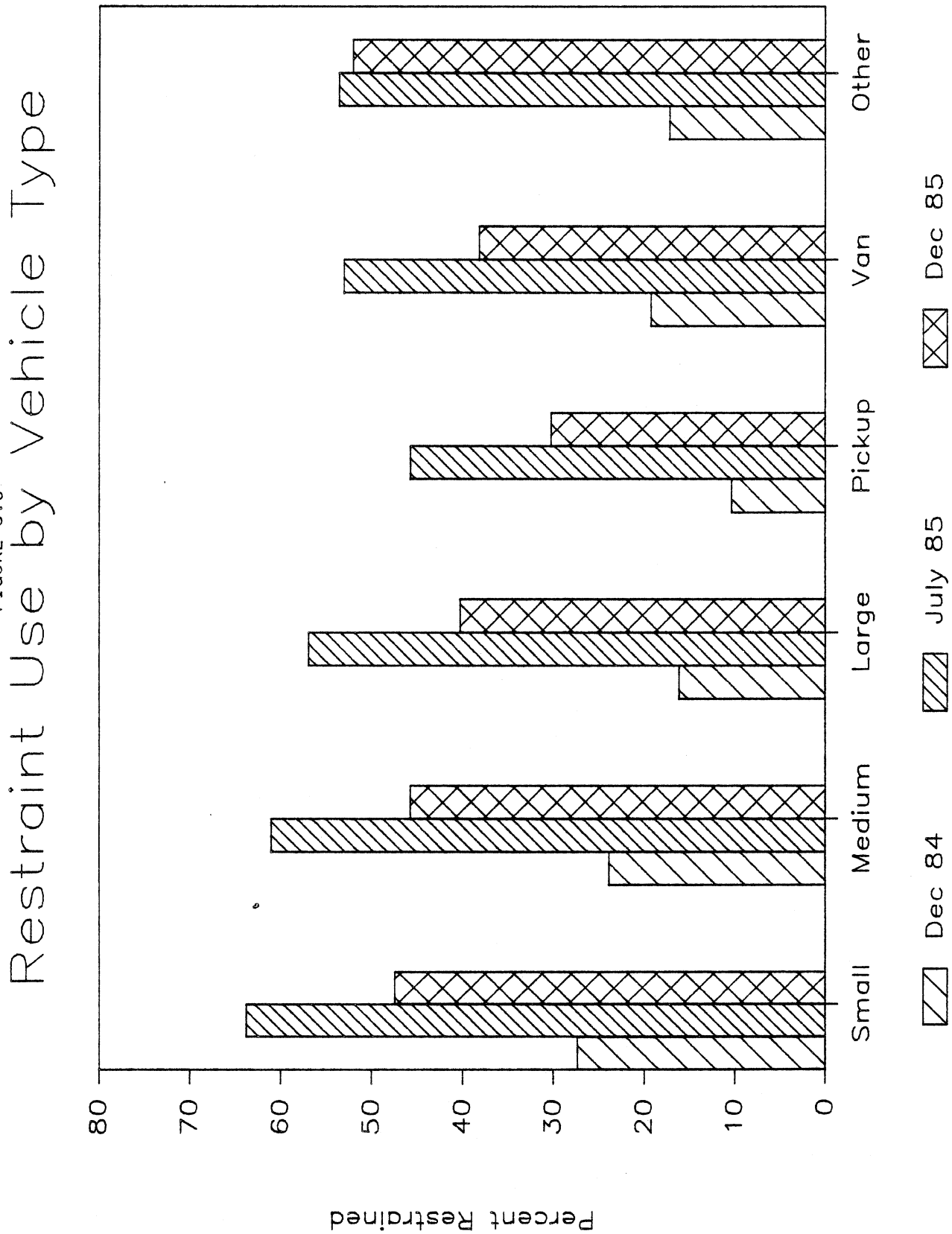

Driver Restraint Use by Age
Percent Restrained
0
10
20
30
40
50
60
70
80
16—29
30—59
60+
All Ages
Dec 84
Apr 85
July 85
Dec 85

