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EVALUATION OF NEW YORK STATE'S MANDATORY OCCUPANT RESTRAINT LAW

Volume VI: Final Summary Report

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16. Abstract

This is the final report summarizing the evaluation of the first year of New York State's Mandatory Occupant Restraint Law. The results indicate that the major goals of the legislation were accomplished. Safety restraint use among front seat occupants increased from 16 percent to 57 percent after the implementation of the law. Although the usage rate declined over time, usage remained three times higher than the baseline rate. More importantly, there were substantial savings in lives and injuries among vehicle occupants involved in traffic accidents. An estimated 220 lives were saved and 3,500 serious injuries were avoided in 1985. The New York City region had lower usage rates, but greater reductions in fatalities than either the upstate or Long Island regions.

The components of the evaluation revealed additional effects of the law. There were increases in restraint use among children, even those covered by earlier child restraint legislation. Almost all drivers were aware that restraint use legislation had been passed and the majority were in favor of the law. There were more than 30,000 convictions for violations of the law in 1985, and the majority were for unbelted drivers. Although the number of convictions fluctuated very little throughout the year, the perception that the law was being strictly enforced declined over time. The fines imposed were generally $20 or less, and only five percent were $50, the maximum allowed under the law.

Recommendations are made for planning future efforts to increase usage rates and evaluate the effects of mandatory occupant restraint laws.

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EXECUTIVE SUMMARY

In the early summer of 1984, New York became the first state to enact a comprehensive Mandatory Occupant Restraint Law. Since December 1, 1984, all front seat occupants and children under the age of ten, regardless of seating position, have been required to use safety restraints. After a one-month warning period, full enforcement of the law began on January 1, 1985. A maximum fine of $50 can be imposed for a violation of the law.

This volume summarizes the major findings of a comprehensive evaluation of the impact of the law in 1985. An effective law would be expected to produce an increase in the use of safety restraints and a reduction in fatalities and serious injuries resulting from traffic accidents. The primary purpose of the evaluation was to determine whether these changes occurred. The evaluation project assessed the effects of the law on:

1) restraint use by front seat occupants and children under ten years of age;

2) behaviors, awareness, attitudes and perceptions of licensed drivers;

3) enforcement and adjudication of violations; and

4) fatalities and injuries sustained by motor vehicle occupants involved in accidents.

The primary focus of each evaluation component was the identification of the law's impact at the statewide level. The effects of the law were also examined for three regions of the State: New York City, Long Island (Suffolk and Nassau Counties), and Upstate (all other counties). When possible, the data in each evaluation component were also analyzed by the other variables of age, gender and seating position. This volume summarizes the major findings presented in the five earlier volumes in the series.

OBSERVATIONAL SURVEYS OF FRONT SEAT OCCUPANTS

Three statewide observational surveys of safety restraint use by front seat occupants were conducted. A baseline usage rate of 16 percent was measured in October 1984. In the first post-law survey in April 1985, usage in New York State rose to 57 percent. However, by September 1985 the statewide usage rate declined to 46 percent. Although there was a decrease in the usage rate, restraint use was still nearly three times the rate observed prior to the law. Large initial increases in usage, followed by decreases, occurred on both weekdays and weekends, during both rush hour and non-rush hour periods, and at night.

In each survey, the Upstate region had the highest usage rate and New York City had the lowest. The general pattern of changes in restraint use found within each region corresponded to the statewide pattern.

Based on a limited survey conducted in four selected Standard Metropolitan Statistical Areas in January 1985, it would appear that restraint use among front seat occupants was higher immediately following the law's implementation than it was in the first statewide post-law survey in April 1985.

OBSERVATIONAL SURVEYS OF CHILDREN UNDER AGE TEN

Three observational surveys were conducted at shopping centers across the State to determine the effects of the law on restraint use by children under ten years of age. A usage rate of 42 percent was measured in October 1984. After the implementation of the law, there were higher levels of restraint use among all children under the age of ten, including those under the age of seven covered by earlier child restraint legislation. The level of usage rose to 61 percent in April 1985, then declined to 57 percent in September 1985. Several factors were related to restraint use

by children. In all three surveys, the usage rate for children three years of age and under was substantially higher than the rates for the two older age groups (4-6 years, 7-9 years). After the law took effect, restraint use was higher in the front seat than in the back seat. Finally, children riding with drivers who were belted were much more likely to be restrained than children riding with unbelted drivers.

ATTITUDINAL SURVEYS OF LICENSED DRIVERS

Three statewide telephone surveys were conducted to determine the effects of the law on the behaviors, awareness, attitudes and perceptions of licensed drivers in New York State. These interviews were included as a component of the evaluation to help explain any changes in restraint use measured in the observational surveys.

There was a large increase in usage reported after the implementation of the law. Not unexpectedly, the self-reported usage rates were higher than the usage rates found in the observational surveys.

Awareness that New York State had passed a mandatory safety belt law rose from 90 percent, prior to the implementation of the law, to 99 percent in both post-law surveys. Nearly two-thirds of the drivers were in favor of the law in both the baseline survey and the first post-law survey, and support for the law increased to 71 percent in the second post-law survey. The majority of drivers from each region were also in favor of the law in all three surveys. Support for the law was stronger in the New York City and the Long Island regions than in the Upstate region.

In the first post-law survey, the drivers interviewed thought that the level of enforcement was lower than the level anticipated before the law took effect. The perception of strict enforcement continued to decline in the second post-law survey. New York City drivers were least likely to

anticipate strict enforcement of the law. In the first post-law survey, the perceived level of enforcement was lower than the level expected in all three regions, and lowest in New York City. In the second post-law survey, the perception of strict enforcement continued to decline in the Upstate and Long Island regions.

ENFORCEMENT AND ADJUDICATION OF VIOLATIONS OF THE LAW

The available information on the enforcement and adjudication of violations of the law was analyzed. In 1985, there were over 30,000 convictions for violations of the law. These convictions were distributed fairly evenly over the twelve months.

Eighty percent of the tickets resulting in a conviction were written for unbelted drivers, 14 percent were for unrestrained front seat passengers, and 16 percent were for unrestrained children under ten in the back seat. Almost all convictions resulted in a fine, and 90 percent of the fines were $25 or less. Only five percent of the fines imposed were $50, the maximum amount stipulated by the law. In 17 counties where additional data were available, the dismissal rate for safety belt tickets was 15 percent.

New York City had the lowest number of convictions per licensed driver, and Long Island had the highest number. Long Island also had the highest number of convictions per registered vehicle, while the rates in the Upstate and New York City regions were the same.

FATALITIES AND INJURIES AMONG MOTOR VEHICLE OCCUPANTS COVERED BY THE LAW

In the final component of the project, the fatalities and injuries sustained by vehicle occupants covered by the Mandatory Occupant Restraint Law were analyzed. Based on a comparison of the actual 1985 injury/fatality pattern with the pattern that would have been expected

without the law, an estimated 220 fewer persons were killed, 3,500 fewer occupants sustained serious injuries, 11,400 fewer occupants sustained moderate injuries, and 470 fewer occupants received minor injuries. The number of uninjured occupants was 15,600 higher than would have been expected. These statewide savings translated into reductions of 18 percent in fatalities, 19 percent in serious injuries, 21 percent in moderate injuries, and less than one percent in minor injuries. The increase in uninjured occupants was six percent.

The three regions of the State experienced similar savings in serious and moderate injuries. The estimated decrease in fatalities, however, was much larger in New York City (40%) than in the Upstate (11%) or the Long Island (9%) regions. The reasons for the larger savings in New York City are not clear, but some of the differences among the regions may be attributable to differences in the vehicle mix, the driver populations, the average speed, and other variables that affect the nature of crashes.

DISCUSSION AND RECOMMENDATIONS

Three major findings emerged from the comprehensive evaluation of the first-year effects of New York State's Mandatory Occupant Restraint Law:

1) Following the implementation of the law, there was a large increase in safety restraint usage among vehicle occupants covered by the law.

2) The observed usage rates declined over time, but remained much higher than the baseline rates.

3) Substantial savings in fatalities and serious injuries among occupants covered by the law occurred during the first year of the law's implementation.

These results indicate that the major goals of the legislation were accomplished.

While the law clearly resulted in substantial highway safety benefits, this early study of New York's experience could not provide all the answers regarding how the results were achieved and how the benefits from the law can be increased in the future. Additional questions concerning the relationships among restraint use, drivers' attitudes and perceptions, enforcement, and traffic fatalities and injuries emerged from the evaluation. New York and other states should consider the recommendations of this report in planning future efforts to increase usage rates and evaluate the effects of mandatory occupant restraint laws.

RECOMMENDATIONS

- Identify characteristics of the vehicle occupants who do not obey the law and the reasons for noncompliance for use in the development of programs to increase and sustain high usage levels.
- Monitor the content and scope of any public information and education campaigns and assess the effects on usage rates.
- Increase the actual and perceived risk of enforcement and monitor the effects on compliance.
- Determine the extent of primary versus secondary enforcement and how police attitudes affect both primary and secondary enforcement of the law.
- Examine the effect increased penalties would have on usage rates.
- Identify judicial attitudes and adjudication practices and determine whether these affect the levels of enforcement and compliance.
- Analyze the relationship between safety belt use and the driver, vehicle, and environmental characteristics of accidents resulting in fatalities and serious injuries.
- Investigate other sources of reliable restraint use and injury data for accident victims.
- Monitor changes in specific categories of injuries that are likely to be affected by increased restraint use.
- Continue to collect and analyze post-law data to determine the long-term effects of the law.

1. INTRODUCTION

For many years New York State has been a leader in promoting the use of safety restraints as an important measure for improving highway safety. In working toward the goal of restraint use by all vehicle occupants, traffic safety proponents in New York State adopted an incremental approach.

In the early 1960s, prior to the 1966 federal mandate, New York required that all new automobiles sold in the State be equipped with safety belts. In 1982, a principal recommendation of the Governor's Task Force on Alcohol and Highway Safety was the implementation of mandatory occupant restraint legislation. Mandated safety restraint use was cited as the most cost-effective means of protecting all vehicle occupants involved in traffic accidents.

In April 1982, New York State implemented one of the strictest child restraint laws in the nation. Since that time, restraint use has been required for all children under the age of five. Children under four years of age must be restrained in federally-approved child restraint devices. The law allows for the substitution of safety belts for children between the ages of four and five. In April 1984, New York State enacted legislation that extended mandatory restraint use to children up to the age of seven and provided that the requirement be extended by 1987 to all children under ten years of age.

In the early 1980s, New York State also began to require mandatory restraint use by certain categories of drivers. In March 1983, drivers with learner permits were required by the Commissioner of Motor Vehicles to use safety restraints. Early in the 1984 legislative session, a law was passed that required drivers with probationary licenses to buckle up, beginning in September 1984.

In the early summer of 1984, this incremental approach culminated with New York becoming the first state to enact a comprehensive mandatory occupant restraint law covering adults and children. Since December 1, 1984, all front seat occupants and children under the age of ten, regardless of seating position, have been required to use safety restraints. Occupants of trucks weighing over 18,000 pounds, emergency vehicles, taxis, buses, and vehicles that pre-date the safety belt installation requirement are exempted. After a one-month warning period, full enforcement of the law began on January 1, 1985. Primary enforcement of the law is allowed; that is, persons not restrained can be stopped and ticketed, even if no other violation of the law is evident. The penalty for violating the law is a maximum fine of fifty dollars. No minimum fine is stipulated by the law, and persons convicted for noncompliance do not receive penalty points on their driver's licenses.

EVALUATION OF NEW YORK STATE'S MANDATORY OCCUPANT RESTRAINT LAW

Officials in both New York State and the federal government recognized the importance of New York's passage of the first general mandatory occupant restraint law in the United States and the need to conduct a careful and rigorous assessment of the impact of the law on the driving public. The mutual concern for a comprehensive evaluation of the law during its first year led to the development of an evaluation plan with several components.

The purpose of the evaluation project was to assess 1) the immediate effects of the law on the use of occupant restraints by front seat occupants and children under ten years of age, and 2) the ultimate effects of the law on fatalities and serious injuries among accident victims. It was also decided that interviewing licensed drivers to measure reported

behaviors, awareness, attitudes and perceptions would contribute to an understanding of the behavior observed on the roadways. Finally, information on the level of enforcement that was occurring, the characteristics of persons violating the law, and the nature of the penalties being imposed would be derived through an analysis of the available data on tickets and convictions.

