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Final Report

Use of Safety Restraints by Law Enforcement Officers Following Safety Belt Training and Passage of a State-wide Belt Law

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16. Abstract

This report describes work performed in 1984-1985 to develop and evaluate a safety belt program designed for the Maryland State Police - Belt Use Campaign for Law Enforcement (BUCLE), and an evaluation conducted in 1987 to determine the impact of the program on the belt use of the Maryland State Police following enactment of a mandatory safety belt use law in Maryland. The initial evaluation of the program, prior to the mandatory use law, found a significant increase in observed belt use - from 21% prior to the program to 42% after the program. A second evaluation of theprogram, following passage of the mandatory safety belt use law (the law does not exclude police officers from using safety belts), found the observed belt use by the Maryland State Police to be 91%.

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PREFACE

The work described in this report was carried out by the National Public Services Research Institute for the National Highway Traffic Safety Administration. The first phase occurred in 1984-85 and involved the development, administration, and evaluation of a Belt Use Campaign for Law Enforcement (BUCLE) program consisting of information, instruction, and a special incentive for increasing safety belt use. The second phase took place in 1987 after Maryland had passed the mandatory safety belt use law requiring the wearing of restraints by all motor vehicle occupants including law enforcement personnel. Both efforts were funded by NHTSA, the first under Contract No. DTNH22-84-C-07254 and the second under Purchase Order DTNH22-87-T-07433.

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USE OF SAFETY RESTRAINTS BY LAW ENFORCEMENT OFFICERS FOLLOWING SAFETY BELT TRAINING AND PASSAGE OF A STATE-WIDE BELT LAW

by A. James McKnight, Kenard McPherson and Brian G. Hilburn
National Public Services Research Institute

In 1980, the Maryland State Police (MSP) had 351 accidents involving agency vehicles. This amounted to an accident rate of about 9.5 per million miles driven, over double the figure for all drivers over the age of 21. These accidents cost the agency 38 injuries, 734 lost working days, and nearly $100,000 in lost time.

While the high accident rate was probably due, in large part, to the conditions under which patrol officers must work, no primary factor could be identified as the cause. High speed pursuit situations, somewhat surprisingly, accounted for only a small fraction of all agency vehicle accidents. These facts made it difficult to implement specific countermeasures in order to reduce the frequency of accidents, as a means of achieving lower accident costs.

An alternative approach was a program designed to reduce accident injury severity through safety belt use. A 100 percent effective program of restraint usage, the National Highway Traffic Safety Administration estimates, could result in injury reductions of roughly 50 percent. Additional benefits of such a program would include (1) increased support of public restraint use information programs, and (2) reenforcement of the agency's role as a model of safe vehicle operation.

In 1984 the Maryland State Police (MSP), with the assistance of the National Public Services Research Institute (NPSRI), undertook the Belt Use Campaign for Law Enforcement (BUCLE) program consisting of information, instruction, and a specific incentive for increasing belt use. In 1986, Maryland passed a mandatory safety belt use law requiring the wearing of restraints of all motor vehicle occupants. Law enforcement personnel were not exempt.

This report describes work performed in 1984-1985 to develop and evaluate the BUCLE program, as well as a subsequent evaluation of the impact of the program on the belt use of the MSP following enactment of a mandatory safety belt use law. The current report is divided into three sections as follows:

- Attitudes of enforcement personnel
- Evaluation of the BUCLE program
- Evaluation of the belt use law

ATTITUDES OF ENFORCEMENT PERSONNEL

The objective of BUCLE was the development of a safety belt use program specific to the needs of the MSP. An agency-wide convention of both patrol and command level personnel provided the project staff the opportunity to assess the prevailing attitude among MSP employees toward safety belts.

METHODS

The method employed in determining the attitudes of the MSP was group discussions in which law enforcement officers discussed with one another both safety belt use and current MSP safety belt policy. The hour-long focus group discussion were held at Maryland State Police headquarters at the time that law enforcement officers were convened for in-service training programs. Two of the discussions involved trooper-level personnel while one involved corporals.

Ninety-one officers participated in the discussion activity. They were divided into groups of approximately 15-20 officers each in order to permit more individual expression.

While the participants were encouraged to express their opinions freely, they were prompted by a series of questions to assure that the most important issues were discussed. The moderators varied the questions as needed to encourage free and open discussion. The sessions were tape recorded, with the participants' knowledge, in order to allow important information to be extracted at a later date. This was necessary to keep the collection of information from interfering with the course of the discussions.

Since the purpose of the discussions was primarily to identify the kinds of obstacles to safety belt use that the BUCLE program would have to cope with, the information collected was largely qualitative. No attempt was made to compile statistics on belt use or opinions toward their use.

RESULTS

The officers participating in the discussions held many of the same attitudes as motorists in general, including many of the same misconceptions. However, most of the reasons given for wearing and not wearing safety belts were rather unique to the law enforcement situation.

Attitudes Toward Use of Safety Belts

The majority of MSP officers were favorably inclined toward the use of safety belts on certain occasions. Those occasions were primarily when in pursuit of offenders. Only a minority wore them in routine patrol operations.

Reasons for Wearing Safety Belts

The primary reason for wearing safety belts, when they were worn, was to prevent injury in the case of a serious accident. Since such accidents were believed most likely to occur during pursuit, safety belts were worn most frequently at that time. Most of those who wore belts all the time also did so to prevent injury. Most had heard about, witnessed or even experienced accidents in which wearing belts had prevented injury or not wearing them had resulted in injury.

Most officers also felt that safety belts helped them to maintain control of the vehicle during pursuit. Some had received advanced driver training and had experienced the effect of safety belts to allow the driver to maintain control during violent maneuvers.

While it was not given as a major reason for wearing safety belts, several participants claimed that the desire to set a good example for the public played a role in their decision to use them. A small number of those wearing safety belts during routine patrols claimed they did so simply because it was required by policy and disciplinary action could be taken if they were involved in an accident and were not wearing belts.

Reasons for Not Wearing Safety Belts

The reasons for not wearing safety belts were many and varied. They can be divided into the following four categories for the purpose of discussion:

- Interference
- Hazard
- Discomfort
- Forgetfulness

Interference

This was the most commonly given reason for not wearing safety belts. The objections took the following forms:

"Can't get out quickly"--This was the most commonly given excuse. In the case of an emergency, officers wanted to be able to get out of the vehicle quickly and felt that the time taken to release the safety belt prevented a quick exit.

"It's inconvenient getting out"--In addition to interfering with a quick exit, safety belts were thought to be a considerable inconvenience to officers who have to keep getting in and out of the vehicle. It was "just one more thing to do" along with getting their citation books and putting on their hats.

"Catches on the gun"--Many claimed that the belt caught on the handle of the gun, increasing the time it took to disconnect the belt.

"You lack total control"--The various forms of interference gave some participants a feeling of not being able to respond quickly to any situation and, therefore, of not having "total control."

"You can't reach things"--Many felt that safety belts would inhibit their ability to reach the glove compartment, radio, and so on. Since the restraint systems in their vehicles use inertial reels, it's hard to believe that these officers actually wore their safety belts.