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

	Seating Position							
	Driver	Front Center	Front Right	Rear Left	Rear Center	Rear Right	Extra Seats[2]	All[3]
Sex								
Male	40.6	23.0	32.7	31.7	23.8	31.6	15.8	38.5
Female	53.2	21.8	47.4	36.9	20.6	27.4	0.0	48.5
Type of Vehicle								
Small Car	49.8	–	45.7	42.6	25.9	29.4	–	47.5
Mid-Sized Car	48.5	20.3	43.7	37.0	20.3	34.7	–	45.8
Large Car	42.8	26.0	41.7	26.5	19.3	23.6	50.0	40.3
Pickup Truck[4]	32.3	22.4	26.0	0.0	100.0	0.0	–	30.3
Van	39.0	0.0	46.0	35.6	37.6	27.6	0.0	38.2
Other	53.7	–	61.5	17.4	20.8	27.4	–	52.1
Observation Site								
Intersection	43.5	21.9	40.1	34.4	21.8	28.8	10.5	41.2
Freeway Exit	52.1	23.2	48.6	33.0	25.5	27.7	0.0	49.5
Weather Conditions								
Mostly Sunny	41.0	50.7	39.9	44.0	8.9	24.1	0.0	39.6
Mostly Cloudy	43.3	16.8	39.9	30.2	20.6	27.0	10.4	40.3
Raining	53.3	30.5	51.4	49.4	29.2	40.6	–	51.9
Snowing	47.8	26.2	46.5	38.4	29.2	31.0	0.0	46.2
TOTAL	45.4	22.1	42.5	34.1	22.5	28.6	9.2	43.0

[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 24 observed occupants.
[3]Restraint use for all positions includes cargo areas, passengers held in laps, and passengers standing.
[4]Data on reat seat passengers includes six occupants, riding in crew cabs.

FIGURE 3.6


Restraint Use by Vehicle Type
Percent Restrained
0
10
20
30
40
50
60
70
80
Small
Medium
Large
Pickup
Van
Other
Dec 84
July 85
Dec 85

current wave, a total of 12,106 vehicles were observed. Of those observed, 385 were vehicles categorized as "other." This is compared with 312 out of 12,263 observed in July. Perhaps there is a growing popularity of utility vehicles and an increasing use of these vehicles by families. This theory is based on small numbers, however, and observed differences may simply be due to sampling error.

Throughout the series of surveys, occupants in vehicles exiting a freeway ramp had a higher rate of restraint use (49.5%) than occupants in vehicles at local intersections (41.2%; Table 3.3). Use observed at local intersections has increased more between December, 1984, and December, 1985, than use at freeway exits (119.1% versus 112.4%).

Weather conditions appear to have little influence on restraint use (Table 3.3). There was no consistent pattern across the waves in restraint use by weather conditions. Although in the current wave use was higher during rainy and snowy conditions than at other times.

There was no consistent pattern of belt use across time of day and day of week (Table 3.4). The twelve-month percent change was greatest on Tuesday, increasing 149.1%, and Wednesday, 132.5%. Restraint use on Thursday increased the least, 84.1%. Percent changes for the other days ranged between 102.6% and 112.8%. Percent changes for the twelve-month period ranged from 50.0% (5-6 p.m.) to 166.8% (10-11 a.m.).

Geographic region continues to be a factor in restraint use (Table 3.5 and Figure 3.7). The lowest use in the latest survey was observed in the Eastern upper peninsula (33.6%), which has consistently had the lowest rate of restraint use. The Southeast region had the highest rate in the first three surveys, but was surpassed by the East Central region in the current wave.

Large differences in restraint use can be clearly seen when examining restraint use by sampling area (Table 3.6). Rural and central-city areas have lower rates of restraint use. The lowest use of restraints was observed in the City of Detroit (25.4%) followed by Wayne County, City of Melvindale (30.1%), Delta County (31.6%), and Mecosta-Newaygo Counties (31.7%). The highest use rates were observed in Washtenaw County, City of Ann Arbor (63.5%), Ingham County, City of East Lansing (61.9%), and Wayne County, Canton Township (61.5%).

Decreases in restraint use between July and December, 1985, wave were experienced in all the sampling areas except St. Clair County, which increased use to 51.4% from 45.6% in July, and Wayne County, Canton Township, which increased to 61.5% from 57.9% in July. These increases within a single sampling area are based on a small number of cases, however, and may be due to sampling error.

Mandatory seat belt legislation appears to have had a greater effect in St. Clair County, Delta County, and the City of Melvindale than other sampling areas. Current use in Delta County and the City of Melvindale has increased more than 200% over use in December, 1984. The largest increase over the year was in St. Clair County, where use of seat belts increased 307.9% since December, 1984. One reason for these large percentage increases is the low pre-legislation rates of belt use in these areas.