The Institute for Traffic Safety Management and Research, under subcontract to the New York State Governor's Traffic Safety Committee, cooperated with officials of the National Highway Traffic Safety Administration to develop the evaluation design for this project and was responsible for the implementation and completion of all project components.

This is Volume VI in a series of reports from the two-year project entitled "Evaluation of New York State's Mandatory Occupant Restraint Law" (DTNH22-84-C-07467). The first five volumes of the series are final reports on the individual components of the evaluation study:

Volume I - Observational Surveys of Safety Restraint Use in New York State, December 1985

Volume II - Attitudinal Surveys of Licensed Drivers in New York State, December 1985

Volume III - Observational Surveys of Safety Restraint Use by Children in New York State, February 1986

Volume IV - Enforcement and Adjudication of 1985 Violations of the Mandatory Occupant Restraint Law in New York State, January 1987

Volume V - Fatalities and Injuries Among Motor Vehicle Occupants Covered by the Law, February 1987

This sixth volume summarizes and integrates the major findings from the five evaluation components and offers conclusions about the effects of New York State's Mandatory Occupant Restraint Law in 1985.

Chapters 3-6 discuss the methodology and results of the five evaluation components. The primary focus of each evaluation component was to identify the impact of the law at the statewide level. The effects of the law were then examined on a regional basis. The 62 counties of the State were grouped into three regions. (Figure 1.1) New York City comprised one region and included the highly urbanized counties of the Bronx, Kings (the Borough of Brooklyn), New York (the Borough of Manhattan), Queens, and Richmond (the Borough of Staten Island).[1] A second region, "Long Island," was composed of Nassau and Suffolk Counties. These two heavily populated counties, located on Long Island, New York, differ in many respects from New York City and the rest of the State. The remaining 55 counties in the State formed the third "Upstate" region. When possible, the data in each evaluation component were also analyzed by the other variables of age, gender, and seating position.

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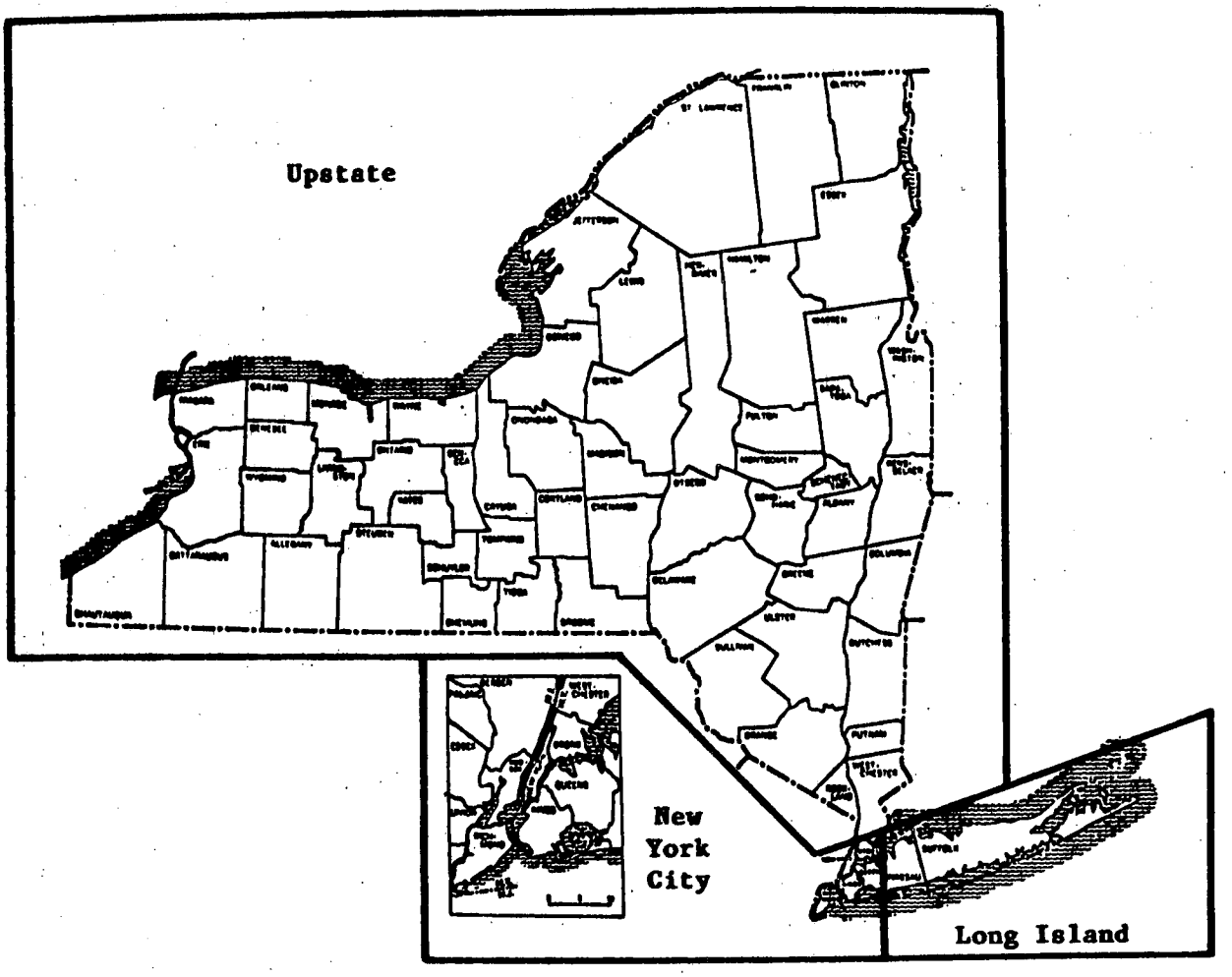
[1] The New York City region also included Putnam, Rockland and Westchester Counties in the observational surveys of front seat occupants and the observational surveys of restraint use by children.

FIGURE 1.1

REGIONS OF NEW YORK STATE



2. OBSERVATIONAL SURVEYS OF SAFETY RESTRAINT USE BY FRONT SEAT OCCUPANTS

A key element of the evaluation was obtaining estimates of statewide and regional restraint use that were representative of the New York State driving population. Three statewide observational surveys of front seat occupants were conducted.

METHODOLOGY

A sampling design for these surveys was developed by Westat, Inc., of Rockville, Maryland, under a separate contract with the National Highway Traffic Safety Administration. A probability sample of 700 observation sites was selected from the State's 12 Standard Metropolitan Statistical Areas (SMSAs) and four counties representing the 28 counties not included in an SMSA. High, middle and low traffic volume roads were included in the sample. The direction and the lane of traffic observed at each location were randomly selected.

Observations at the selected sites were scheduled between 8:00 a.m. and 5:00 p.m. on all days of the week. Each observation period was one hour and only the front seat occupants' restraint use was recorded. Sites were not limited to controlled intersections. At the sites where traffic did not stop, only shoulder belt use was observed. At sites where traffic stopped, it was also possible to observe the use of lap belts. These data were used to estimate the rate of lap belt use in moving traffic. Adjustments were also made for traffic volume, using the number of lanes on each road.[1]

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[1] J. Michael Brick and John Edmonds, Design of the New York State Seat Belt Usage Survey: Final Report (Washington, DC: U.S. Department of Transportation National Highway Traffic Safety Administration, November 1984).

Three statewide observational surveys of restraint use were conducted. The baseline survey occurred in October 1984, the first post-law survey was in April 1985, and the second post-law survey was in September 1985. In addition, to obtain a measure of the immediate effect of the law on safety belt usage, a smaller survey was conducted in January 1985 in four of the SMSAs of New York State. For each survey, observations were scheduled on the same day of the week and at the same time of the day, whenever possible. More than 200,000 observations were recorded in each statewide survey.

In addition to daytime observations of belt use, three surveys of restraint use at night were conducted. The purpose of these surveys was to test the feasibility of collecting nighttime restraint use data and to determine whether the Mandatory Occupant Restraint Law had a different effect upon persons travelling after dark. The individual observers chose locations from among their assigned daytime sites that had adequate lighting and that they considered safe. Only shoulder belt use was observed at night.

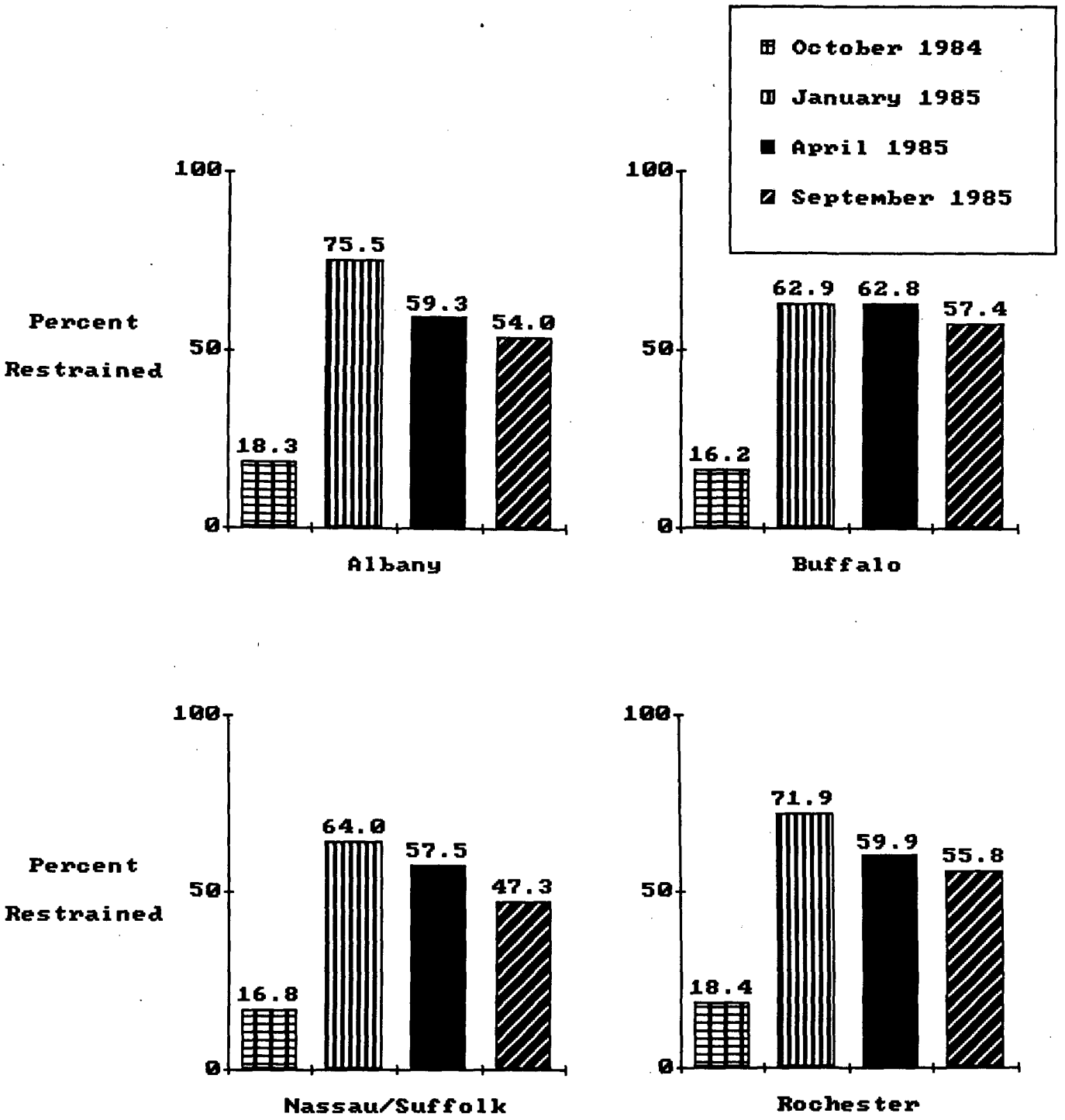
STATEWIDE RESULTS

The results of the three statewide surveys of safety restraint use by front seat occupants appear in Figure 2.1. A baseline usage rate of 16 percent was measured in October 1984. In the first post-law survey in April 1985, usage in the State had increased to 57 percent. However, by September 1985 the statewide usage rate had declined to 46 percent. Although this represented a substantial decrease from the April 1985 usage rate, restraint use was still nearly three times the rate observed prior to the law.