Hazard

Many officers felt that wearing safety belts was more hazardous than not wearing them, at least under certain circumstances. In this respect, their opinions parallel those of the public at large. Opinions voiced included the following:

"Keeps you in the vehicle"--This opinion was not totally a reflection of the common misconception that it is safer to be ejected from a vehicle than being held in it. Rather, it was based upon experiences in which it was necessary to cut the safety belt in order to remove a passenger from a vehicle after a crash. These officers apparently did not consider it likely that those passengers would have been more severely injured by being ejected from the vehicle or colliding with the interior.

"It holds you at the point of impact"--A number of officers expressed the opinion that, in a left-side impact, the safety belt would hold the driver at the point of impact. They appeared to believe that, if they were unrestrained, they would be thrown across the seat. (In reality, they would move toward the point of impact rather than away from it.)

"I don't trust the inertial reel"--Several officers expressed a lack of confidence in the inertial reel. They felt it simply wouldn't work in an accident. If this were the case, there would be no point in putting up with the "interference" and "discomfort."

"It causes the head to snap"--One officer expressed the opinion that, in an accident, it is better for the entire body to move than for the body to be held in place and the head to move. In short, they attributed whiplash to wearing a safety belt.

"You can't duck if you're shot at"--This was only raised by one participant but reflects misunderstanding of how an inertial reel system works (as well as the relative probabilities of accidents and being shot at).

Discomfort

Discomfort was a frequently given reason for failing to wear safety belts, although it was not advanced as the most important reason. Specific causes of discomfort were:

"It catches on the badge"--If pulled tight, the shoulder harness can catch in the badge. When asked if this could be ameliorated by loosening the harness somewhat, most felt to do so would be to defeat the purpose of the harness.

"It cuts off circulation"--Many felt that prolonged wearing of safety belts, particularly lap belts, cut off circulation and led to fatigue. They apparently did not buy the notion that, by helping to hold them upright, belts actually reduce fatigue.

"It holds you to the seats"--Many complained about the "cheap vinyl" seats in some of the vehicles caused them to perspire. Being held to the seat by the safety belt only aggravated the problem.

Forgetfulness

Many of those who did not wear safety belts claimed to be convinced of their merits but simply forgot to fasten them.

Attitudes Toward Policy

Very few officers expressed truly favorable attitudes toward administrative policy requiring safety belt use. Most of those who wore belts claimed they would do so in the absence of a policy requiring it. Those who did not wear them, and those who wore them only because of the policy, were not generally in sympathy with the policy.

In the absence of truly favorably attitudes, the attitudes that were held can be ordered from roughly neutral to strongly negative, as follows:

"We have an obligation to accept it"--Most senior and more experienced officers felt they should abide by current safety belt policy as an obligation. In joining the MSP, they agreed to accept its policies; if they are against those policies, they should leave.

"Education is better than force"--Many of those favorable to the wearing of safety belts thought they should be encouraged, but through education rather than a policy mandating use.

"It's unenforced and unenforceable"--Many of those who wear belts, and many of those who do not, objected to the policy primarily on the grounds that it won't accomplish anything. They saw no current enforcement and no way that such enforcement would be possible.

"It's our lives"--Many felt that wearing safety belts, being a matter of self preservation, was something that officers should be allowed to decide for themselves. They didn't seem to feel that the department had a stake in their injuries.

"Headquarters doesn't practice its own policy"--Many who don't wear safety belts object to the policy on the grounds that it is not adhered to even by those who formulate policy. On their visits to MSP Headquarters, they claim to have observed that the policy was largely being ignored.

"It's unfair"--Many objected to the policy because they felt it violated their rights as citizens. If the public at large is not required to wear safety belts, they did not feel they should be required to.

"It's just to cover their ass"--Some officers felt that the policy had only been created to keep the MSP from being held liable in the event someone was injured in an accident. If an officer attempted to sue, MSP could escape liability by claiming that the individual was violating policy.

Attitudes Toward Incentives

The officers were given an opportunity to react to the idea of using incentives, both positive and negative, to encourage safety belt use. In some cases, the incentives were suggested by the group itself.

Positive Incentives

The positive incentives discussed ranged from awarding of prizes (cash, premiums, time off) to simple acknowledgement or awards. Incentives would be given either for observed safety belt use or for having been wearing one when an accident occurred. While acknowledging that such incentives might succeed in increasing belt use, most felt that the use of such incentives was not appropriate to a law enforcement agency.

Negative Incentives

Negative incentives discussed included reprimands, extra duty, and leave without pay for violation of belt wearing policy. Most acknowledged that penalties would probably increase safety belt use. However, they were opposed to them for the following reasons:

"Shouldn't penalize those injured in the line of duty"--Many looked upon accidents as being "part of the job" and felt that people who were injured in accidents should be the object of sympathy rather than disciplinary action. (They apparently did not distinguish accidents from injuries in the line of duty.)

"It's just harassment"--Many viewed safety belt penalties as just another instance of harassment over trivial issues. Some of the more senior and experienced officers felt that part of the problem was that there were so many unimportant, petty policies that some of the good policies get confused with them. Several participants voiced the opinion that, on the matter of safety belts, they were being "treated like children."

"It can be used unfairly"--Several participants expressed the fear that punishment for not wearing safety belts might not be applied even-handedly but would be used to "get back at" subordinates who were in disfavor.

EVALUATION OF THE BUCLE PROGRAM

Based upon the attitudes expressed by law enforcement personnel, the Belt Use Campaign for Law Enforcement (BUCLE) program was developed to encourage safety belts by MSP personnel. This section will describe the program, the methods used to evaluate it, and the results of the evaluation.

THE BUCLE PROGRAM

The BUCLE program consisted of the following components:

- Information module
- Instruction module
- Incentive module

Information Module

The Information Module of the program drew its substance from a standing policy that all MSP employees must wear restraints when operating MSP vehicles. A brochure was prepared (see Appendix A) and distributed to provide a formal statement of this policy. The brochure further attempted to convey to all personnel the benefits of safety belt use by stressing that:

- MSP personnel run an extraordinarily high risk of a traffic accident
- MSP personnel are in an exceptional position to communicate a positive safety image to the public, and as civil servants have the obligation to do so
- The cost associated with an injury from a traffic crash could be horrendous for a trooper's family, the agency, and society
- Non-complaint personnel run the risk of punitive action

- It is in everyone's best interest for MSP personnel to wear safety belts.

The safety belt information and formal policy statement were distributed to all MSP personnel. The use of the brochure as a statement of policy required that all agency employees be identically informed of the policy and consequences for not abiding by the policy.

Instruction Module

Review, selection, and modification of existing safety belt programs led to the development of a course that was custom-tailored to MSP personnel needs and attitudes, as revealed in the developmental group discussions. The three-and-one-half hour course centered on the value of restraints in reducing accident-related costs and injuries. The course (see Appendix B) consisted of three major components:

- Presentation
- Accident experience
- Impact experience

Presentation

This component of the Instruction Module consisted of the presentation of factual information through slides and instructor-led small discussion groups. The presentation attempted to communicate factual information on the benefits and values of safety belts in reducing accident-related injuries and costs. Primary consideration was given to the physical forces involved in an automobile collision, and the impact those forces have upon the human body (second collision). Statistics were analyzed to demonstrate to the audience both the benefits of safety belt use in accident situations and the high probability that an MSP employee will be involved in a serious accident.