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

	Seating Position							
	Driver	Front Center	Front Right	Rear Left	Rear Center	Rear Right	Extra Seats[2]	All[3]
Time of Day								
7-9 AM	46.3	54.3	43.2	45.7	6.2	44.2	–	45.3
9-10 AM	45.0	18.2	42.9	28.1	18.8	24.0	40.0	42.2
10-11 AM	46.4	26.5	45.7	32.8	21.1	27.2	0.0	44.3
11-12 AM	46.3	38.5	45.9	39.9	32.9	31.0	0.0	44.8
12-1 PM	48.0	15.0	45.9	35.1	31.4	28.8	–	45.7
1-2 PM	45.8	7.9	42.6	37.2	28.2	35.2	–	43.5
2-3 PM	44.0	22.3	40.8	36.7	22.3	29.9	0.0	41.7
3-4 PM	41.9	5.8	35.3	26.0	12.5	21.6	–	38.0
4-5 PM	45.5	17.0	41.5	31.7	22.6	24.1	0.0	42.2
5-6 PM	50.0	–	16.7	–	–	–	–	41.7
Day of Week								
Monday	47.6	7.3	46.1	54.8	42.5	45.3	0.0	46.6
Tuesday	49.4	17.2	42.9	35.2	25.3	34.2	–	46.6
Wednesday	44.9	16.4	40.2	36.8	17.3	27.2	0.0	42.1
Thursday	45.7	31.3	42.4	38.8	31.0	21.3	–	44.0
Friday	47.2	28.6	46.0	36.9	35.1	32.7	–	45.8
Saturday	40.5	29.1	41.3	25.2	15.5	19.2	45.4	38.1
Sunday	39.6	20.6	39.6	27.0	12.2	29.3	0.0	36.6
TOTAL	45.4	22.1	42.5	34.1	22.5	28.6	9.2	43.0

[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 24 observed occupants.
[3]Restraint use for all positions includes cargo areas, passengers held in laps, and passengers standing.

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

MDOT Region	Seating Position							
	Driver	Front Center	Front Right	Rear Left	Rear Center	Rear Right	Extra Seats[2]	All[3]
1. Western U.P.	42.1	34.8	44.6	23.7	24.9	15.1	–	40.8
2. Eastern U.P.	35.0	12.5	35.5	32.3	14.3	29.4	–	33.6
3. Northwest	45.4	23.1	51.3	54.5	53.3	45.8	0.0	46.6
4. Northeast	40.0	0.0	39.4	43.5	0.0	28.6	–	38.4
5. West Central	40.0	17.8	37.5	32.9	12.5	21.3	0.0	36.6
6. East Central	52.9	18.3	51.7	44.0	28.8	47.0	0.0	51.3
7. Southwest	43.0	15.1	39.0	21.3	15.2	26.2	0.0	40.1
8. Southeast	50.6	39.6	49.1	29.5	31.9	36.7	66.7	48.0
Metro Detroit	44.8	24.5	40.4	34.4	23.5	24.2	0.0	42.4
TOTAL	45.4	22.1	42.5	34.1	22.5	28.6	9.2	43.0

[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 24 observed occupants.
[3]Restraint use for all positions includes cargo areas, passengers held in laps and passengers standing.