Furthermore, there were large initial increases in usage followed by decreases on both weekdays and weekends and during both rush hour and non-rush hour periods. In each survey, statewide usage in rush hour traffic (8:00 am-9:00 am; 4:00 pm-5:00 pm) was two to three percentage points higher than usage during other hours of the day (9:00 am-4:00 pm). Additional observations conducted from 7:00-8:00 pm and from 8:30-9:30 pm indicated that restraint use at night followed the same pattern over time. While nighttime rates were generally lower than those during the day, the differences between day and night usage rates were less than five percentage points in all three surveys.

FIGURE 2.2

CHANGES IN USAGE RATES
IN FOUR SELECTED AREAS



REGIONAL RESULTS

The general pattern of changes in restraint use found within each region corresponded to the statewide pattern. (Figure 2.1) In October 1984, 19 percent of the front seat occupants observed Upstate were restrained, compared to 17 percent on Long Island and 14 percent in New York City. When the first statewide post-law survey was conducted in April 1985, increases in usage of 41 to 42 percentage points were noted in all three regions. Subsequent decreases in restraint use were found in all three regions in the second post-law survey, but the size of the decreases varied by region. The smallest decline occurred in the Upstate region, where the usage rate dropped by seven percentage points to 53 percent. The usage rate on Long Island was 47 percent, 11 percentage points lower than that measured in the first post-law survey. Usage in New York City dropped from 56 percent in April 1985 to 40 percent in September 1985.

JANUARY 1985 SURVEY

The four Standard Metropolitan Statistical Areas surveyed in January 1985 were Albany, Buffalo, Nassau-Suffolk and Rochester. (Figure 2.2) With the exception of Buffalo, where no decline was noted between January 1985 and April 1985, restraint use in January was higher than at any other time. Since the changes in usage in these four areas in April 1985 and September 1985 were consistent with the changes statewide, it is very likely that the statewide and regional usage rates in January 1985 were also higher than those measured in April 1985.

3. OBSERVATIONAL SURVEYS OF CHILDREN UNDER AGE TEN

DISCUSSION

Two major findings emerged from the series of observational surveys of safety restraint use conducted in New York State between October 1984 and September 1985. First, with the implementation of the Mandatory Occupant Restraint Law, there was a substantial increase in safety restraint use in New York State. Second, the large increase in usage which occurred immediately after the law took effect was not sustained over time.

Differences between weekend and weekday usage rates or between rush hour and non-rush hour usage rates did not appear to be important factors in explaining the decline in usage over time. Usage varied more among the three regions of the State. In all three surveys, the highest usage was measured in the Upstate region and the lowest in New York City. While similar increases in usage occurred in all three regions in the first post-law survey, the subsequent decrease in the statewide rate to below 50 percent was primarily attributable to the New York City and Long Island regions. The reasons for these regional differences in restraint use were not apparent.

3. OBSERVATIONAL SURVEYS OF CHILDREN UNDER AGE TEN

The evaluation project also included a series of three observational surveys of restraint use by children under ten years of age. These surveys were conducted to determine whether the implementation of the Mandatory Occupant Restraint Law affected the level of restraint use for children under ten and to identify factors which may influence restraint usage among children.

METHODOLOGY

Children's restraint use was observed at shopping centers across the State. The survey methodology and data collection procedures were patterned after a study conducted in Ontario, Canada.[1] Since restraint use was already required for children under the age of seven at the time of the October 1984 baseline survey, it was important to have accurate age information for the children observed. In order to achieve this, an observer was positioned on the center median of a controlled exit so that contact with the drivers of the vehicles leaving the shopping center was possible. All passenger vehicles stopped for the red light in the lane nearest the observer were scanned, and the vehicles that appeared to contain children under the age of ten were approached. The observer informed the driver that a traffic safety study was in progress and asked for the ages of the children in the vehicle. If the driver was willing to participate in the study, the observer recorded the age, restraint use and seating position of each child, and the gender and restraint use of the driver.

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[1] Brian A. Jonah and Pamela Brett, Development and Evaluation of a Methodology for Measuring Child Restraint Use (Ottawa: Road Safety Directorate, Transport Canada, July 1984).

Unlike the observation sites used in the surveys of front seat occupants, the sites for the surveys of children under ten could not be randomly selected. Therefore, it cannot be assumed that the samples obtained in the shopping center surveys were representative of the total population of children under ten in the State. However, the findings indicated how children's restraint use was affected by the law's implementation.

STATEWIDE RESULTS

A usage rate of 42 percent was measured in October 1984. After the implementation of the Mandatory Occupant Restraint Law, there were higher levels of restraint use among all children under ten years of age, including those covered by earlier legislation. The level of usage rose to 61 percent in April 1985, then declined to 57 percent in September 1985.

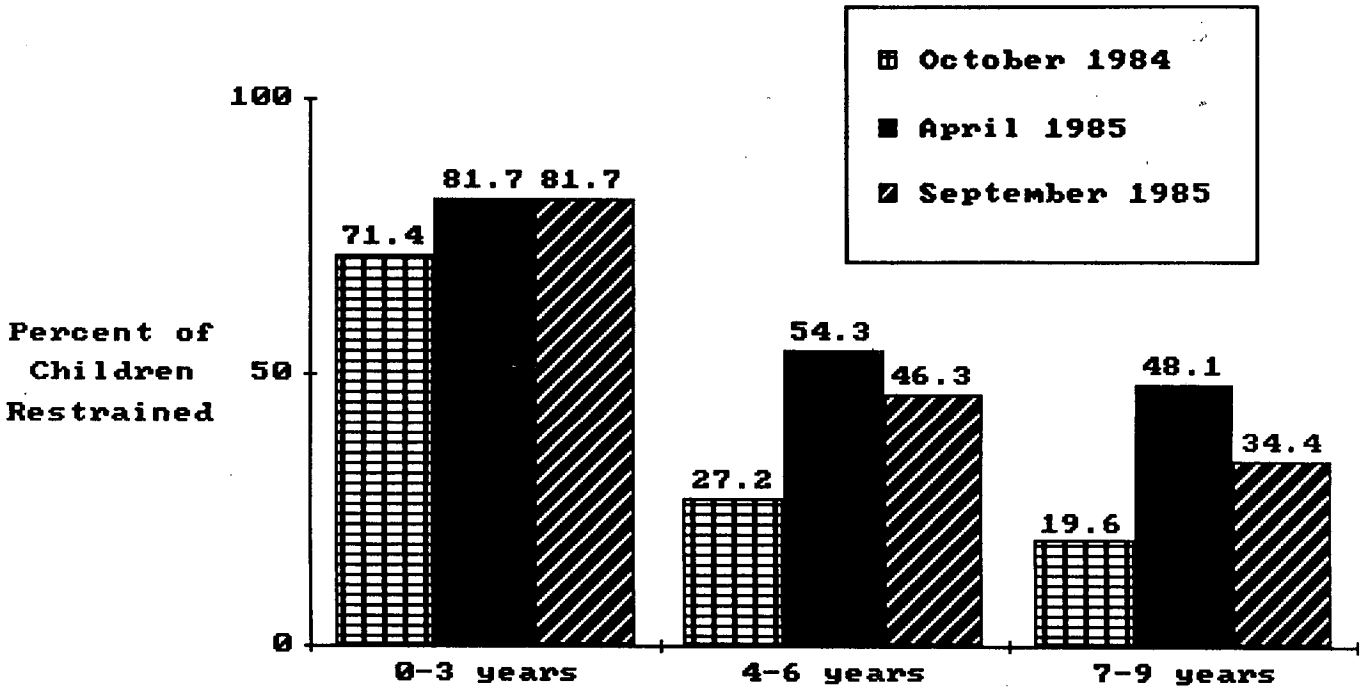
Age

A clear and consistent inverse relationship between the age of the child and restraint use was identified. (Figure 3.1) In each survey, the usage rates for children three years of age and under was substantially higher than the usage rates for the older age groups (4-6 years, 7-9 years). This pattern was evident even in the baseline survey, when children four to six years of age, as well as those in the youngest age group, were covered by restraint use legislation. These apparent differences in restraint use among the age groups may have been due to a lack of awareness that mandatory use had been extended to children up to seven years of age in 1984, and further extended to children up to ten years of age under the new law. An alternative explanation, however, is that age is an important factor in restraint use, even with mandatory use

legislation covering all ages of children. In fact, in both post-law surveys, when legislation covered all children under ten, restraint use continued to be inversely related to age.