As some MSP personnel held an unfortunately high number of misconceptions regarding the use of safety restraints and their value in reducing automobile collision injury; the second part of the presentation attempted to dispel these myths. In addition, consideration was given to concerns that officers had voiced regarding:

- The value of restraints in adverse weather conditions
- The actual injury cost to a trooper's family, agency, and state
- The importance of restraint use for MSP public image
- The value of safety belt use in a standing vehicle.

Accident Experience

This portion of the Instruction Module consisted of a 20-minute videotape of testimonials by MSP personnel who were themselves accident victims. By using actual troopers in these testimonials, the presenter was able to bring home several points regarding:

- o Consequences of their accident
- o The impact forces and physical realities of their accident
- o The consequences of their injuries, their physical and monetary costs
- o The reality of seat belt use, in hopes of motivating increased restraint use by the MSP audience

These points would be conveyed as some of the troopers had been spared injury by the use of restraints, while others had been injured in situations where they had failed to use restraints.

The accident victims conveyed their thoughts and feelings through an informal discussion. The discussions centered around the nature of their particular accident, how they were injured (where appropriate), and the value of safety belts in their particular situation. Three of the testimonials were given by officers who had been spared injury by the use of restraints; all three had either walked away from their accident or received minor treatment for their injuries. Two officers' testimonials described situations in which failure to use a safety belt resulted in serious, disabling injury. These two testimonials dealt with the disabling injury and change in lifestyle associated with the automobile accident.

The video medium enabled easy, cost-efficient reproduction and dissemination of the information. The presentation of the five testimonials was interspersed with actual photographs or film footage of the post-accident scenes. This was done to ensure a lively flow of information during the videotape presentations.

Impact Experience

This third portion of the Instruction module was designed to allow participants to experience the impact of a simulated accident. Most people underestimate the physical force associated with an automobile collision. This phase of the program was based upon the hypothesis that accident experience would lead to motivation and the desire to use safety restraints. One component of the crash experience, impact, was isolated and presented to participants through the use of the "Convincer".

The Convincer is a device that affords users a simulated collision experience. Its gravity-powered slide operates much like a roller coaster. A stop at the end of the slide reproduces the deceleration associated with an 8-mph automobile collision. The device has proven itself in the past to

be a practical and persuasive tool in motivating the increased use of safety belts. The MSP obtained the portable Convincer on loan from the Maryland DOT. The device was transported to training locations to allow uninformed personnel at the appropriate facilities the experience of accident impact.

Incentive Module

The third element of the BUCLE program was the implementation of an incentive system to encourage safety belt use among agency personnel. This component of the program involved the installation of a device capable of revealing, under post-accident analysis, whether a seatbelt has been worn at the time of impact.

The device itself was little more than a fork-like device through which the safety belt was threaded. Relatively low speed collisions cause deformation of the device. In use, the 300 pound force necessary to bend the inner fork of the device could be generated in collisions involving closing speeds of approximately 12 mph, depending on weight of the occupants and the vehicle involved. Inspection of the device, after a collision of even moderate speeds, would allow deduction of whether the belt had been drawn taut with a significant force, and thus whether the belt had been in use at the time of impact.

The effectiveness of this module as an incentive to increased seatbelt use hinged upon troopers' beliefs that the device would serve as evidence in the disposition of cases involving MSP preventable collisions. MSP supervisors had informed all patrol officers, during the Information module, of possible sanctions for the non-use of restraints while operating agency vehicles. Commanders were also informed of both the design and function of the device and its handling as evidence in cases of MSP collisions.

METHOD

The overall objective of the BUCLE program was to increase safety belt use among MSP personnel. To get an accurate assessment of the effectiveness of the BUCLE program and its constituent modules, both knowledge/attitude measures and observational data were gathered. In addition, subjective evaluations were obtained to provide insight to trooper assessment of the Instruction module and its components.

Eight MSP field facilities were used for the evaluation of BUCLE. The facilities were both heavily-trafficked and within a relatively small geographic area to permit reliable and economical collection of data.

Evaluation Design

The eight facilities were divided into two treatment groups of four sites each. The facilities that participated in this study are listed below:

PARTICIPATING MSP FACILITIES

North (N) Group	South (S) Group
Valley	Rockville
Jessup	College Park
Security	Forestville
Bel Air	Waldorf

These facilities provided a total sample size of roughly 300 uniformed personnel, approximately 150 per group. The two groups received the three phases of the program in a different order to permit an evaluation of the separate phases. The order of module presentation is summarized below for each of the treatment groups:

Group N	Group S
Information	Information
Instruction	Incentive
Incentive	Instruction

The evaluation of program effectiveness took place through (1) surreptitious observation of seat belt use among agency personnel over the course of the program, and (2) administration of knowledge/opinion tests at three times during the course of the program. Comparisons of pre- and post-data allowed an assessment of the effect of the entire program, as well as its constituent components, in altering seatbelt use. The pre-post method enabled each barrack to act as its own control for purposes of the evaluation.

Knowledge/Attitude Tests

The knowledge/opinion measures consisted of 24-multiple choice knowledge, and 16-multiple choice opinion questions (see Appendix C). Knowledge questions centered upon the likelihood of agency personnel being involved in a traffic accident, the physical realities of an automobile collision and the value of restraints in reducing injury and cost. The opinion test questioned officers' beliefs regarding the benefits of safety belt use, the probability of automobile collision, and their responsibilities as civil servants.

The first knowledge/opinion tests were given during the developmental phase of the program, as a questionnaire that was completed during the agency-wide discussion session. The data collected during this phase of the program served as baseline measurements of both knowledge/attitude performance and pre-information module performance.

The second and third knowledge/attitudes data collections were made before and after the implementation of the instruction program. Knowledge/attitude measurements were not taken after the implementation of the incentive program, as this component of the course was not designed to alter either the knowledge or attitudes of agency personnel.

Observational Data

Seat belt use was observed by monitoring devices after the implementation of each module, at the entrance/exits of each of the eight facilities used for the evaluation of BUCLE. Data collection took place as a part of a program designed to evaluate facilities' security systems. No mention was made of the fact that safety belt usage was among the factors observed.

Direct observation of belt use was made impractical by the infrequency with which MSP personnel entered and left the facilities and the wide area covered by MSP while on duty. Photographic techniques were used instead.

Monitoring Devices

Two transportable camera devices were used for collection of the observational data. The cameras were triggered by electrical switches placed across the roadway. Each camera was focused upon the location of the switch so as to take a picture of the vehicle activating the switch. A photoelectric cell was placed in the camera activation circuit to prevent the camera from being triggered when the light was insufficient to yield a clear picture (i.e., nighttime and dark days). The camera was loaded with enough film to record observations of approximately 100 vehicles.