FIGURE 3.7

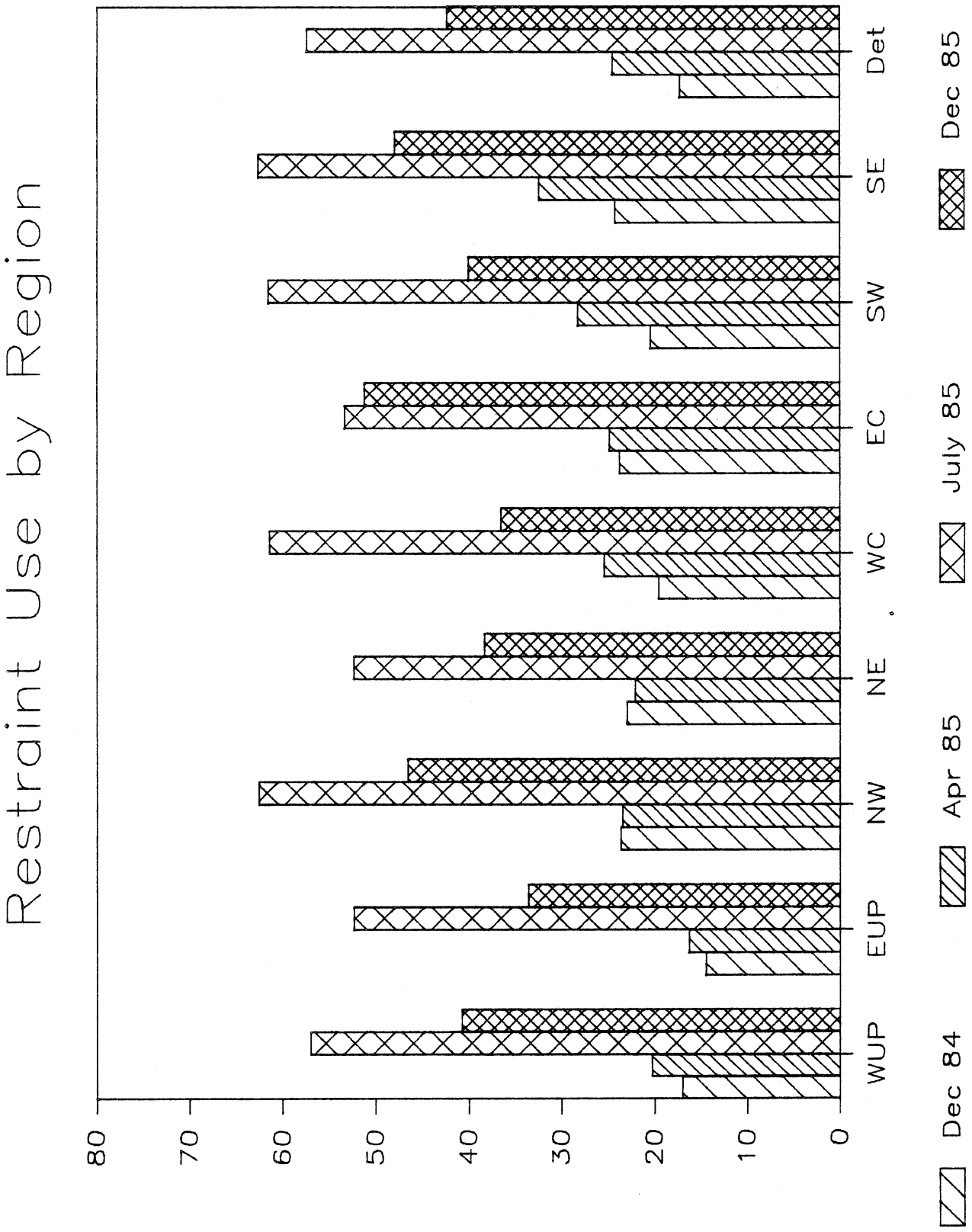

Restraint Use by Region
Percent Restrained
0
10
20
30
40
50
60
70
80
WUP
EUP
NW
NE
WC
EC
SW
SE
Det
Dec 84
Apr 85
July 85
Dec 85

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	359	35.3	33.1	34.3
Bay	204	268	60.8	56.9	57.8
Berrien County	204	278	40.7	40.0	38.5
Berrien, Niles	204	288	45.1	34.4	39.9
Charlevoix	204	284	40.7	43.5	42.6
Chippewa	204	387	38.2	36.4	35.1
Crawford-Roscommon	204	324	35.8	35.7	33.0
Delta	204	297	31.9	28.6	31.6
Dickinson	204	283	33.8	33.3	33.6
Eaton	204	310	39.2	36.9	36.1
Genesee	612	804	50.3	48.4	49.4
Grand Traverse	204	293	54.4	60.0	56.3
Ingham County	204	328	50.5	51.7	48.8
Ingham, East Lansing	203	286	62.6	60.5	61.9
Iosco-Alcona	204	283	44.1	40.6	44.5
Jackson	204	274	43.1	45.3	43.1
Kalamazoo County	204	276	54.4	49.2	52.2
Kalamazoo City	204	252	52.5	43.6	50.8
Kent County	204	279	49.5	53.2	50.2
Kent, Grand Rapids	201	314	41.3	40.1	38.9
Kent, Wyoming	204	351	40.2	31.3	34.5
Lapeer	192	261	51.7	37.8	48.5
Lenawee[3]	204	317	37.3	40.5	36.0
Macomb	612	827	51.0	41.8	48.5
Marquette	406	641	46.3	47.2	44.0
Mason	204	312	41.2	45.0	41.0
Mecosta-Newaygo	204	303	36.8	24.4	31.7
Monroe[3]	191	321	40.1	39.1	36.7
Montcalm[3]	204	303	42.6	47.1	41.3
Muskegon	157	264	26.0	23.6	23.4
Oakland County	1,019	1,290	57.3	58.8	57.0
Oakland, Royal Oak	204	281	56.9	65.6	59.4
Ottawa	204	394	43.6	37.4	38.6
Saginaw	408	637	53.9	54.2	52.6
St. Clair	204	284	52.0	43.9	51.4
VanBuren	169	231	33.7	31.0	32.1
Washtenaw, Ann Arbor	185	275	69.0	60.5	63.5
Wayne, Detroit	1,428	2,090	28.7	23.2	25.4
Wayne, Canton	204	270	59.8	64.8	61.5
Wayne, Garden City	204	263	47.1	38.0	45.6
Wayne, Livonia	204	254	58.3	57.9	56.7
Wayne, Melvindale etc.	203	274	32.1	34.9	30.1
Wayne, Trenton etc.	204	322	37.3	38.0	36.0
Wayne, Wyandotte	204	268	47.5	41.5	45.5
TOTAL	12,106	17,500	45.4	41.5	43.0