FIGURE 3.1

RESTRAINT USE OF CHILDREN
IN THREE AGE GROUPS



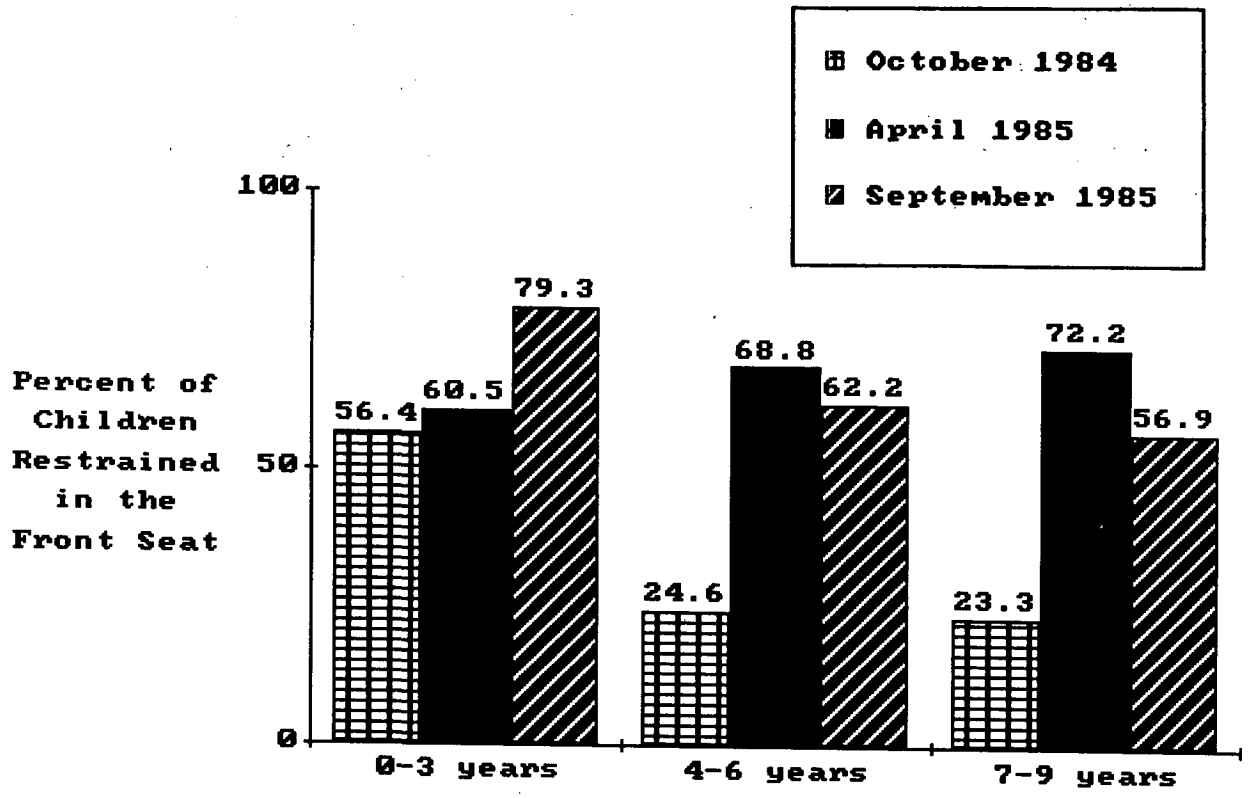
Seating Position

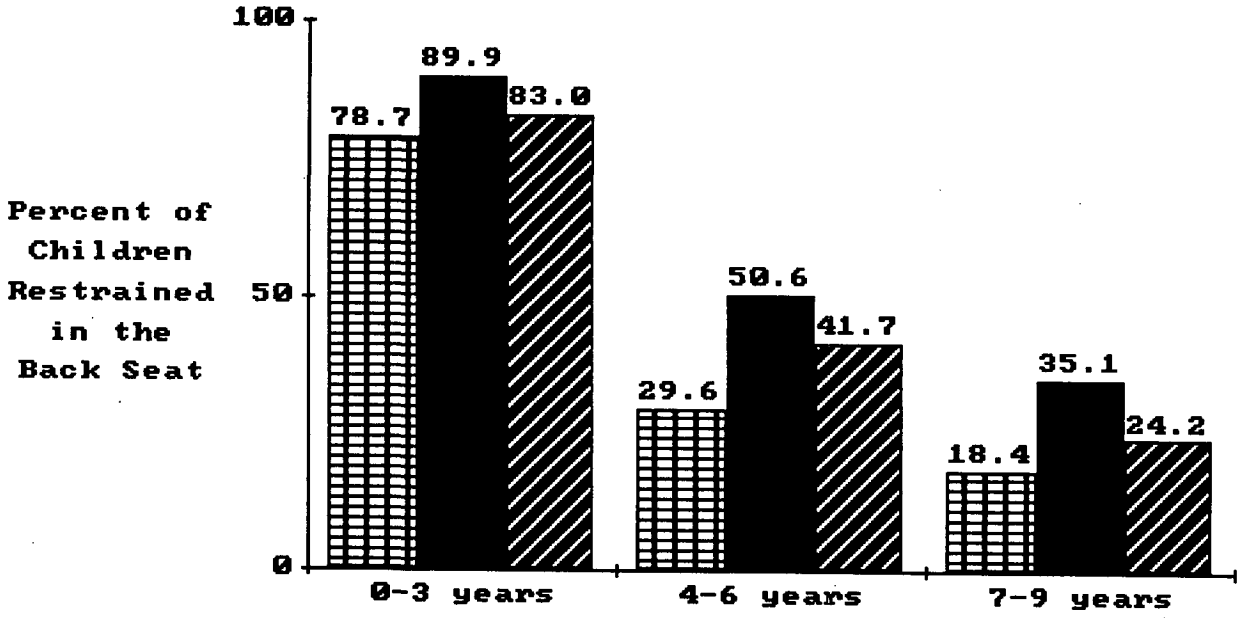
Children's restraint use also differed by seating position. (Figure 3.2) Before the Mandatory Occupant Restraint Law, restraint use was higher in the back seat (46%) than in the front seat (36%). However, after implementation of the law, usage was higher in the front seat (68% in both April and September 1985) than in the back seat (61% in April 1985 and 53% in September 1985).

Although the restraint use of children in both seating positions was higher in the April 1985 survey than in the baseline survey, the difference between front and back seat usage was a result of the large increases that occurred among children in the two older age groups riding in the front seat. Since comparable increases in restraint use did not occur among older children riding in the back seat, it is likely that front seat use was higher because the Mandatory Occupant Restraint Law requires restraint use for all front seat occupants, regardless of age.

FIGURE 3.2

RESTRAINT USE AND SEATING POSITION
OF CHILDREN IN THREE AGE GROUPS





Relationship To Restraint Use of Drivers

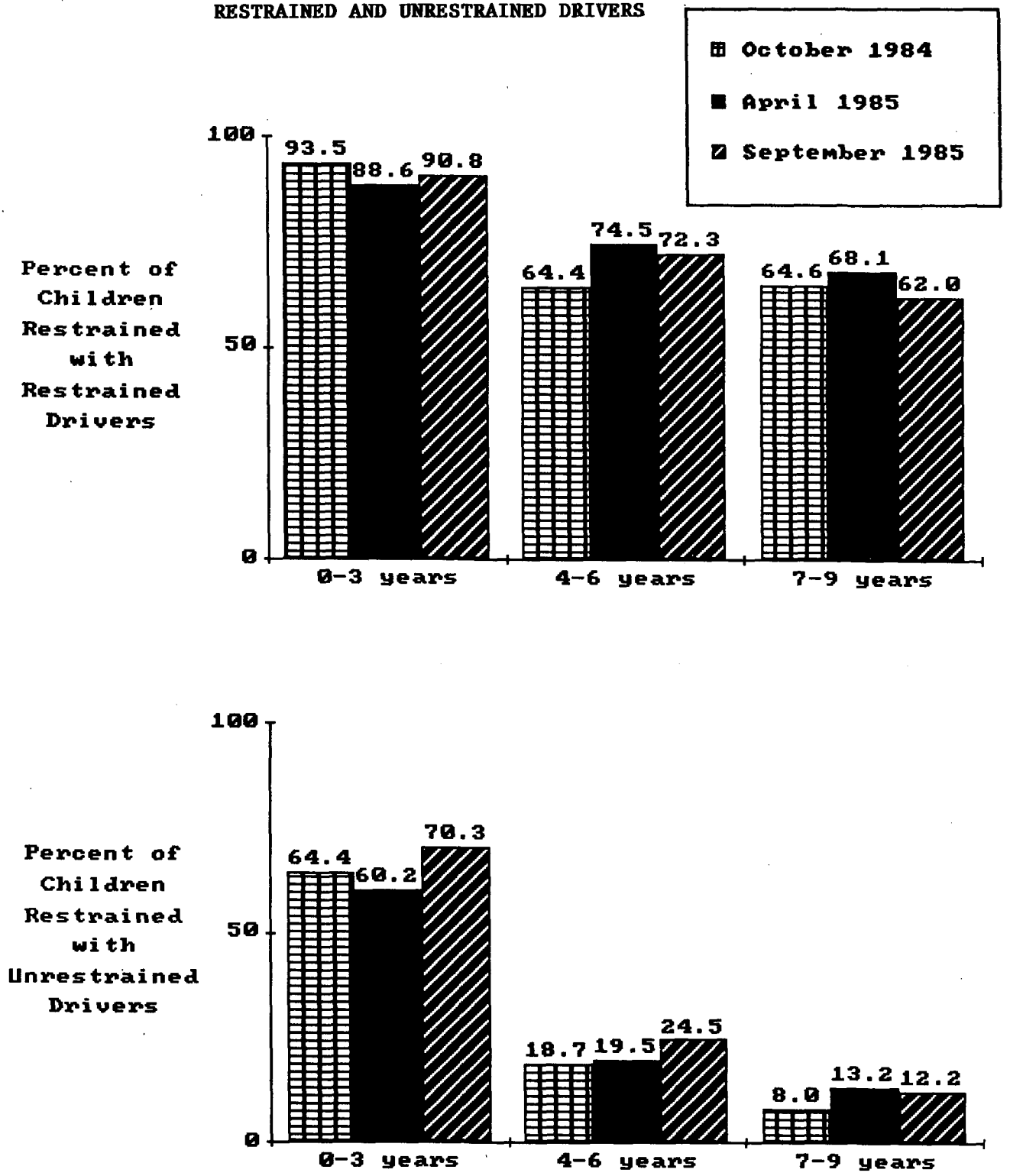
When the restraint use of the drivers was compared to the restraint use of the children in their vehicles, a consistent relationship was found in all three surveys, despite the fact that the observed level of restraint use among drivers differed in each survey (21% in October 1984, 68% in April 1985 and 51% in September 1985). The proportion of children who were restrained with drivers who were also restrained was approximately 78 percent in all three surveys, while the proportion of restrained children with unrestrained drivers ranged from 28 percent to 37 percent.

As Figure 3.3 indicates, children of all age groups riding with drivers who were belted were much more likely to be restrained than children riding with unbelted drivers. Children in the youngest age group riding with belted drivers consistently had the highest restraint use. However, over 60 percent of the older children were also restrained while riding with drivers who were buckled up.

For children riding with unrestrained drivers, there were large differences in usage among the three age groups. Although usage rates of at least 60 percent were measured among children three years of age and under in each survey, less than one-quarter of the children four to six years of age were restrained when the drivers were unbelted. Safety belt use was even lower among the oldest children riding with unrestrained drivers. Thirteen percent was the highest usage rate measured for this age group.

FIGURE 3.3

RESTRAINT USE OF CHILDREN IN THREE AGE GROUPS RIDING WITH RESTRAINED AND UNRESTRAINED DRIVERS



REGIONAL RESULTS

Within all three regions there were large increases in usage among children under ten after implementation of the Mandatory Occupant Restraint Law. (Table 3.1) The changes in restraint use in the second post-law survey, however, were not consistent across the regions. Usage declined in the Long Island and New York City regions but increased in the Upstate region. The greatest changes over time occurred in the Long Island region where restraint use dropped nearly 20 percentage points in September 1985.

TABLE 3.1

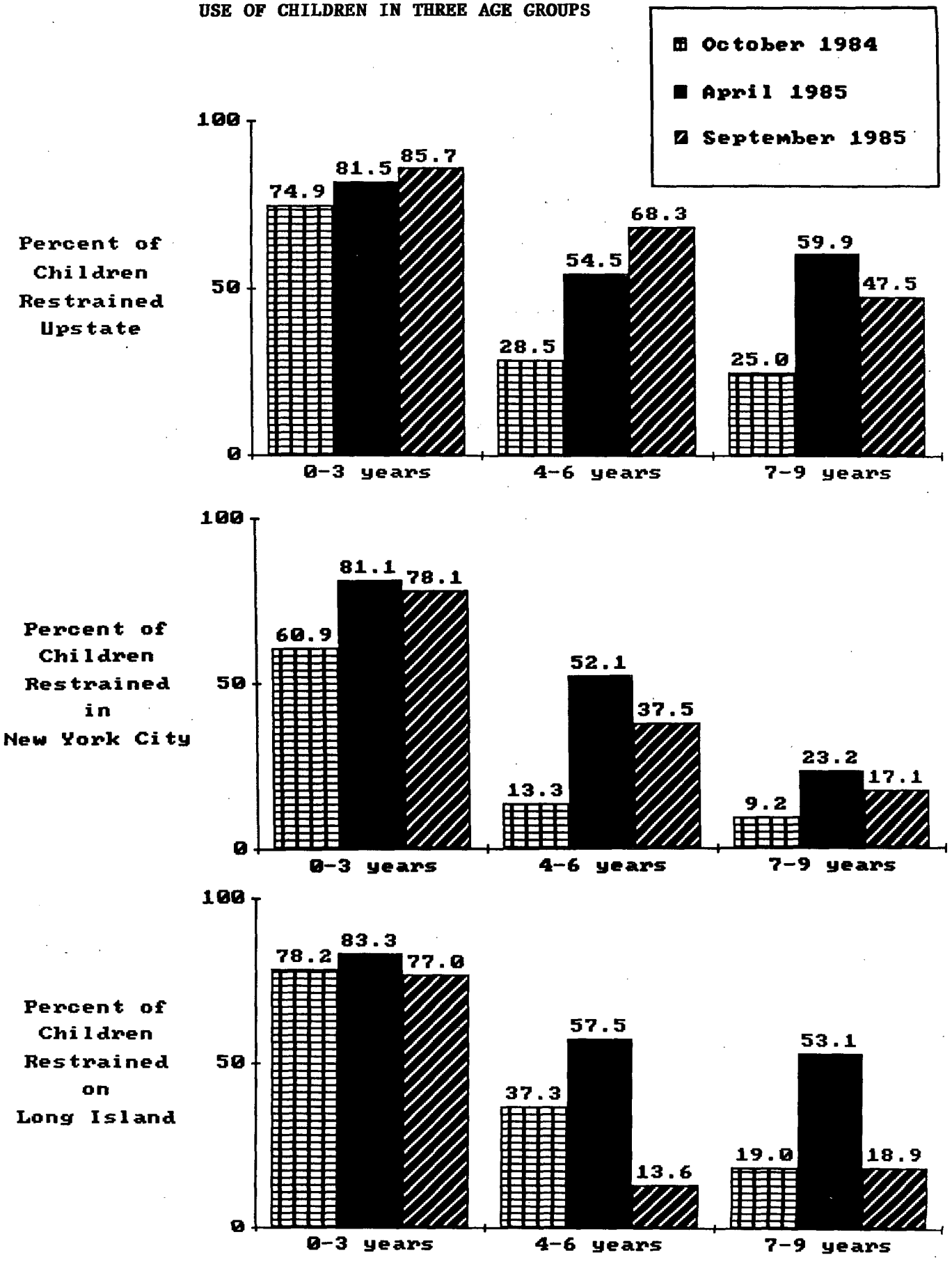
REGIONAL DIFFERENCES IN RESTRAINT USE BY CHILDREN

REGION	Baseline Oct.1984 %	First Post-Law Apr.1985 %	Second Post-Law Sept.1985 %
Upstate	43.6	65.7	69.3
New York City	33.7	50.1	46.2
Long Island	50.0	64.3	45.0

Analyses were also conducted to identify any regional differences in restraint use among the three age groups of children. In all three regions of the State, children's restraint use for all age groups was higher in April 1985 than in the October 1984 baseline survey. (Figure 3.4) In each region, restraint use was highest among the youngest age group of children and varied the least over time. In the second post-law survey, very low usage rates for children in the oldest age group in the Long Island and New York City regions contributed most to the drop in usage over time.