One of the cameras rotated among the northern group of facilities, while the other served the southern group. The cameras remained at their stations for three days, after which time the film magazine was replaced and the camera was moved to a new location.

The camera recorded both MSP and civilian vehicles both entering and leaving the facility. As will be noted later, civilian vehicles were used as a control group to permit changes in belt use due to such extraneous variables as weather or publicity concerning safety belts to be distinguished from those of the BUCLE program.

Data Reduction

Developed films were projected onto a reflective viewing screen for reduction. Each film contained a three-day record of vehicles entering and leaving the barracks during the daytime. The film was not sensitive enough to collect nighttime data. Each vehicle was shot in two-second sequences. These sequences were long enough and of sufficient resolution to allow detection of whether a passing vehicle's driver was using the safety

restraint. In some cases (usually due to excessive glare associated with a specific time of day) the film lacked sufficient clarity to allow determination of whether restraints were being used.

Data were reduced and tabulated according to (1) direction of travel, to allow later assessment of whether incoming or outgoing drivers were more likely to use restraints, and (2) type of vehicle, that is, whether the vehicle was an MSP patrol car or a civilian vehicle. It was not possible to identify individuals from the film assuring the anonymity of the subjects. The large sample size (over 1,600 observations) ensured that any observed changes in use rate were representative of the behavior of the entire group.

RESULTS

The results of the BUCLE evaluation involved use of the following three types of measurements:

- Knowledge/opinion measures
- Observational data
- Participant evaluations

Knowledge/Opinion Results

The obtained knowledge and opinion measures are shown in Table 1. The "baseline" results represent those collected before the program began, while the "post-information" and "post-instruction" results represent those obtained, respectively, following distribution of the informational brochure and completion of the instructional program.

TABLE 1
MEAN KNOWLEDGE AND OPINION SCORES
FOR BASELINE, POST-INFORMATION AND POST-INSTRUCTION PHASES

Knowledge Test

Test Administration	Mean Score		
	Group S N=165	Group N N=149	Combined
Baseline			13.4
Post-information	14.8	15.3	15.1
Post-instruction	18.3	19.0	18.7

Opinion Test

Test Administration	Mean Score		
	Group S N=165	Group N N=149	Combined
Baseline			36.6
Post-information	38.0	37.9	38.0
Post-instruction	40.9	41.3	41.1

Comparison of the baseline versus pre-information measurements reveals that the information component of the program produced slight improvements in both knowledge and opinion, across both groups of barracks. The results were significant for both knowledge and opinion ($P < .01$).

It is important to note that baseline knowledge and opinion measures were obtained during the focus group discussions from a sample of MSP personnel representing all barracks, and not just those from which the post-information and post-instruction scores were obtained. It is not possible to determine how much of the change was due to improvement in knowledge and opinion and how much due to differences in samples of people involved. Given the relatively small differences between Group S and Group N, it is unlikely that all of the improvement can be attributed to differences in subjects and at least some of it can be attributed to the benefits of the information program.

Results obtained from the instruction component of the program revealed a larger improvement in mean score than that produced by the information program. Larger gains are seen in both knowledge and attitudes. The differences were highly significant in both cases ($P < .01$). The amount of

change in both the S and N groups of barracks was roughly equivalent across both of the knowledge and opinion measurements taken, with the N barracks showing a slightly larger increase. The instruction program showed an increase in knowledge of approximately 15 percent, while opinion scores, across both groups of barracks, was raised by roughly 6 percent. While the differences do not seem like much in absolute terms, they amount to about 1.5 standard deviations. That is, the post-training group average score corresponded to the 90th percentile score of the pre-training group.

Observational Results

A total of 1,542 usable observations of belt use were made; 938 of these were identifiable as MSP patrol cars, 604 as civilian vehicles. From the filmed observations, it was not possible to identify the facility to which a vehicle was assigned. Therefore, some of the vehicles entering and leaving a facility might be driven by an officer from another facility. However, such crossovers would be rare; the overwhelming majority of individuals driving police vehicles into and out of a facility would be assigned to that facility.

As with the knowledge and opinion measures, data were collected during the baseline period, after the information brochure, and after the instruction program. Data were also collected after the introduction of the incentive device and after the total program; that is, information, instruction, and incentive device. Results given for the post-instruction phase were those obtained in the facilities where the post-instruction program was given before the incentive program. Similarly, the results for the post-incentive phase are those obtained where the post-incentive program was given first. The results given for the "Total Program" are those obtained from all participating barracks following completion of both the instruction and incentive program.

Observations were tabulated separately for vehicles leaving the facility and vehicles entering it. However, since the number of observations within each category was too small to permit meaningful comparisons, no breakdown is presented. Observed usage rates are summarized below across both categories of vehicles.

TABLE 2
OBSERVED USAGE RATES ACCORDING TO PROGRAM PHASE
AND DRIVER CATEGORY

Program Phase	Driver Category			
	MSP		Civilian	
	%	N	%	N
Baseline	20.7%	(212)	13.4%	(240)
Information	14.7%	(102)	11.7%	(92)
Instruction	18.9%	(55)	21.4%	(28)
Incentive	20.4%	(269)	13.3%	(134)
Total Program	42.3%	(300)	10.4%	(110)

These results represent the percentage of all drivers who were using safety restraints. MSP personnel displayed no significant increase in safety belt use through the information program, or through the incentive or instruction programs alone. However, when each group (S and N) had completed all components of the program, safety belt use increased approximately two-fold over the baseline period. In comparison, no increase was seen in belt use by civilians during the same time period.

It might appear as though the information and instruction programs resulted in a decline in safety belt use, since the percent of personnel wearing safety belts was below that of the baseline. However, the number of observations was relatively small during these periods, producing somewhat unstable percentages. The reduction in the number of observations was due primarily to problems with the monitoring equipment, resulting from adverse weather conditions.

Participant Evaluation

Participants in the instruction program rated each of its components on a scale of 1 to 5. The results appear in Table 3 below.

TABLE 3
PERCENT OF PARTICIPANTS IN INSTRUCTION PROGRAM
ASSIGNING VARIOUS SCALE CATEGORIES TO PROGRAM COMPONENTS
(N=314)

Scale	Components				
	Video	Slides	Discussion	Convincer	Total Program
5	67%	30%	18%	69%	57%
4	23%	36%	30%	22%	35%
3	9%	31%	35%	5%	6%
2	1%	3%	16%	1%	1%
1	0%	0%	1%	2%	0%

The most highly rated components of the program were the video testimonials and the ride in the convincer. Over two-thirds of the participants assigned these two components a scale value of "5". The total program was given a "5" rating by over half of the participants.

The group discussions were the most lowly rated, with approximately half of the group assigning it a scale value of "3" or below. The informational slide presentation fell in between the video and convincer on the one hand and the group discussion on the other.

It would be unwise to eliminate the group discussion on the basis of the ratings. With the proper foundation, group discussion can be a very powerful molder of attitudes. However, results point out the need to modify the group discussion format somewhat in order to lead to a more favorable reception.