[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.

Most state agencies have required the use of seat belts by their employees when traveling in state-owned vehicles since 1978. In December, 1985, 26 state vehicles were observed with 28 occupants. Of the 28 occupants, 21 were restrained (75%). A total of 53 other government vehicles were observed, with 60 occupants. Thirty-three of the occupants riding in other government vehicles were restrained (55%). Obviously these estimates, based on a small number of cases, need to be interpreted with care.

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; and riding on the lap of another occupant. As was found in the July wave, the most common nonstandard position for occupants age 0-3 was riding on the lap of another occupant. Sitting forward on the edge of the rear-seat or standing on the floor of the rear-seat were the most common nonstandard positions among 4-15-year-olds. Passengers sharing seat belts are also of concern. In two cases observed in the current wave, a young passenger was riding on the lap of another occupant, with both belted with the same belt. In the third case, the occupants sat side by side in the same seat belt. Although these passengers were trying to obey the seat belt law, such misuse of seat belts is particularly hazardous for the small child, who absorbs most of the force in a crash.

The percent of belted occupants misusing seat belts is presented in Table 3.8 (incorrect use here does not include the misuse of child restraint devices). Five percent of all occupants using seat belts were using the systems incorrectly, compared with 5.9% in July. Of the 350 observed cases of misuse, 344 involved front-seat occupants, driver or right-front passenger, placing the shoulder harness under the outboard arm, behind the back, or over the inside shoulder. The remaining six occupants represented three instances of shared seat belts as described above. Occupants misusing seat belts by placing the shoulder harness under the arm or behind the back are considered in violation of the law by The Michigan Office of Highway Safety Planning (OHSP). An OHSP policy statement also considers occupants sharing seat belts to be in violation (Coleman, 1985).

Misuse was more common among right-front passengers than drivers (7.3 versus 4.7%); higher among females than males (6.1 versus 3.9%); was observed more often among occupants age 60 and over (7.4%) than those of other ages; and was more common among occupants of large cars (6.4%) than those in any other type of vehicle.

During the July wave some drivers and front-right occupants employed methods to **appear** restrained, when they were not. To appear restrained, front-seat outboard occupants simply slipped the outboard arm through the shoulder belt. In other cases, front-seat occupants held the seat belt in position. At a glance, these occupants appeared to be restrained; however, on closer inspection observers identified the lack of belt use. If the seat belt was not buckled, they were coded as unrestrained. These attempts at deception were more prevalent during the July wave (immediately after belt use was required by law) than previously or later. This deception is distinct from a motorist's quickly buckling up after noticing an observer. After the law took effect,

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

	Age of Occupant		
Position	0–3	4–15	16+
Lying			
Front seat	0	1	0
Rear seat	1	3	0
Cargo area	0	0	1
Standing			
Front seat	6	4	0
Front floor	0	0	0
Rear seat	2	7	0
Rear floor	4	13	0
Cargo area	0	1	0
Between bucket seats	1	0	0
Kneeling			
Front seat	0	0	0
Rear seat	0	6	0
Sitting			
On edge of rear seat	2	13	0
Between bucket seats	0	0	1
On lap	53	9	0
On Rear floor	0	1	0
On Front floor	0	0	0
Shared seat belt	1	2	3
Total occupants in nonstandard positions	69	60	5
Total occupants in all positions	385	1,244	15,830

[1] Data are not weighted.