FIGURE 3.4

REGIONAL DIFFERENCES IN RESTRAINT USE OF CHILDREN IN THREE AGE GROUPS



DISCUSSION

Following the implementation of the Mandatory Occupant Restraint Law, there was a large increase in children's use of safety restraints. This was true even among children under the age of seven who were covered by earlier restraint use legislation. Several variables were found to be related to children's restraint use.

Restraint use was inversely related to the age of the child, even in the surveys conducted after the extension of mandatory use to all children under the age of ten.

Seating position was also an important factor. The law had a greater impact on restraint use among children in the front seat than in the back seat, especially children in the two older age groups. It appears that the extension of restraint use to all front seat occupants, regardless of age, was the critical factor in the increase in restraint use among children in the front seat. A second contributing factor may have been a lack of awareness that restraint use is also required for children riding in the back seat.

Another important variable was region. In general, usage was highest in the Upstate region and lowest in New York City. The greatest changes over time, however, occurred in the Long Island region where the restraint use of children in the two older age groups and the usage rate of drivers dropped dramatically in September 1985.

Finally, the restraint use of drivers was an important factor in children's restraint use. Children riding with drivers who were buckled up were much more likely to be restrained. Because of this strong relationship, the decline in usage among drivers adversely affected usage among children, especially those over three years of age.

4. ATTITUDINAL SURVEYS OF LICENSED DRIVERS

In addition to observational surveys of restraint use among vehicle occupants covered by the law, three statewide telephone surveys were conducted to determine the effects of the law on the behaviors, awareness, attitudes and perceptions of licensed drivers in New York State. These interviews with licensed drivers were included as a component of the evaluation to help explain any changes in restraint use measured in the observational surveys.

METHODOLOGY

A sample of one thousand New York State drivers was contacted in each survey. The number of licensed drivers interviewed from each county was based on the proportion of the State's licensed drivers residing in that county. Random-digit dialing was used so that all households with telephones, including those with unlisted and newly listed numbers, had an equal probability of being selected. The sampling plan provided for the random selection of the person interviewed from among all the licensed drivers residing in each household contacted.

BEHAVIORS

As Table 4.1 indicates, reported usage was much higher after the implementation of the Mandatory Occupant Restraint Law. Two-thirds of the drivers in March 1985 said they always wear safety belts, compared to 29 percent in October 1984. Although there were slightly fewer drivers in September 1985 than in March 1985 reporting they always wear safety belts, the proportion reporting that they never buckle up was the same in both post-law surveys. Not unexpectedly, the self-reported levels of usage were higher than the observed usage rates reported in Chapter 2.

TABLE 4.1

REPORTED FREQUENCY OF SAFETY RESTRAINT USE BY DRIVERS

In general, do you wear a safety belt...	Baseline Oct.1984 %	First Post-Law Mar.1985 %	Second Post-Law Sept.1985 %
Always	29.0	66.9	62.5
Most of the time	16.6	17.3	19.0
Sometimes	22.4	9.6	12.1
Never	32.0	6.2	6.4

Based on the reasons given for buckling up, it appears that the implementation of the law was responsible for the large increase in usage that was reported in the first post-law survey. (Table 4.2) In the second post-law survey, fewer drivers said they buckle up because of the law. In both the baseline survey and the second post-law survey, safety was the reason given most often for using safety belts.

TABLE 4.2

REASONS FOR FREQUENCY OF RESTRAINT USE

Reasons why drivers use safety belts always or most of the time	Baseline Oct.1984 (N=455) %	First Post-Law Mar.1985 (N=842) %	Second Post-Law Sept.1985 (N=815) %
Mandatory safety belt law	4.9	49.7	36.4
Safety	66.1	38.7	52.1
Habit	16.5	5.6	6.4
Other	12.5	6.0	5.1
Reasons why drivers use safety belts only some of the time	**(N=244) %**	**(N=95) %**	**(N=121) %**
Never formed habit, forget	35.8	40.8	30.2
Too much trouble	19.7	19.4	26.9
Too confining, uncomfortable	9.2	17.1	15.1
Opposed to law	0.0	6.5	4.2
Wear only on long trips	16.1	5.4	7.6
Other	19.2	10.8	16.0
Reasons why drivers never use safety belts	**(N=319) %**	**(N=62) %**	**(N=64) %**
Too confining, uncomfortable	32.8	32.8	38.5
Never formed habit, forget	28.0	20.7	16.9
Too much trouble	18.3	10.3	13.8
Opposed to law	4.2	19.0	6.2
Other	16.7	17.2	24.6

Drivers who were parents of children under the age of ten were asked about their children's use of safety restraints. (Table 4.3) Although the increase in reported usage was largest for children 7-9 years of age, higher levels of compliance were also reported for the younger children covered by earlier legislation.

TABLE 4.3

REPORTED FREQUENCY OF SAFETY RESTRAINT USE
BY CHILDREN IN THREE AGE GROUPS

	Baseline Oct.1984 (N=133)	First Post-Law Mar.1985 (N=146)	Second Post-Law Sept.1985 (N=142)
0-3 YEARS	%	%	%
Always	94.0	93.2	95.8
Most of the time	0.0	5.5	2.8
Sometimes	1.5	0.0	1.4
Never	4.5	1.3	0.0
	(N=115)	(N=117)	(N=119)
4-6 YEARS	%	%	%
Always	73.0	84.6	79.8
Most of the time	8.7	9.4	16.9
Sometimes	7.0	3.4	2.5
Never	11.3	2.6	0.8
	(N=105)	(N=121)	(N=119)
7-9 YEARS	%	%	%
Always	52.4	74.4	73.9
Most of the time	11.4	8.3	17.7
Sometimes	22.9	12.3	6.7
Never	13.3	5.0	1.7

AWARENESS

Ninety percent of the drivers contacted prior to the implementation of the law were aware that New York State had passed a Mandatory Occupant Restraint Law. (Table 4.4) In the two post-law surveys, 99 percent of the drivers interviewed were aware of the law. Most of the drivers had heard about the law through the news media.

A large proportion of the drivers in both post-law surveys believed the fine for not buckling up was $50 (72% in March 1985 and 66% in September 1985). Four percent of the drivers were aware that the fine could range up to $50.

TABLE 4.4

AWARENESS OF MANDATORY OCCUPANT RESTRAINT LAW

Are you aware that New York State has passed a law requiring all drivers, front seat passengers and children under ten to use safety restraints?	Baseline Oct.1984 %	First Post-Law Mar.1985 %	Second Post-Law Sept.1985 %
Yes	89.5	99.4	99.4
No	10.5	0.6	0.6
Can you tell me what the penalty is for not complying with the law?			
Fine of up to $50	5.7	3.5	3.6
$50 fine	31.6	71.9	65.6
Fine	18.1	10.9	11.8
Other	7.3	3.8	3.9
Don't know	37.3	9.9	15.1

ATTITUDES

The majority of licensed drivers in New York State were consistently supportive of the safety belt law. Support for the law rose from 64 percent in the baseline period to 71 percent in September 1985. (Table 4.5) The prevention of deaths and injuries was most often cited as the reason for favoring the law.

TABLE 4.5

ATTITUDES TOWARD MANDATORY OCCUPANT RESTRAINT LAW

How do you feel about this law? Are you....	Baseline Oct.1984 %	First Post-Law Mar.1985 %	Second Post-Law Sept.1985 %
Very much in favor	40.8	41.1	49.1
Somewhat in favor	22.8	23.6	21.6
Undecided	11.6	10.6	10.7
Somewhat against	10.8	10.9	9.2
Very much against	14.0	13.8	9.4

The majority of drivers from each region were in favor of the law in all surveys. (Table 4.6) Support for the law was stronger in the New York City and the Long Island regions than in the Upstate region.

TABLE 4.6

DRIVERS IN FAVOR OF
MANDATORY OCCUPANT RESTRAINT LAW

	Baseline Oct.1984 %	First Post-Law Mar.1985 %	Second Post-Law Sept.1985 %
Upstate	57.0	58.7	64.8
New York City	71.9	73.9	77.9
Long Island	70.9	68.7	77.1

PERCEPTIONS

Drivers' perceptions of enforcement efforts related to the safety belt law were also assessed. (Table 4.7) Prior to the law's implementation, licensed drivers were asked how strict they thought enforcement would be. Forty percent said the law would be very strictly or somewhat strictly enforced. The drivers contacted in the post-law surveys were asked how

strictly they thought the law was actually being enforced. Only 27 percent of those contacted in March 1985 thought the law was being strictly enforced. By September 1985, this percentage had fallen to 23 percent.

TABLE 4.7

PERCEPTIONS OF ENFORCEMENT
OF MANDATORY OCCUPANT RESTRAINT LAW

How strictly do you think the law will be/is being enforced?	Baseline Oct.1984 %	First Post-Law Mar.1985 %	Second Post-Law Sept.1985 %
Very strictly	14.6	6.3	3.3
Somewhat strictly	25.2	20.8	19.8
Not sure	26.2	36.0	34.6
Not very strictly	27.1	31.0	30.8
Not enforced at all	6.9	5.9	11.5

In the baseline survey, New York City drivers were least likely to anticipate strict enforcement of the law. (Table 4.8) In the first post-law survey, the perceived level of enforcement was lower than the level anticipated in all three regions, and lowest in New York City. In the second post-law survey, the perception of strict enforcement continued to decline in the Upstate and the Long Island regions. However, in New York City there was a small increase in the proportion of drivers who thought the law was being strictly enforced. As a result, the perception of strict enforcement was similar in all three regions in September 1985.

TABLE 4.8

DRIVERS PERCEIVING STRICT ENFORCEMENT
OF MANDATORY OCCUPANT RESTRAINT LAW

	Baseline Oct.1984 %	First Post-Law Mar.1985 %	Second Post-Law Sept.1985 %
Upstate	43.3	28.4	23.7
New York City	33.7	21.6	23.6
Long Island	38.3	31.3	20.9

DISCUSSION

The results of the telephone surveys help explain the changes in observed restraint use. The surveys indicated that the initial increase in observed restraint use was a result of the implementation of the law, while the decline in usage over time was related to a low perceived threat of enforcement.

The changes in usage do not seem to be related to changes in the level of support for the law. The decline in usage during 1985 occurred at the same time that support for the law increased. There was also no correlation between attitudes toward the law and regional usage rates. The level of support for the law was higher in the Long Island and New York City regions, but the Upstate region consistently had the highest usage rates.

5. ENFORCEMENT AND ADJUDICATION OF VIOLATIONS OF THE LAW

Another component of the evaluation was the analysis of the available information on the enforcement and adjudication of 1985 violations of the Mandatory Occupant Restraint Law.

CONVICTIONS

On a statewide basis, data were only available for those violations that resulted in conviction. Conviction information for violations that occurred during the first year of the law was obtained from the New York State Department of Motor Vehicles' driver's license file. This information included the specific provision of the law that was violated, when and where the violation occurred, the penalty imposed, and the gender and age of the person convicted. Tickets not resulting in conviction are not entered on the driver's license file.

In 1985, there were over 30,000 convictions for violations of the law. This was equivalent to approximately three convictions for every 1,000 licensed drivers in the State. The total convictions in 1985 were distributed fairly evenly across the twelve months.