DISCUSSION

The BUCLE program as a whole had a significant impact upon knowledge and attitudes toward use of safety belts as well as actual observed use. In the case of knowledge and attitudes, gains were obtained from both the informational and instructional components individually. In the case of observed use, however, a significant gain was observed only after all elements of the program had been applied. The results would appear to indicate that a successful safety belt use program within law enforcement agencies depends upon a combination of (1) policy requiring use of belts, (2) an instruction program designed to clear up misconceptions about safety belts and to present vividly the consequences of failure to wear them, and (3) a system by which use of safety belts in accidents can be accurately determined.

It is always possible, of course, that the increase in safety belt use resulted from factors outside the BUCLE program. One set of factors might lie entirely outside of the law enforcement establishment, such as changes in weather conditions or increased public awareness of safety belts (perhaps resulting from concurrent media coverage of mandatory safety belt legislation). Such factors would, presumably, have shown up in an increase in belt use by civilians entering and leaving the barracks at which observations were taking place. The fact that no such increase occurred suggests that the factors responsible for the increased use by MSP personnel were specific to the MSP.

A second set of factors would be those that are specific to the MSP but outside of the BUCLE program. The most obvious such factor would be the presence of the monitoring equipment. It is likely that many, if not most, of the MSP personnel were aware that the equipment was being used to monitor safety belt use, in addition to the announced purpose of obtaining information for security purposes. However, the equipment had been in use a full six months before the marked increase in safety belt use was noted. Certainly, personnel were pretty used to seeing the equipment by this time and any effect the equipment itself had upon safety belt use would have presumably been realized earlier.

The collection of data distinguished between use of belts leaving versus arriving at the various facilities. They are not presented separately due to the small numbers involved. During the period of low use, the percentages were almost identical for entering and leaving. However, during the period of high use, following administration of the complete program, use of belts leaving facilities was approximately 15% higher than that entering facilities. This difference may be due to a tendency for the facilities themselves to provide a reminder to buckle up. If true, many of the people who did not use the belts, both going and coming, may have simply forgotten to do so.

CONCLUSIONS

On the basis of the results obtained from evaluation of the BUCLE program, the following conclusions were reached:

1. Law enforcement officers hold a variety of misconceptions about, and unfavorable attitudes toward, the use of safety belts.

2. An instruction program consisting of information presentation, discussion, testimonials by law enforcement officers, and a convincer ride is well received by law enforcement officers. The testimonials and convincer ride are the most highly rated components of the program.

3. A program of information and instruction is capable of improving knowledge of, and attitudes toward, safety belt use.

4. Policy favorable to safety belt use, accompanied by information and instruction, as well as a means of identifying whether or not safety belts were in use when an accident occurred, is capable of yielding a significant increase in safety belt use.

EVALUATION OF THE BELT USE LAW

The evaluation of the BUCLE program showed a doubling of safety belt use through a combination of information, instruction, and incentives. Since belt use by Maryland State Police was originally observed, Maryland had enacted legislation making safety belt use mandatory for all vehicle operators in the State. Failure of police to wear safety belts was now a violation of State law as well as Departmental regulation. What effect State belt use law had upon safety belt use by law enforcement officers could best be assessed by observing belt use after passage of the law and comparing it with prior use.

METHODOLOGY

The methodology used to assess belt use after passage of the law was similar to that used in evaluating the BUCLE. However, some changes were introduced in observational techniques, sites, equipment, data collection, and data analysis.

Observational Technique

In the prior study, Super-8 photography was used to record belt use by MSP personnel in an unobtrusive manner. Cameras were mounted at entrances and exits to the eight police barracks involved in the study. While the use of Super-8 film proved acceptable, a fairly substantial number of observations could not be used because of the inability to tell whether a safety belt was in use.

In the evaluation of the belt use law, 35mm still photos were used. It was possible with the 35mm to maintain a field of view that was equal to that of several Super-8 frames and still have greater clarity. Moreover, the 35mm camera system was significantly smaller, and less obtrusive, than was the Super-8 system. Finally, with the NPSRI project offices having recently moved to Maryland, it was now feasible to replenish film daily, as required by the use of 35mm.

Observational Sites

The earlier study took place at eight sites, four of which were in the area north of Baltimore and four south of Baltimore (Forestville, College Park, Rockville, and Jessup). The observational sites had been the barracks at which the training program being evaluated was administered. For logistical and economic reasons, the current study was confined to the two barracks closest to NPSRI, College Park and Forestville. Since there had been no significant differences in use rates among the eight barracks in the earlier study, confining the observations to these two barracks should not bias the pre-post comparison.

Equipment

A 35mm camera with automatic focus and automatic film forwarding was used to photograph the safety belt use of officers. The camera was triggered by an electrical pressure switch taped across the road at the entrance and exit to the MSP barracks. A timing circuit introduced a minimum six second delay between successive shots to prevent the rear tires of a vehicle from triggering an unusable second shot.

A small, weatherproof box was fabricated to house the camera, timing circuit and power supply. The box was designed so that the camera could not be seen, and looked like a standard traffic counter. The box was mounted on a pole which placed the camera approximately four feet above the ground. This height allowed the camera to photograph the inside of a passing vehicle.

Data Collection

Data collection took place during the three-month period, June - August, 1987. At the beginning of each day, a research assistant visited each site to replenish film. The greater clarity afforded by the use of 35mm photography made it possible to monitor both incoming and outgoing traffic from one side of the roadway, eliminating the need to relocate the camera within a barracks during the data collection.

The previous study showed that the number of vehicles entering and leaving the MSP barracks averaged approximately 35 per day. Because of variation about this rate, there were occasions upon which the film supply was either exhausted before the end of the day or filming continued into the night. Early data revealed that the film supply was being exhausted long before the end of the day at the College Park barrack, owing to its high flow of traffic, and a second daily trip was initiated.

Data Analysis

Exposed film rolls were processed immediately in order that data could be analyzed on a continuous basis. This was necessary in order to determine which exposures were producing usable data and permit the collection of data to cease when the target of 1,000 usable observations had been reached. Prints of each photograph were reviewed independently by two members of the research staff. They were sorted into the following three categories:

Yes -- Those pictures in which a safety belt was clearly visible.

No -- Those pictures in which it was clear a safety belt was not worn.

?-- Those pictures in which it was not possible to tell whether a safety belt was being worn (glare, driver not visible, under- or over-exposed).

Agreement between the two individuals exceeded 95%. Only "yes" and "no" pictures in which they agreed were used in the analysis.

RESULTS

The percent of safety belt use by category of driver (police vs civilian) and direction of travel (in or out) is shown in Table 4.

TABLE 4

PERCENT OF SAFETY BELT USE BY POLICE AND CIVILIANS ENTERING AND LEAVING TWO POLICE BARRACKS

Driver	Entering		Leaving		Total	
	Percent	N	Percent	N	Percent	N
Police	92.3%	390	89.1%	267	91.0%	657
Civilian	55.6%	257	62.0%	79	57.1%	336
Both	77.7%	647	82.9%	346	79.6%	993

Overall, police were observed to be wearing safety belts 91% of the time. Civilians wore them less frequently, 57.1% of the time. The small difference between the use when entering vs leaving the barracks was statistically non-significant for either the police or the civilians.