TABLE 3.8
Percent of Belted Occupants with Incorrect Use[1]

	Age					
	0-3	4-15	16-29	30-59	60+	All
Position						
Driver	–	0.0	4.1	4.7	6.6	4.7
Front Right	3.8	13.1	4.8	5.5	9.3	7.3
Vehicle Type						
Small	1.5	8.6	3.3	4.0	3.9	3.9
Medium	0.0	6.7	4.5	4.7	6.9	5.0
Large	0.0	1.7	6.1	6.0	9.6	6.4
Pickup	0.0	0.0	6.4	4.5	6.3	4.9
Van	8.7	11.1	3.7	2.8	6.4	4.3
Other	0.0	17.7	2.1	5.6	0.0	5.5
Sex						
Male	2.1	6.8	2.9	3.7	5.0	3.9
Female	0.0	6.9	4.9	6.0	9.9	6.1
Observation Site						
Intersection	1.3	6.6	4.1	4.7	6.9	4.9
Freeway Exit	0.0	8.2	4.2	5.0	10.0	5.3
Weather Conditions						
Mostly Sunny	0.0	11.4	10.8	5.2	11.9	7.9
Mostly Coudy	0.0	5.7	2.4	3.9	6.3	3.8
Rain	0.0	7.0	5.9	5.1	7.3	5.5
Snow	3.4	7.7	5.1	5.9	7.7	6.0
Time of Day						
7-9	0.0	2.4	5.2	3.1	3.7	3.6
9-10	6.5	3.1	6.2	4.1	3.4	4.5
10-11	0.0	2.8	4.6	6.7	10.9	6.5
11-12	0.0	8.1	5.7	3.4	7.3	4.7
12-1	0.0	11.1	3.7	5.7	7.1	5.5
1-2	5.3	15.0	2.7	7.1	9.0	6.7
2-3	0.0	9.7	4.0	4.6	9.2	5.3
3-4	0.0	5.0	3.8	3.9	7.5	4.2
4-5	0.0	3.9	1.4	4.0	4.0	3.3
5-7	–	–	–	–	–	–
Day of Week						
Monday	4.4	6.5	5.9	6.2	8.5	6.4
Tuesday	0.0	8.1	5.3	6.4	7.4	6.2
Wednesday	0.0	7.5	4.2	4.2	10.4	5.1
Thursday	0.0	11.2	4.0	4.8	10.0	5.5
Friday	2.7	9.8	4.5	4.9	5.8	5.1
Saturday	0.0	1.3	1.2	2.5	2.2	2.0
Sunday	0.0	6.3	2.1	3.5	6.2	3.8
TOTAL	1.0	6.8	4.1	4.8	7.4	5.0

[1]All percents are based on analyses weighted according to the sample design to accurately represent the entire state. Misuse includes all forms of incorrect use of seat belts, but does not include incorrectly used child restraint devices.

some motorists were observed continuously traveling so as to appear restrained, presumably to deceive law enforcement officials. The practice of continuously traveling with an arm through an unbuckled three-point belt was not observed before implementation of the law, and was rarely seen in December, 1985, five months after the law first took effect. It seems evident that persons attempting to deceive law enforcement officials quickly discovered there was little likelihood of being stopped for violating the law and so dropped the charade of pretending to buckle up.

Restraint use in the State of Michigan decreased 26.4% the first five months the mandatory seat belt law was in effect. This significant decrease, and evidence that motorists no longer pretend to buckle up, may indicate that public perception of enforcement of the law is low. A low perceived risk may result from a low rate of enforcement. Modest enforcement efforts may be the result of the law itself, which restricts officers to secondary enforcement. Secondary enforcement means that a police officer is not permitted to stop and cite a motorist solely for violating the belt law. A belt law citation may be issued **only** if the motorist is first stopped for some other violation.

Success of the seat belt law largely depends on the public's believing that they are at risk of being detected and cited if they do not use seat belts. To maintain reasonably high levels of perceived risk of detection and citation, several requirements must be met. First, the law should permit officers **primary** enforcement of the law. Prohibiting police officers from primary enforcement sends a mixed message to the public (and to police officers) concerning the seriousness of failure to use belts. Second, the number of citations issued for violation of the belt law should be substantially increased. Third, extensive publicity of these enforcement actions is needed to make motorists aware of enforcement activities and to increase their perceived risk of receiving a citation.

Results of this series of surveys demonstrate that a mandatory belt law can dramatically increase the proportion of motorists protected by seat belts. Results also show, however, that some of these beneficial effects diminish without extensive enforcement and effective publicity.