Table 5.1 shows the proportion of convictions that occurred in each region of the State. The majority of convictions were in the Upstate region (57%). Approximately one-fifth of the convictions occurred in New York City, and one-quarter took place on Long Island. The number of convictions per 1,000 licensed drivers was highest in the Long Island region and lowest in New York City. Differences among the regions in driving habits, vehicle miles travelled and enforcement practices may account for some of the variation in these conviction rates. Although the regional rates were more consistent when based on the number of convictions per 1,000 registered vehicles, the highest rate was still found in the Long Island region.

TABLE 5.1

1985 STATEWIDE AND REGIONAL SAFETY BELT CONVICTIONS

	Convictions (N=30243) %	Number of Convictions Per 1,000 Licensed Drivers*	Number of Convictions Per 1,000 Registered Vehicles**
Upstate	56.9	3.3	3.4
New York City	19.1	2.2	3.4
Long Island	24.0	3.8	3.8
STATEWIDE	100.0	3.1	3.5

*Based on the number of licensed drivers in 1985, NYS Department of Motor Vehicles.

**Based on the number of registered passenger vehicles and an estimate of the number of registered commercial vehicles covered by the law, NYS Department of Motor Vehicles, 1985.

Information on the specific provision of the law that was violated was available for 68 percent of the convictions statewide. Eighty percent of these convictions were for unbelted drivers, 14 percent were for unrestrained front seat passengers, and six percent were for unrestrained children under ten in the back seat. (Table 5.2) On a regional basis, the proportion of convictions for unbelted drivers ranged from 77 percent in the Upstate region to 92 percent in New York City. The largest number of convictions for unrestrained children was in the Upstate region.

TABLE 5.2

1985 STATEWIDE AND REGIONAL SAFETY BELT CONVICTIONS BY TYPE OF VIOLATION*

	Statewide (N=20177) %	Upstate (N=12388) %	New York City (N=3918) %	Long Island (N=3871) %
Driver	80.3	76.6	91.5	81.1
Front Seat Passenger Age 16 and Older	8.2	9.2	4.4	8.9
Front Seat Passenger Age 0-15	5.3	6.7	1.9	4.0
Back Seat Passenger Age 0-9	6.2	7.5	2.2	6.0
	100.0	100.0	100.0	100.0

*Based on those convictions (68% of total convictions) where complete information on the type of violation was available.

Table 5.3 provides information on the dispositions of the tickets. The types of dispositions included fines, unconditional discharges, and conditional discharges. In the case of an unconditional discharge, the person is found guilty of the violation, but no penalty is imposed. Under a conditional discharge, the person is found guilty and is subject to whatever conditions are set by the court. Over 90 percent of all convictions statewide resulted in the imposition of a fine. Ninety percent of the fines were $25 or less, one-quarter were $10 or less, and only five percent were $50, the maximum fine stipulated by the law.

The number of each type of disposition and the amount of the fines varied by region. (Table 5.3) In the New York City and Long Island regions, virtually all convictions resulted in a fine. In the Upstate region, however, 15 percent of the persons convicted received either an unconditional or a conditional discharge.

Eighty-seven percent of the fines levied in New York City were $20. Thirty-five percent of the fines on Long Island were $20, 25 percent were $15, and 23 percent were within the $21-$25 range. The variation in the amount of fines was greater Upstate, where 42 percent of the fines were $10 or less, 13 percent fell within the range of $11-$15, 18 percent were $20, and 28 percent were greater than $20.

Some portion of the regional differences in the dispositions and the amount of the fines can be attributed to the fact that all of New York City and part of the Long Island region are included in the Administrative Adjudication system. This system, which also operates in the upstate cities of Buffalo and Rochester, was established by the Department of Motor Vehicles to alleviate backlogs in the courts in the more densely populated areas of the State. Administrative Adjudication attempts to dispose of similar violations in a consistent fashion. Persons convicted of violating the Mandatory Occupant Restraint Law are generally fined $20, as are persons convicted of other violations where no penalty points are assigned to the driver's license.

TABLE 5.3

1985 STATEWIDE AND REGIONAL SAFETY BELT CONVICTIONS BY TYPE OF DISPOSITION

DISPOSITION	Statewide (N=30243) %	Upstate (N=17210) %	New York City (N=5765) %	Long Island (N=7268) %
Fine	90.6	85.0	99.9	96.7
Conditional Discharge	6.1	9.5	<0.1	2.7
Unconditional Discharge	3.3	5.5	<0.1	0.6
	100.0	100.0	100.0	100.0
AMOUNT OF FINE*	(N=27345) %	(N=14581) %	(N=5762) %	(N=7002) %
$10 and less	24.7	41.5	3.9	6.9
$11 - $15	13.5	12.8	1.0	25.4
$16 - $20	36.9	17.8	86.9	35.4
$21 - $25	16.9	18.7	4.3	23.4
$26 - $50	8.0	9.2	3.9	8.9
	100.0	100.0	100.0	100.0

*Information on the amount of fine was missing for some convictions.

VIOLATIONS

In addition to the statewide conviction data, information on safety belt violations was obtained for a small group of counties included in the Traffic Safety Law Enforcement and Disposition (TSLE&D) system in 1985. This system allows for the computerized tracking of all tickets from the time the tickets are printed through final disposition in the courts. Statewide implementation of TSLE&D was completed in June 1986. However, when enforcement of the Mandatory Occupant Restraint Law began in January 1985, the TSLE&D system was operating in only 17 of the State's 62 counties. These counties in upstate New York are not representative of the State as a whole, but were studied because of the additional information available in the TSLE&D system. Since the TSLE&D system contains data on all tickets, including those that are dismissed or result in an acquittal, a conviction rate could be determined. The TSLE&D file also includes data relating to the issuance of the ticket that are not available on the driver's license file.

In 1985, nearly 7,400 safety belt tickets were issued in the 17 TSLE&D counties. This was approximately five tickets for every 1,000 licensed drivers residing in the area. Table 5.4 shows the types of safety belt violations for which tickets were written. Three-quarters of the tickets were issued to unbelted drivers.

TABLE 5.4

1985 SAFETY BELT TICKETS BY TYPE OF VIOLATION
IN 17 TSLE&D COUNTIES

	(N=7378) %
Driver	75.1
Front Seat Passenger Age 16 and Older	7.7
Front Seat Passenger Age 0-15	6.9
Back Seat Passenger Age 0-9	9.6
Unspecified Occupant	0.7
	100.0

The TSLE&D system also records the type of enforcement that resulted in the issuance of the safety belt ticket. As Table 5.5 indicates, the majority of tickets were issued on regular road patrols (65%) or during accident investigations (21%).

TABLE 5.5

1985 SAFETY BELT TICKETS BY TYPE OF ENFORCEMENT
IN 17 TSLE&D COUNTIES

	(N=7378) %
Patrol	64.5
Radar	6.4
Road Check	7.6
Investigation of a Personal Injury Accident	14.1
Investigation of a Property Damage Accident	6.6
Investigation of a Fatal Accident	0.3
Other	0.5
	100.0

Eighty-five percent of the tickets resulted in a conviction, and 15 percent resulted in a dismissal or an acquittal. (Table 5.6) Seventy percent of the persons convicted were fined and 15 percent received either a conditional or an unconditional discharge, with no fine levied. Nearly half of the fines were $10 or less.

As previously mentioned, a large proportion of the State's drivers reside in areas included in the Administrative Adjudication system. Since traffic offenses in these areas are disposed of in a more uniform manner than in other areas of the State, the conviction rate for the entire State was probably higher than the 85 percent identified for the 17 TSLE&D counties.

TABLE 5.6

1985 SAFETY BELT TICKETS BY TYPE OF DISPOSITION
IN 17 TSLE&D COUNTIES

DISPOSITION*	(N=6648) %
Conviction with Fine	69.7
Conviction Discharged Conditionally or Unconditionally	14.9
Dismissal	15.2
Acquittal	0.2
	100.0

AMOUNT OF FINE*	(N=4610) %
$ 0 - $10	48.4
$11 - $15	14.5
$16 - $20	10.2
$21 - $25	21.0
$26 - $50	5.9
	100.0

*Information on the disposition or the amount of fine was missing for some tickets.

DISCUSSION

Several issues related to the results of these analyses warrant further discussion. An important feature of New York State's safety belt law is the provision allowing primary enforcement. However, the number of convictions resulting from primary versus secondary enforcement cannot be definitively determined from the data available.

Usage rates and the number of convictions for other traffic violations are relevant factors in an examination of the extent of primary and secondary enforcement. The series of observational surveys, conducted as part of this evaluation, found that restraint use by front seat occupants was as high as 75 percent in January 1985, but declined to 57 percent statewide in April 1985 and 46 percent in September 1985. These findings suggest that a large proportion of front seat occupants were not buckling up in 1985. Furthermore, while the number of safety belt convictions was roughly comparable to the number of convictions for several other traffic offenses, it was only a small fraction of the convictions for speeding or failure to obey a stopping signal. The observed levels of safety belt use and the number of convictions for other traffic offenses indicate that the law was not being enforced fully on either a primary or secondary basis.

It is clear that the level of enforcement could be increased substantially. However, New York's strategy in the first year was to emphasize the message that safety belt use has positive safety benefits and encourage the habit of buckling up, rather than promote tough enforcement. This educational approach may have prevented the backlash against the law that has occurred in other jurisdictions, but it also may have contributed to a low perception of the risk of being stopped for noncompliance.

The attitudinal surveys of licensed drivers found that the decline in restraint use from April to September 1985 occurred at the same time that a decrease in the perception of risk was measured. The perception changed even though there was no substantial fluctuation in the number of convictions throughout the year. These findings suggest that increasing the perceived risk of enforcement may be one means to increase restraint usage.

The relationships among enforcement, the perception of risk, and usage are being tested in various jurisdictions in New York State. The goal is to identify a strategy to increase both the actual enforcement level as well as the perception of risk. With the completion of the statewide implementation of the TSLE&D system, a more comprehensive data base will be available to evaluate enforcement and adjudication practices in 1986 and subsequent years.

6. FATALITIES AND INJURIES AMONG MOTOR VEHICLE OCCUPANTS COVERED BY THE LAW

Usage rates, the reported behaviors, awareness, attitudes and perceptions of licensed drivers, and the enforcement and adjudication of violations are all important measures of the effects of the Mandatory Occupant Restraint Law on the driving public in New York State. However, the primary goal of the law is a reduction in death and serious injuries to vehicle occupants involved in accidents. In the final component of the evaluation, analyses of accident data were conducted to identify any changes in the number and pattern of injuries and deaths occurring after the implementation of the law.

METHODOLOGY

All the data were obtained from the automated accident file maintained by the New York State Department of Motor Vehicles. The evaluation methodology had to accommodate certain limitations in these data. For example, the lack of reliable information on restraint use by accident victims precluded the use of these data in the analyses. In addition, the absence of essential data on uninjured occupants for 1983 made it necessary to exclude 1983 from the baseline period.

The baseline data in this study consisted of accidents occurring in 1982 and 1984. The post-law data consisted of accidents occurring in 1985. Comparisons between the baseline and post-law periods were made for five categories of accident outcomes involving occupants covered by the law:

1) Fatalities

2) "A" or serious injuries (severe lacerations, broken or distorted limbs, skull fractures, crushed chest, internal injuries, being unconscious when taken from the accident scene, inability to leave the accident scene without assistance)

3) "B" or moderate injuries (lump on head, abrasions, minor lacerations)

4) "C" or minor injuries (momentary unconsciousness, limping, nausea, complaint of pain without visible injury)

5) Persons uninjured

An effective restraint use law should produce a reduction in serious injuries and fatalities sustained by vehicle occupants involved in accidents, given a constant level of accidents. An important concern in planning the analyses, however, was the fact that the total vehicle miles travelled in New York State rose from 80.4 billion miles in 1982 to 90.5 billion miles in 1985, while total accidents increased from 268,459 in 1982 to 292,804 in 1985. In order to control for these increases, an analysis plan was developed that viewed any changes in fatalities and injuries as changes in the proportion of total occupants killed, injured or uninjured. To translate any changes in these proportions into savings of persons injured or killed, the baseline proportions and the total number of occupants involved in accidents in 1985 were used to derive the number of occupants in each fatality/injury category that would have been expected in 1985 without the law. The difference between the expected and actual number of occupants in each category represented the savings assumed to be attributable to the effects of the law.