The percentages in the table represent the best estimate of safety belt use. There were some 370 additional, unusable cases in which use of the belt could not be determined. These made up 23% of the police vehicles and 33% of the civilian vehicles. In most of the cases, the area in which a safety belt would appear simply was not visible. The percent of questionable cases was twice as great when the vehicle was viewed from the passenger's side as when it was viewed from the driver's side (33.9% vs 17.8%). In a few cases, the area in which a safety belt would appear was itself visible but those coding the data simply could not agree as to whether the belt was in use. There is no reason to believe that the actual belt use rate among those who could not be clearly observed was any different from that among those whose results are presented in the table. None of the factors that prevented observation of belt use would have biased the results in one direction or the other.

The earlier study had shown negligible differences among barracks in extent of safety belt use by police. For this reason, only two sites were used in the present study, thus saving considerably on the costs of equipment installation and data collection. Again, the differences in use rate by police were negligible, 89.2% at one site and 92.1% at the other. While a more sizeable difference emerged among the civilians, 53.5% vs 61.7%, the smaller number of cases led to greater chance fluctuations. The difference was still statistically non-significant ($x2 = 2.43$; $p>.10$). It

is noteworthy that the site exhibiting the higher use rate by civilians was restricted to authorized vehicles. It is entirely possible that some of the "civilians" were actually off-duty officers.

The fact that observations of entering vehicles greatly exceeded observations of vehicles leaving results from the camera position and does not reflect the numbers of vehicles actually entering and leaving--which is obviously equal. The camera was positioned so that it was on the driver's side for entering vehicles and the passenger's side for departing vehicles, thus producing more usable observations among entering vehicles.

DISCUSSION

It is very evident that passage of a safety belt law, accompanied by an intensive safety belt training program, produced a sizeable increase in use of safety restraints by police officers. Use rate following training and passage of the law was slightly more than double the 42% use observed prior to passage of the law, despite the fact that belt use was required by departmental regulation before it was covered by State law.

Whether the same high level of use observed after passage of the law would have been obtained in the absence of the extensive training that was given cannot be determined. Since the training programs were administered throughout the MSP, there are no groups covered by the law who were not previously exposed to the program. In any case, the combination of belt use training and a State law requiring belt use produced over a four-fold increase (21% to 91%) in the use of safety belts among law enforcement officers.

It is quite likely that some portion of the drivers suspected the "traffic counter" was in reality a camera. Such insight would be more prevalent among the police, who made more repeat trips and observed the camera more often. However, the fact that not all police were found to wear safety belts indicates that sizeable numbers either did not recognize the counter as a camera, or did so and still chose not to wear safety belts. While possible recognition of the camera may have inflated the use rate somewhat, it did not inflate the differences between the use rate prior to passage of the law and that observed afterward since the same suspicions would presumably have prevailed in the earlier study as well. It is clear that passage of a safety belt law, while not leading to universal use of safety belts among law enforcement officers, produced a sizeable increase.

Just what brought about the marked increase in belt use by Maryland State Police was not readily evident. They were required to wear safety belts prior to passage of the law. However, the requirement was a departmental regulation rather than a State law. While the regulation was not strictly enforced, neither was the law as far as enforcement officers are concerned. Perhaps a more likely explanation lies in the reluctance of police to be observed violating a State law. Even officers who do not consider themselves to be role models when it comes to adhering to safety

practices can recognize the extent to which law enforcement efforts can be undermined by the failure of those enforcing the law to themselves comply with it.

While it is somewhat tangential to the objectives of the study being described, it is worth noting that belt use rose significantly among civilians as well as police. Average belt use by civilians entering the police barracks was only 10% prior to passage of the law contrasted with the 57% found in the present study. While the populations entering and leaving police barracks are not necessarily representative of the general driving population when it comes to belt use, there is no reason to believe that the change in belt use is unrepresentative of Maryland drivers in general.

A number of States exempt police from compliance with safety belt laws. There is no practical defense for this exception. Use of safety belts in no way interferes with enforcement of traffic law, but rather offers protection to a category of drivers whose risk of injury is greater than that of the general public. The exemption is probably attributable to a tradition of excepting police from traffic laws and leaving it to enforcement agencies to decide what is appropriate practice. The Maryland experience makes it clear that laws requiring police officers to wear safety belts do have a positive effect upon belt use.

CONCLUSION

Based upon the results of this evaluation, we may conclude that passage of a State safety belt use law that does not exempt police from its provisions, coupled with extensive training, is capable of leading to greater use of safety belts by police. A sizeable increase can be obtained even where a prior increase in belt use was achieved through a safety belt information, instruction, and incentive program. A combination of the program and the law is capable of leading to belt usage among law enforcement officers in excess of 90%.

Everyone has a big stake in keeping you on the job. Each of you took about a year to train at an estimated cost of $50,000. The experience you've gained as a trooper is priceless. You are a specialist! A unique professional!

You're not easily replaced! Lots of people depend on you and some who depend on you are very close to you. If you are killed or injured:

- Who will take care of your family?
- Who will do your job?

Wearing a safety belt is MSP policy. Safety belts are a part of the important equipment that troopers use for survival.

The agency wouldn't think of sending you out without your vest, sidearm, or other equipment. You're too valuable not to wear a safety belt every time you drive.

WHAT ARE TROOPERS' CHANCES OF HAVING AN ACCIDENT?

Unfortunately, they're pretty high. The accident rate for MSP personnel is comparable to that of "young drivers" as a group, about 9.5 per million vehicle miles. That compares to a figure of about 4.1 for all other drivers.

In fiscal year '83-'84, over 9% of the accidents for our agency involved trooper injury—up from 6.4% the previous year. More than 900 off-duty days resulted from these accidents in 1983 alone. For an additional 300 days, troopers were assigned light duty—on the job, but not able to perform regular assignments. Last year, the "lost" time alone

cost our agency over $100,000. Each year, there are other losses as well—family adjustments, human suffering, and medical expenses.

WHY THE HIGH RATE?

Driving conditions are a factor. Troopers have to be on the road in even the most dangerous conditions. However, you might be surprised to learn that high-speed pursuit driving is seldom involved in MSP accidents.

The causes of accidents are so varied that not much can be done to reduce the accident rate. The *injury rate* is another matter. Safety belt use will reduce the injury rate.

HOW EFFECTIVE ARE SAFETY BELTS?

MSP can lower its injury rate. The average figures coming out of safety belt studies look like this:

- Safety belts can cut the number of serious injuries received by 50%.
- Safety belts can cut deaths by 60 to 70%.

The lap and shoulder combination, used properly, is most effective. Whether you are going 25 or 75, you're a lot safer wearing a safety belt. And, since the MSP accident rate is more than twice that of other adult drivers, troopers have even more of a reason to wear belts. Also, your use of safety belts will be contagious. Motorists will follow your lead.

HOW DO SAFETY BELTS WORK?