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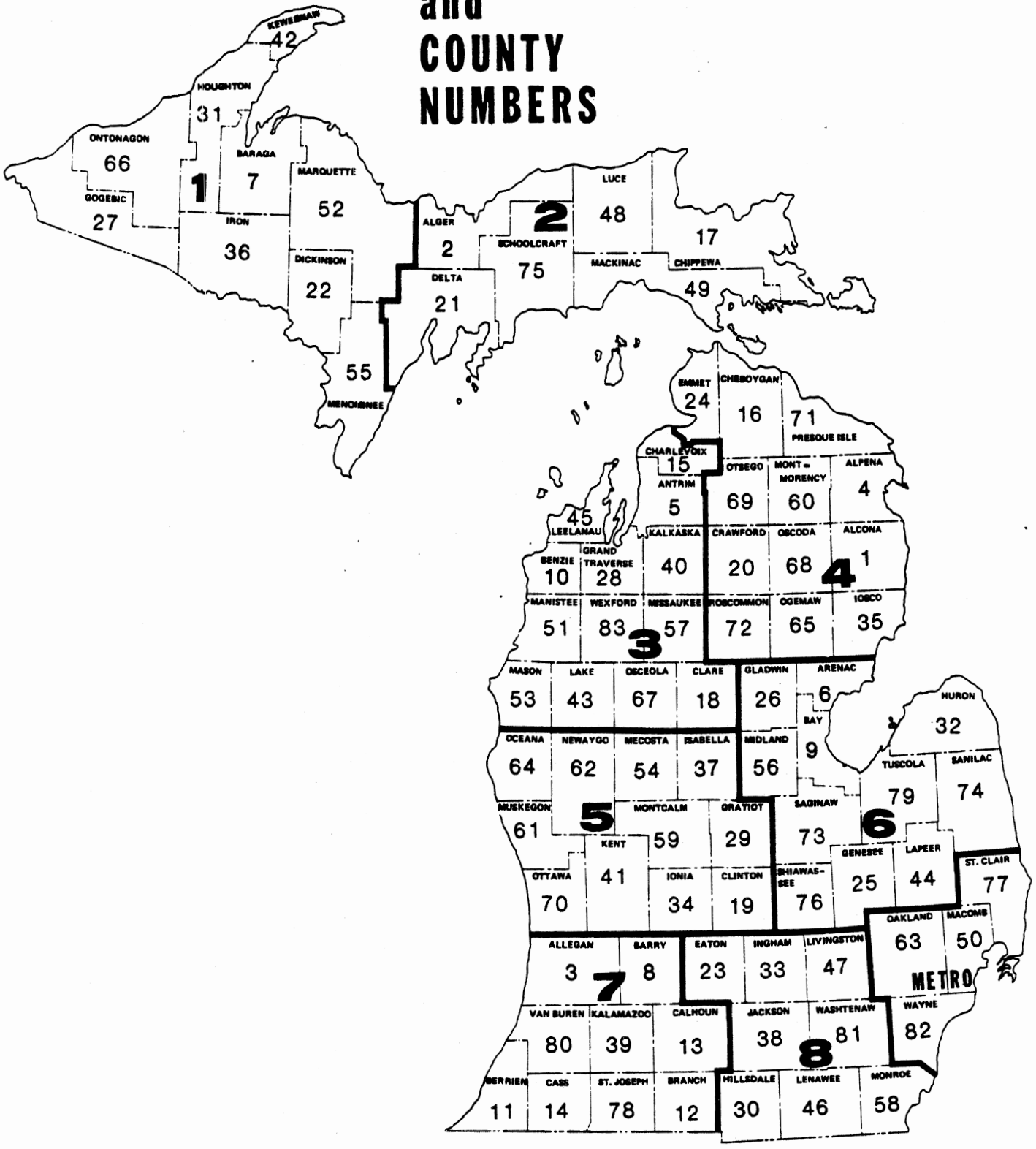
Appendix A

MICHIGAN DEPARTMENT OF TRANSPORTATION REGION MAP

DISTRICT and COUNTY NUMBERS



Appendix B

SEAT BELT SURVEY CODEBOOK

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
190	79.2	1. Intersection
50	20.8	2. Freeway Exit

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

FREQ	Prcnt	SITE CHOICE
239	99.6	1. Primary
1	0.4	2. Secondary

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

FREQ	Prcnt	MONTH
0	0.0	01. January
0	0.0	02. February
0	0.0	03. March
0	0.0	04. April
0	0.0	05. May
0	0.0	06. June
0	0.0	07. July
0	0.0	08. August
0	0.0	09. September
0	0.0	10. October
0	0.0	11. November
240	100.0	12. December

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

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

FREQ	Prcnt	START HOUR
2	0.8	07.
22	9.2	08.
25	10.4	09.
35	14.6	10.
32	13.3	11.
25	10.4	12.
25	10.4	13.
30	12.5	14.
27	11.2	15.
17	7.1	16.