STATEWIDE RESULTS

Table 6.1 provides statewide data on the outcomes of accidents involving occupants covered by the law. If the injury/fatality pattern in 1985 had followed the baseline pattern, it is expected that 220 more occupants would have been killed, 3,469 more occupants would have received a serious (A) injury, 11,441 more occupants would have sustained a moderate

(B) injury, and 469 more occupants would have sustained a minor (C) injury. A total of 15,599 fewer occupants were injured in 1985 than would have been expected.

TABLE 6.1

STATEWIDE FATALITIES AND INJURIES
FOR OCCUPANTS COVERED BY THE LAW

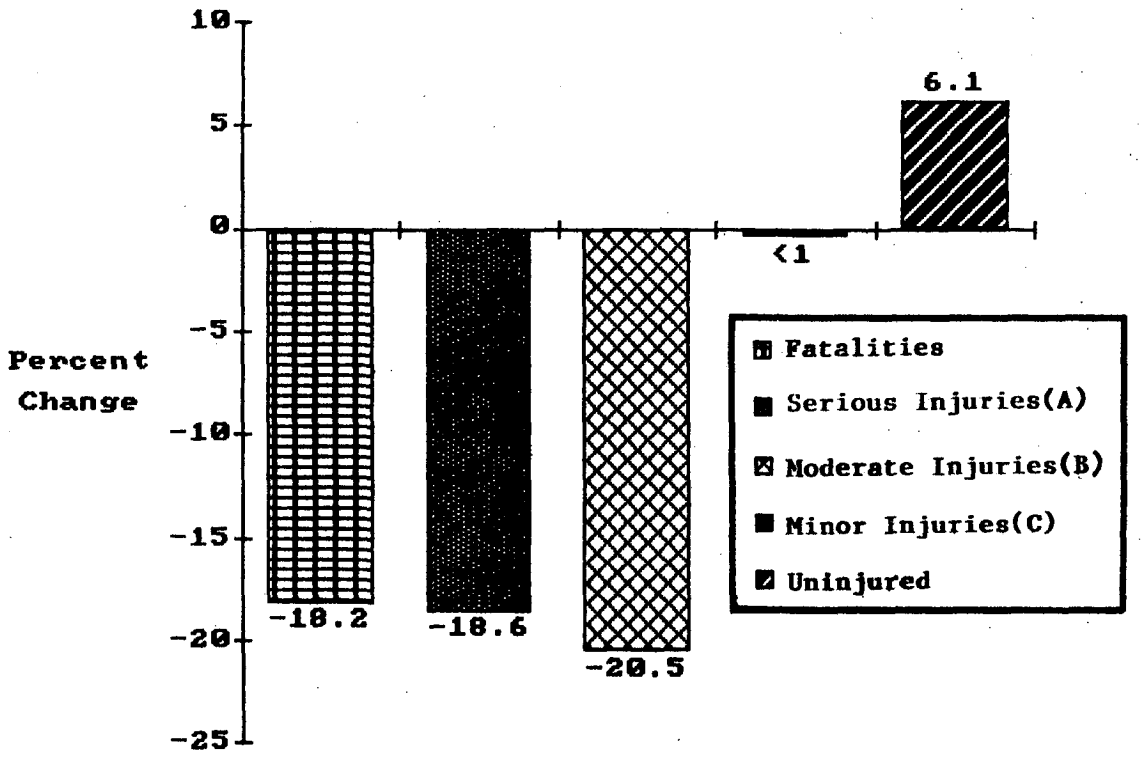
	*Baseline		1985		Difference Between Expected & Actual	Percent Difference Between Expected & Actual
	N	Ratio	**Expected N	Actual N	N	%
Fatalities	1093	0.27	1207	987	-220	-18.2
A Injuries	17058	4.17	18645	15176	-3469	-18.6
B Injuries	51077	12.48	55801	44360	-11441	-20.5
C Injuries	105232	25.71	114956	114487	-469	-0.4
Uninjured	234795	57.37	256517	272116	15599	6.1
Total Occupants	409255			447126		

* The baseline represents the mean of the 1982 and 1984 data.
** 1985 Expected = (Baseline Ratio) x (1985 Actual Total Occupants).

These estimated savings translate into reductions of 18 percent in fatalities, 19 percent in A injuries, 21 percent in B injuries, and less than one percent in C injuries. The actual number of uninjured occupants was six percent higher than the number expected. The percentage reductions are presented graphically in Figure 6.1.

FIGURE 6.1

PERCENTAGE CHANGES IN FATALITIES AND INJURIES
FOR OCCUPANTS COVERED BY THE LAW



The statewide fatality and injury data were further analyzed by the four quarters of the year. (Table 6.2) Large savings in fatalities and in serious and moderate injuries occurred within each of the four quarters of 1985. The largest variation among quarters occurred in fatalities. The second-quarter decrease in fatalities (9%) was substantially lower than the decreases in the other three quarters, which ranged from 18 percent to 27 percent. The reason for this deviation is not readily apparent.

TABLE 6.2*

QUARTERLY STATEWIDE FATALITIES AND INJURIES
FOR OCCUPANTS COVERED BY THE LAW

	**Baseline N	Ratio	***Expected N	1985 Actual N	Difference Between Expected & Actual N	Percent Difference Between Expected & Actual %
FIRST QUARTER						
Fatalities	225	0.24	231	169	-62	-26.8
A Injuries	3788	4.08	3921	3192	-729	-18.6
B Injuries	11891	12.80	12302	9285	-3017	-24.5
C Injuries	24157	26.01	24998	24195	-803	-3.2
Uninjured	52830	56.87	54657	59268	4611	8.4
Total Occupants	92891			96109		
SECOND QUARTER						
Fatalities	270	0.27	302	275	-27	-8.9
A Injuries	4235	4.17	4666	3744	-922	-19.8
B Injuries	12580	12.38	13851	10843	-3008	-21.7
C Injuries	25855	25.43	28452	28289	-163	-0.6
Uninjured	58700	57.75	64614	68734	4120	6.4
Total Occupants	101640			111885		
THIRD QUARTER						
Fatalities	289	0.28	320	264	-56	-17.5
A Injuries	4401	4.22	4821	4041	-780	-16.2
B Injuries	13092	12.57	14360	11566	-2794	-19.5
C Injuries	26068	25.02	28582	28856	274	1.0
Uninjured	60324	57.91	66156	69512	3356	5.1
Total Occupants	104174			114239		
FOURTH QUARTER						
Fatalities	309	0.28	350	279	-71	-20.3
A Injuries	4635	4.19	5233	4199	-1034	-19.8
B Injuries	13515	12.23	15274	12666	-2608	-17.1
C Injuries	29153	26.37	32934	33147	213	0.6
Uninjured	62942	56.93	71102	74602	3500	4.9
Total Occupants	110554			124893		

* Because the proportions in this table are based on the number of occupants within each quarter of the year rather than on the total occupants statewide, the data in this table and the statewide Table 3.1 may show slight variations. Slight variations may also be noted between the sum of the categories in this table and the statewide total as reported in Table 3.1 due to rounding or missing data elements for some accident records.

** The baseline represents the mean of the 1982 and 1984 data.

*** 1985 Expected = (Baseline Ratio) x (1985 Actual Total Occupants)

REGIONAL RESULTS

Regional data on fatalities and injuries involving the occupants covered by the law were also analyzed. (Table 6.3) All three regions experienced decreases in the number of fatalities and serious and moderate injuries and increases in the number of uninjured occupants.

While the configuration of changes in the Long Island and Upstate regions were very similar, the shifts in injuries and fatalities in New York City differed from the other two regions. The three regions experienced similar savings in A and B injuries. When the expected and actual totals were compared for these two categories combined, the decreases were 19 percent in the Long Island and Upstate regions and 22 percent in New York City. The estimated percentage decrease in fatalities, however, was much larger in New York City than in the other two regions. Fatalities declined 40 percent in New York City, 11 percent Upstate, and nine percent on Long Island. Finally, while the proportion of C injuries increased marginally in the Upstate and Long Island regions, the number of C injuries in New York City in 1985 was seven percent lower than the expected total.

The reasons for the larger savings in New York City are not clear, but some of the differences between New York City and the rest of the State may be attributable to differences in the vehicle mix, the driver populations, the average speed, and other variables that affect the nature of crashes.

TABLE 6.3*

FATALITIES AND INJURIES BY REGION
FOR OCCUPANTS COVERED BY THE LAW

	**Baseline		1985 ***Expected	Actual	Difference Between Expected & Actual	Percent Difference Between Expected & Actual
	N	Ratio	N	N	N	%
UPSTATE						
Fatalities	748	0.38	787	700	-87	-11.1
A Injuries	9222	4.65	9626	7799	-1827	-19.0
B Injuries	28049	14.15	29293	23894	-5399	-18.4
C Injuries	45676	23.04	47698	49021	1323	2.8
Uninjured	114530	57.78	119617	125607	5990	5.0
Total Occupants	198225			207021		
NEW YORK CITY						
Fatalities	163	0.14	187	112	-75	-40.1
A Injuries	4466	3.97	5306	4329	-977	-18.4
B Injuries	11869	10.55	14101	10766	-3335	-23.7
C Injuries	35811	31.84	42556	39403	-3153	-7.4
Uninjured	60177	53.50	71505	79045	7540	10.5
Total Occupants	112486			133655		
LONG ISLAND						
Fatalities	182	0.18	192	175	-17	-8.9
A Injuries	3371	3.42	3641	3049	-592	-16.3
B Injuries	11160	11.32	12052	9702	-2350	-19.5
C Injuries	23748	24.10	25659	26073	414	1.6
Uninjured	60093	60.98	64924	67469	2545	3.9
Total Occupants	98554			106468		

* Because the proportions in this table are based on the number of occupants within each region rather than on the total occupants statewide, the data in this table and the statewide Table 3.1 may show slight variations. Slight variations may also be noted between the sum of the categories in this table and the statewide total as reported in Table 3.1 due to rounding or missing data elements for some accident records.

** The baseline represents the mean of the 1982 and 1984 data.

*** 1985 Expected = (Baseline Ratio) x (1985 Actual Total Occupants)

SEATING POSITION OF OCCUPANTS

The injuries and fatalities sustained in vehicles covered by the law were also examined by the seating position of the occupants. Table 6.4 presents information for four categories of occupants: drivers, front seat passengers, back seat passengers under ten years of age, and back seat passengers ten years of age and over. Of these four categories, back seat passengers ten years of age and older were the only group not covered by the law.

Sizable percentage decreases in fatalities occurred in 1985 among the three groups covered by the law. There was an estimated decrease of 16 percent for drivers, 25 percent for front seat passengers and 40 percent for back seat passengers under ten years of age. The group not covered by the law, back seat passengers ten years and older, experienced only a one percent decline in fatalities.

Large percentage declines also occurred in the number of very serious (A) and moderately serious (B) injuries sustained by occupants in each of the four groups. Drivers and front seat passengers experienced the largest declines; the total A and B combined injuries for these groups were reduced by 20 percent and 22 percent, respectively, from the expected totals. The decline for back seat passengers under ten years of age was 13 percent, while older back seat passengers experienced a decline of 16 percent.

The changes in minor (C) injuries were less consistent. Decreases of 15 percent and eight percent occurred among back seat passengers under ten years of age and back seat passengers ten years of age and older, respectively. Front seat passengers experienced two percent fewer minor injuries, while drivers experienced a one percent increase in minor injuries.

The savings in fatalities and injuries among back seat passengers ten years of age and older may be a spillover benefit from the law. Although attitudinal surveys found that virtually all New York State drivers were aware that the Mandatory Occupant Restraint Law had been passed, there may have been many who were not aware that restraint use was not required for back seat passengers over ten years of age. Another explanation could be that an increase in restraint use by front seat occupants may have provided an incentive for adult back seat passengers to buckle up as well.