What happens if you're responding to a call and you crash into an object at just 30 mph? First, your cruiser hits the object, crumbles up and then stops. Unbelted, you would continue to move forward inside the vehicle at 30 mph. Even at that speed, you'd be thrown forward with the same force as if you had jumped head first from a three-story building.

Belted, you would begin to slow with the cruiser. Your safety belt would "catch" you and protect you. The belt would expand slightly (absorbing some crash energy) and the forces of the crash would be distributed to the stronger parts of your body.

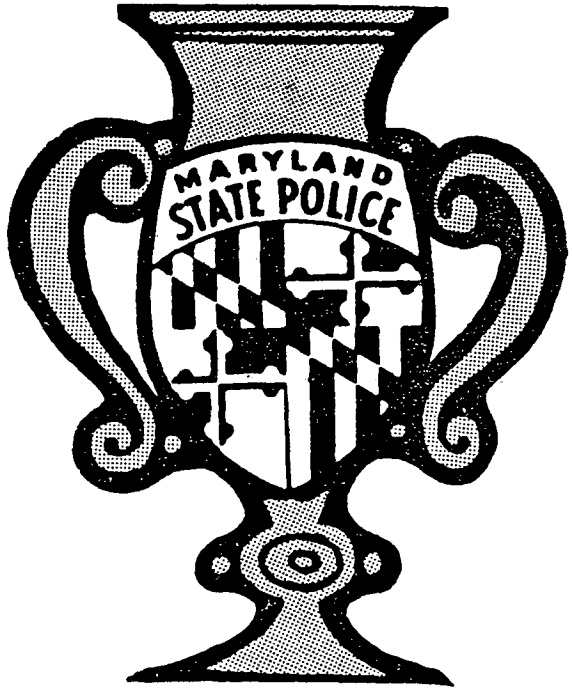
Safety belts also help you control your vehicle. In a side collision, you will be

thrown sideways toward the point of impact. Your belt keeps you behind the wheel, so you can continue to steer—and avoid a second collision.

Safety belts don't have to be tight to do the job. They move with you and give you the flexibility to reach your weapon or other things you might need. They've come a long way in comfort, too.

WEAR YOUR SAFETY BELT
EVERYONE NEEDS YOU! . . .
YOU'RE A MVP.

MVP



MARYLAND'S VALUABLE POLICE

APPENDIX B

MARYLAND'S VALUABLE POLICE: SAFETY BELT SURVIVAL PROGRAM

TRAINING PROGRAM OVERVIEW

The purpose of this safety belt training program is to protect a valuable commodity. The goal is to increase belt usage among uniformed personnel of the MSP and thereby reduce personal suffering and loss to the agency (e.g., lost time, pay, recruitment expenses, training expenses). The training program requires approximately 3 1/2 hours to deliver. Two trainers participate in the delivery of each session. The training program provides an informational, emotional, and physical experience to achieve its ultimate objective of increased belt use and injury reduction. The selection of informational, emotional and physical experiences as the basis for training program development was founded on prior research findings.[1] In this NHTSA research, informational, emotional and physical programs were assessed for their individual potential. With young drivers, elements of each of these programs were effective. In the MVP program, elements from each of the programs were selected and materials were designed to support the instruction.

Training Program Activities

The training program consists of six activities. The activities, contents, and instructional time for each activity are discussed in this section.

1. Introduction and Testing--A pre-test consisting of 24 informational items and 16 belief items is administered. After the test the safety belt progam is introduced.

   This activity requires approximately 15 minutes.

2. Testimonials--A presentation of crashes by uniformed personnel including the nature and extent of injury/ lost time.

   The testimonial presentation takes approximately 30 minutes.

3. Presentation--The presentation component involves 2 activities:

   -- Brief factual presentation on the value of safety belts

   -- Survey of MSP experience

   The presentation takes approximately 45 minutes.

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[1] McPherson, Kenard; McKnight, A. James; and Weidmen, James R. Supplemental Driver Safety Program Development: Final Report, Vol. I, Developmental Research and Evaluation. Prepared for DOT/NHTSA under Contract No. DOT-HS-9-02284, February 1983.

4. Discussion (Myths)--A discussion of reasons for safety belt use/non-use.

   The discussion of beliefs takes approximately 20 minutes.

5. Physical Experience--Actual ride on a convincer (sled) demonstrating the effectiveness of safety belts in low-speed operations.

   The physical (convincer) ride takes approximately 45 minutes.

6. Wrap Up--Administering a post-test (same as pre-) and dealing with the "final" thoughts of class members.

   The wrap-up requires approximately 25 minutes.

A three-hour time block will accommodate the instructional activities in this program. However, it is recommended that the program be scheduled over a 3 1/2 to 4 hour period to provide for breaks in instruction and prevent the premature termination of effective instructional activities in a particular session because of limited time.

Training Media and Equipment

Most of the instructional activities use a supporting media to accomplish the objectives. For example, print materials must be provided in Activities 1, 4 and 6. Answer sheets and test forms must be provided in sufficient numbers to meet the class enrollment. One test form and two answer sheets are needed for each trainee. Also, trainee handouts must be provided for the discussion in Activity 4. Three handouts are provided. They are provided in equal quantities to correspond to group size assigned in the activities. Media required in other activities is as follows:

- Testimonial and Discussion (Activity 2)--is represented through a 3/4-inch videotape and requires appropriate video playback equipment and a monitor.
- Factual Presentation (Activity 3)--uses 2x2 slides to focus attention on major content items.
- Survey of MSP Experience (Activity 3)--utilizes 2 x 2 slides and requires a 35 mm projector.
- The Physical Experience (Activity 5)--requires a convincer sled (in this case, a convincer was made available by the Maryland Department of Transportation).

Instructional Methods

Instructional methods employed in this program were selected in terms of their appropriateness to the instructional activity. In general, presentation, discussion and hands-on experience methods are employed. Specific instructional techniques are included in the lesson plan portion of this training program guide.

Training Program Objectives

The overall goal of the training program is to increase safety belt usage and thereby reduce loss (resulting from injuries) to troopers, their families, the agency and the State of Maryland.

The following are set forth as performance objectives for the program:

- Troopers use safety belts under all driving conditions.
- Troopers encourage other motorists to utilize safety belts.
- Troopers promote belt use when meeting the public, individually or in groups.

The following are set forth as knowledge objectives for the program:

- Knows the benefits from safety belt use.
- Knows and understands myths about not using safety belts for what they really are--myths.
- Knows that risk of injury can be cut by safety belt use regardless of the duty assignment.

The following are set forth as attitude (belief) objectives for the program:

- Believes safety belts are as important an equipment item as any other equipment issued to carry out law enforcement activities.
- Believes safety belt usage on all trips is essential to an officer's survival.
- Believes troopers can have a positive influence on motorists' use of belts through the troopers' "model behavior" or use.

LESSON PLAN

INSTRUCTIONAL ACTIVITY I--PRE-TEST AND INTRODUCTION

As soon as the class roster of participants is confirmed, the pre-test should be passed out. Members of the class should be briefly welcomed and asked to complete the test as quickly and as accurately as possible. Further, class members should be asked to notify the instructor when they have completed the test form. The instructor checks the answer sheet to make sure that answers to questions are not omitted and that only one answer is given for each question.