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
33	13.7	1. Monday
33	13.7	2. Tuesday
33	13.7	3. Wednesday
40	16.7	4. Thursday
44	18.3	5. Friday
30	12.5	6. Saturday
27	11.2	7. Sunday

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

FREQ	Prcnt	WEATHER
20	8.3	1. Mostly Sunny
124	51.7	2. Mostly Cloudy
18	7.5	3. Rain
78	32.5	4. Snow

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
10	4.2	08.
20	8.3	09.
37	15.4	10.
32	13.3	11.
30	12.5	12.
23	9.6	13.
29	12.1	14.
31	12.9	15.
26	10.8	16.
2	0.8	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

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
90	37.5	1. Observer #1
40	16.7	2. Observer #2
13	5.4	3. Observer #3
97	40.4	4. Observer #4

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

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Vehicle variables

Variabels 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
4576	37.8	1. Observer #1
1991	16.4	2. Observer #2
643	5.3	3. Observer #3
4896	40.4	4. Observer #4

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

FREQ	Prcnt	VEHICLE TYPE
3324	27.5	1. Small Car
3447	28.5	2. Midsize Car
2985	24.7	3. Large Car
1360	11.2	4. Pickup
579	4.8	5. Van
385	3.2	6. Other
26	0.2	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
4	0.0	04.
16	0.1	16.
33	0.3	33.
38	0.3	38.
39	0.3	39.

FREQ	Prcnt	Var 23 SITE # COUNT
96	0.8	48.
300	2.5	50.
11526	95.2	51.
54	0.4	54.

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

FREQ	Prcnt	NUMBER OF VEHICLES COUNTED BY THIS OBSERVER
4	0.0	04.
16	0.1	16.
33	0.3	33.
38	0.3	38.
39	0.3	39.
96	0.8	48.
300	2.5	50.
11526	95.2	51.
54	0.4	54.

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
12	0.1	07.
939	7.8	08.
1148	9.5	09.
1647	13.6	10.
1796	14.8	11.
1233	10.2	12.
1197	9.9	13.
1560	12.9	14.
1425	11.8	15.
1131	9.3	16.
18	0.1	17.

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

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
12106	100.0	04. Wave 4

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

FREQ	Prcnt	DRIVER BELTED (Y/N)
6620	54.7	1. Not Belted
5471	45.2	2. Belted
15	0.1	8. Missing data

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

FREQ	Prcnt	DRIVER RESTRAINT USE
6620	54.7	1. Not Belted
5471	45.2	2. Belted
0	0.0	3. CRD Correct
0	0.0	4. CRD Wrong
15	0.1	8. Missing Data

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

FREQ	Prcnt	DRIVER SEX
7483	61.8	1. Male
4606	38.0	2. Female
17	0.1	8. Missing Data

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

FREQ	Prcnt	DRIVER AGE
0	0.0	1. 0-3
1	0.0	2. 4-15
3539	29.2	3. 16-29
7214	59.6	4. 30-59
1332	11.0	5. 60+
20	0.2	8. Missing Data

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
12106	69.2	01. Front Left
211	1.2	02. Front Center
3744	21.4	03. Front Right
426	2.4	04. Rear Left
295	1.7	05. Rear Center
580	3.3	06. Rear Right
62	0.4	07. In Lap
29	0.2	08. Cargo Area
24	0.1	09. Extra Seat
23	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)
9887	56.5	1. Not Belted
7506	42.9	2. Belted (any type)
107	0.6	8. Missing Data

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

FREQ	Prcnt	RESTRAINT USE
9887	56.5	1. Not Belted
7321	41.8	2. Belted
148	0.8	3. CRD OK
37	0.2	4. CRD Wrong
107	0.6	8. Missing Data

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

FREQ	Prcnt	SEX
9469	54.1	1. Male
7951	45.4	2. Female
80	0.5	8. Missing Data

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

FREQ	Prcnt	AGE
385	2.2	1. 0-3
1244	7.1	2. 4-15
4894	28.0	3. 16-29
8902	50.9	4. 30-59
2034	11.6	5. 60+
41	0.2	8. Missing Data

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

FREQ	Prcnt	SPECIAL TAG
17150	98.0	00. None
350	2.0	01. Shoulder belt misused
0	0.0	02. Lap belt misused