TABLE 6.4

FATALITIES AND INJURIES BY SEATING POSITION
FOR ALL OCCUPANTS IN VEHICLES COVERED BY THE LAW

	*Baseline N	Ratio	**1985 Expected N	Actual N	Difference Between Expected & Actual	Percent Difference Between Expected & Actual %
DRIVERS						
Fatalities	791	0.28	888	749	-139	-15.7
A Injuries	12355	4.30	13643	11167	-2476	-18.1
B Injuries	35490	12.34	39151	31292	-7859	-20.1
C Injuries	72372	25.17	79857	80598	741	0.9
Uninjured	166476	57.91	183731	193464	9733	5.3
Total Occupants	287484			317270		
FRONT SEAT PASSENGERS						
Fatalities	285	0.27	302	226	-76	-25.2
A Injuries	4437	4.19	4683	3758	-925	-19.8
B Injuries	13854	13.08	14619	11349	-3270	-22.4
C Injuries	30082	28.41	31752	31181	-571	-1.8
Uninjured	57244	54.05	60408	65250	4842	8.0
Total Occupants	105902			111764		
BACK SEAT PASSENGERS UNDER TEN YEARS						
Fatalities	17	0.11	20	12	-8	-40.0
A Injuries	266	1.67	302	252	-50	-16.6
B Injuries	1733	10.92	1977	1721	-256	-12.9
C Injuries	2778	17.50	3167	2709	-458	-14.5
Uninjured	11081	69.80	12634	13406	772	6.1
Total Occupants	15875			18100		
BACK SEAT PASSENGERS TEN YEARS AND OVER						
Fatalities	92	0.23	94	93	-1	-1.1
A Injuries	1397	3.51	1437	1235	-202	-14.1
B Injuries	4282	10.76	4405	3666	-739	-16.8
C Injuries	11136	27.98	11454	10596	-858	-7.5
Uninjured	22898	57.52	23548	25348	1800	7.6
Total Occupants	39805			40938		

* The baseline represents the mean of the 1982 and 1984 data.
** 1985 Expected = (Baseline Ratio) x (1985 Actual Total Occupants)

DISCUSSION

The savings in lives and injuries identified in these analyses could only be estimated. Two major limitations in the data that affected the research design and the results were the inherent imprecisions in the injury classification system and the absence of reliable data on restraint use among accident victims. Since it is impossible to know to what extent restraint use among accident victims increased and, therefore, to identify more specifically the effects of the law, some portion of the savings estimated for 1985 may be attributable to other factors. However, the research design sought to mitigate the effects of the major complicating factors: the implementation of other major traffic safety programs and increases in vehicle miles travelled and the total number of accidents.

Analyses of accident data for 1986 and future years will indicate whether the variations in the size and pattern of injuries by region and other variables found in 1985 are sustained over time.

7. DISCUSSION AND RECOMMENDATIONS

The purpose of this evaluation project was to determine the first-year effects of the nation's first Mandatory Occupant Restraint Law. New York State's law, which was fully implemented on January 1, 1985, requires front seat passengers and all children under ten years of age to use safety restraints. An effective law would be expected to produce an increase in the number of persons using safety restraints and a reduction in the number of fatalities and serious injuries resulting from traffic accidents. The primary purpose of the evaluation was to determine whether these changes occurred.

Several important findings emerged from the evaluation effort:

1. Following the implementation of the law, there was a large increase in restraint usage among vehicle occupants covered by the law.

Statewide observational surveys of front seat occupants found that restraint use more than tripled after the law took effect. Large increases in usage occurred on weekends and weekdays, at different times during the day, and at night. Separate surveys of children under ten years of age reinforced this finding. Restraint use among children, even those covered by earlier mandatory use legislation, was much higher after the law took effect.

Each of the three regions of the State also experienced substantial increases. The Upstate region achieved the highest usage, followed by Long Island, then New York City.

A large increase in usage was also reported by licensed drivers in statewide telephone surveys. The reasons given for buckling up suggest that the initial increase in usage was largely a result of the implementation of the law.

2. The observed usage rates declined over time, but remained much higher than the baseline rates.

The initial post-law usage rates were not sustained, but usage in September 1985 was still much higher than the baseline level. This was true for front seat occupants, for children and for all three regions. The region with the lowest usage rate, New York City, experienced the largest decrease.

A decrease in reported usage was also identified in the telephone surveys. A number of possible explanations for the decline in usage may be found in the survey results. In the second post-law telephone survey, when observed and reported usage had declined, a smaller proportion of drivers said they were buckling up because of the law than in the first post-law survey. This suggests that the mere implementation of the law may have caused some of the initial increase in usage but was not a sufficient reason to motivate sustained usage for some persons. The main reasons given for <u>not</u> buckling up were the failure to develop the habit of safety belt use and the inconvenience of buckling up. Relatively few drivers cited opposition to the law as a reason for not using a restraint. One possible interpretation of these survey data is that some drivers who initially buckled up in response to the law and the publicity surrounding the law's implementation became less conscientious over time as the publicity surrounding the law decreased.

There did not appear to be a relationship between the changes in usage rates and support for the law. While usage changed dramatically between the baseline survey and the first post-law survey, the level of support for the law remained the same. Furthermore, support for the law increased in

the second post-law survey, but the level of restraint usage declined. On a regional basis, more drivers in the New York City and Long Island regions were in favor of the law, but usage was highest in the Upstate region.

Another factor that may have affected the level of usage was the perceived risk of being stopped for noncompliance with the law. Prior to implementation of the law, about 40 percent of the drivers surveyed predicted that the law would be strictly enforced. In the first post-law survey, only 27 percent of the drivers thought that the law was actually being strictly enforced, and by the second post-law survey, the perception of strict enforcement had fallen to 23 percent. This decline in the perception of strict enforcement occurred at the same time that usage declined.

The pattern was not as clear in the three regions. In the baseline survey, New York City drivers were least likely to anticipate strict enforcement of the law. In the first post-law survey, the perceived level of enforcement was lower than the level anticipated in all three regions, and lowest in New York City. In both surveys, New York City also had the lowest usage rates. In the second post-law survey, when usage decreased in all three regions, the perception that the law was being strictly enforced declined in the Upstate and the Long Island regions, but increased slightly in New York City. As a result, the perception of strict enforcement was similar in all three regions in September 1985, but usage ranged from 53 percent in the Upstate region to 40 percent in New York City.

While changes in the perception of enforcement occurred as usage declined statewide, the actual level of enforcement across the State fluctuated very little over the year. In 1985, the more than 30,000 convictions for violations of the safety belt law were distributed fairly evenly over the twelve months. The total of 30,000 convictions was

comparable to the number of convictions for several other offenses, including improper turns and failure to yield the right of way, but was only a small fraction of the convictions for speeding or failure to obey a stopping signal. Given the levels of noncompliance observed in 1985 and the number of opportunities for secondary, as well as primary enforcement, it is evident that the actual level of enforcement, as well as the perceived level, was low.

The levels of regional usage were more closely linked to differences in the perception of enforcement than to differences in the conviction rates. Long Island, whose usage was higher than New York City's rates and lower than those in the Upstate region, had the highest number of convictions per licensed driver. The Long Island region also had the highest number of convictions per registered vehicle. The Upstate and New York City regions had the same conviction rate based on registered vehicles, but substantial differences in usage.

3. Substantial savings in fatalities and serious injuries among occupants covered by the law occurred during the first year of the law's implementation.

The ultimate measure of the effectiveness of the safety belt law is its impact on the number of fatalities and injuries resulting from traffic accidents. In 1985, it is estimated that 220 lives were saved and 3,500 serious injuries and 11,400 moderate injuries were prevented. These savings translated into an 18 percent reduction in fatalities, a 19 percent reduction in serious injuries, and a 21 percent reduction in moderate injuries.

A commonly applied formula can be used to determine the reduction in fatalities that would have been anticipated in New York in 1985.[1] The formula is based on the change in usage rates between two time periods and an estimate of the likelihood that a restrained front seat occupant will escape death. The National Highway Traffic Safety Administration has estimated that the use of occupant restraints is between 40 and 50 percent effective in preventing fatalities among front seat occupants. Although reliable data on restraint use among accident victims were not available, the statewide observational surveys provided highly reliable estimates of usage for front seat occupants in general. Using the baseline usage rate of 16 percent and a post-law rate of 55 percent, and assuming that safety belts are 45 percent effective in reducing fatalities, an anticipated 19 percent savings in fatalities was derived. The 18 percent reduction in fatalities estimated in this evaluation project was very close to the reduction that would have been anticipated, based on this formula.

Using the same formula, fatality savings of 16 percent to 20 percent would have been anticipated for the three regions. However, the regional reductions that were calculated in this evaluation, based on the baseline distribution of fatalities and injuries and the actual 1985 fatality and injury data, varied substantially from the anticipated savings. The estimated reductions in fatalities among front seat occupants in the Upstate (11%) and Long Island (9%) regions were smaller than the anticipated savings, while New York City experienced a much larger reduction (40%) than the formula predicted.

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[1] James Hedlund, "Casualty Reductions: Results from Safety Belt Use Laws," Effectiveness of Safety Belt Use Laws: A Multinational Examination (Washington, D.C.: National Highway Traffic Safety Administration, October 1986) pp. 75-76. Formula: proportionate fatality reduction = $(e(u_2-u_1/(1-eu_1)$.

Since New York City's usage rates were the lowest in the State, it is difficult to explain why New York City's fatality reductions were the largest. The failure of the formula to predict more accurately the size of the fatality reduction in each region suggests that the relationship between usage and fatalities is much more complex than the formula would indicate. While the Upstate and Long Island regions are similar in some respects, New York City is unique in terms of population density and many other characteristics. The formula uses only the change in usage rates between two time periods and an estimate of safety belt effectiveness to derive the anticipated savings in fatalities. Perhaps there are other driver, vehicle, or environmental characteristics associated with different regions of the State that also affect the size of the savings.

For instance, the characteristics of fatal crashes in New York City may differ from those that occur in the rest of the State. Factors like the average speed, road types and conditions, and the vehicle mix may vary among the regions in such a way that a larger proportion of the potentially fatal accidents in New York City become survivable if safety belts are worn. In addition, New York City has a smaller proportion of alcohol-related accidents and a smaller proportion of young drivers than the other two regions. Drinking drivers and young drivers may be less likely to wear safety belts. Since New York City has fewer of these "high risk" drivers, the use of safety belts in the most serious accidents may have been higher in New York City than in the Upstate and Long Island regions. However, without reliable usage data for accident victims, these speculations cannot be confirmed.

Another possible explanation for New York City's large fatality reduction is that 1985 was an aberrant year for fatalities in that region. Additional years of post-law data must be studied before any conclusions can be drawn.

These issues point to the importance of including analyses of injuries as well as fatalities in any assessment of safety restraint laws. The mitigation and prevention of injuries represent an important benefit of these laws, especially since restraint use cannot prevent fatalities in some very severe accidents. While the reductions in serious injuries varied less by region than the reductions in fatalities, there were other variations in the the statewide injury data by the time of the year, age, gender and seating position. These results also require further study.

This volume has summarized the results of a comprehensive evaluation of the nation's first Mandatory Occupant Restraint Law. The evaluation of the law's first year indicated that the major goals of the legislation were accomplished. Safety restraint usage increased dramatically, and fatalities and injuries among vehicle occupants involved in traffic accidents were reduced. While the law clearly resulted in substantial highway safety benefits in 1985, this early study of New York's experience could not provide all the answers regarding how these results were achieved and how the benefits from the law can be increased in the future. Additional questions concerning the relationships among restraint use, drivers' attitudes and perceptions, enforcement, and traffic fatalities and injuries emerged from this evaluation. New York and other states should consider the following recommendations in planning future efforts to increase usage rates and evaluate the effects of mandatory occupant restraint laws.

RECOMMENDATIONS

- Identify characteristics of the vehicle occupants who do not obey the law and the reasons for noncompliance for use in the development of programs to increase and sustain high usage levels.

- Monitor the content and scope of any public information and education campaigns and assess the effects on usage rates.

- Increase the actual and perceived risk of enforcement and monitor the effects on compliance.

- Determine the extent of primary versus secondary enforcement and how police attitudes affect both primary and secondary enforcement of the law.

- Examine the effect increased penalties would have on usage rates.

- Identify judicial attitudes and adjudication practices and determine whether these affect the levels of enforcement and compliance.

- Analyze the relationship between safety belt use and the driver, vehicle, and environmental characteristics of accidents resulting in fatalities and serious injuries.

- Investigate other sources of reliable restraint use and injury data for accident victims.

- Monitor changes in specific categories of injuries that are likely to be affected by increased restraint use.

- Continue to collect and analyze post-law data to determine the long-term effects of the law.