Introduction

Administrative

- Class takes 3 1/2 hours
- Two breaks (10 minutes each) are given.

Course Experience

- Viewing of a film
- Presentation and discussion
- Safety belt use experience (Convincer ride)

Content

- Program addresses the most important piece of safety equipment used by the State police trooper.
- It is the only piece of safety equipment that is available to every motorist, whether trooper or civilian--a safety belt.
- It is more likely to save the trooper's life than any weapon issued by the agency.
- A high level of restraint usage by troopers is necessary for several reasons:

  --To protect the trooper and his family.

  --To help the MSP by keeping highly qualified people on the job.

  --To help citizens by providing highest quality of law enforcement protection.

  --To help drivers by setting a model for all citizens, young and old.

INSTRUCTIONAL ACTIVITY II - TESTIMONIAL AND DISCUSSION

Introduction to Testimonial

- o Testimonial covers five MSP troopers.
- o Three of the Troopers are still on duty/ Two are retired because of their accidents.
- o Safety belts made the difference in these crashes.
- o Service of two young troopers has been totally lost.
- o Everybody lost in this situation--the troopers, their families, the MSP, and Maryland citizens.
- o As you watch this program, think about why you really need safety belts; more importantly, why everyone needs you to wear safety belts.

Show Video Tape

(BREAK)

INSTRUCTIONAL ACTIVITY III--PRESENTATON

This instructional activity is divided into two sections. They are: Factual Presentation and MSP Survey Experience.

Safety Belt/Factual Presentation

	Slides
o How many of you have had a collision?	1. Crash
o How many have been shot at?	
o Review agency policy, experience with fatals (traffic/other)	
o Safety belts have two major values:	
(1) They reduce the likelihood of injury	
(2) They help the driver maintain control of the vehicle [1]	
Safety Facts	
o One out of every two drivers is likely to be involved in a serious accident during their lifetime.	2. Troopers
o One in 5 drivers have an accident each year.	
One in 3 troopers have an accident each year and 1 in 7 are injured.	
o Safety belts, if used by all drivers, could reduce fatal accidents by at least half, and injuries by at least two-thirds.	3. Data
o Safety belts are effective at high and low speeds alike. Drivers don't have to be moving for the belt to be effective; they could be stopped (e.g., writing a citation).	4. Speed
o They are designed much like all other vehicle parts which absorb energy during a crash.	5. Crash
MSP Experience	
o The MSP (in 1980) experienced over 350 agency vehicle collisions.	6. Data
o Of the 350 accidents involving agency vehicles, 38 resulted in injury to agency personnel.	
o More than 900 work days were lost.	

(continued on next page)

[1] Training in evasive maneuvers demonstrates inability of unrestrained drivers to stay behind the wheel even in low-speed maneuvers.

	Slides
MSP Experience (continued)	
o These lost days (900) means that Maryland citizens lost the benefit of more than 3.5 manyears of MSP protection and service. This short-term loss (i.e., within a year) doesn't cover loss from long-range or permanent disability.	6. Data
Police Need for Belts	
o The more likely one is to be involved in an accident, the more they need to use safety belts.	
o Because of the driving experience and exposure, State troopers have a high accident rate (equal to young drivers).	7. Traffic scene
o Because of this high accident rate, State Troopers also need to wear safety belts more than other driving populations.	
o By comparison, Maryland State Troopers are involved in twice as many accidents as Maryland and the nation's drivers as a whole.	
o For example, the accident rate for drivers is 4.1 per million vehicle miles -- the MSP rate is 9.5 per million vehicle miles.	8. Data
o Estimates of use for the motoring population range from 10% to 20%.	9. Percentage arrow
o Estimates of use for Maryland police agencies is about 30% (MSP estimate is about 25%).	
o While the police experience is better than that of the general public, it is far from adequate in terms of potential loss to everyone involved.	
o While we as troopers cannot change our driving experience (make it easier or less demanding), we can increase our chance of survival by using safety belts.	

	Slides
o Type of crashes troopers should keep in mind are frontal and low speed --More than half of all traffic deaths and serious injuries occur in frontal crashes. --More than 90% of the victims are front seat drivers (the only place an on-duty trooper would be riding). --Half the crashes occur at low speeds (speeds below 35 mph) --Crashes at 35 mph will severely injure unrestrained front seat passengers most all the time	10. Frontal crash
Human Crashes	
o In a crash, there are really two crashes: (1) the collision of the car against another object, and (2) the collision of the occupants with the inside of the car. --It is the second collision of the occupants inside a car that kills and injures. --At 35 mph when a car hits a barrier, it comes to a stop in 1/10th of a second. --The occupant unrestrained continues to travel at 35 mph until striking the inside of the vehicle. --The front end of the car will be crushed about 2 feet in its effort to absorb the crash energy.	11. Front-end crash
--The unrestrained occupant (body, skeletal figure, muscle structure, etc.) if unrestrained also has to absorb the equivalent crash forces.	12. Inside vehicle
Belt Value	
o The trauma caused by traffic crashes is preventable and the solution takes only a second or two (e.g., one second to buckle a restraint)	
o Safety belts can make a real difference, if they are worn properly.	

(continued on next page)

	Slides
Belt Value (continued)	
o If both the belt and the shoulder strap are used (with the shoulder strap in front), safety belts can help you in several ways.	13. Belted officer
(1) It can help you maintain control of the vehicle in a sudden swerve likely to occur in pursuit driving.	
(2) They can reduce fatigue that occurs over hours of long driving.	
(3) And they can prevent injury in a crash by:	
--helping the occupant "ride down" the crash by beginning to stop the occupant as the car is stopping --Preventing the occupants from colliding with the dash, steering wheel, etc. --Spreading the forces of the impact across the stronger parts of the body (not the head and neck and the windshield or chest on the steering wheel). --Preventing occupants from hitting each other --Preventing occupants from being thrown outside the vehicle. (Occupants thrown from the vehicle are 25 times more likely to be seriously injured or killed.)	
o A high safety belt use rate is also valuable to the police in:	
--supporting public information and education campaigns to increase safety belt use among the driving public; and	14. Belted civilian
--reinforcing the public's perception of the State Police as model safe vehicle operators.	

Slides

Summary

Use both the lap and the shoulder belt and use them correctly. The lap belt alone is helpful. It has the potential to reduce death and injury by 30%, however, the lap and shoulder belt in combination have a potential to reduce deaths and injuries by 60%. The effectiveness of these figures hold true for all types of crashes. For example, NHTSA's Tow-Away Study (1976) showed effectiveness for impact area as follows:

Rear - 50%	15. Crash
Front - 55%	16. Crash
Side - 60%	17. Crash

- o Seat belt users in side crashes are more likely to survive than unbelted users. Belted drivers are not "crushed" on impact nor are they thrown around in the vehicle.
- o And safety belts are perhaps most effective in roll-over crashes.

  --injury usually occurs from being tossed around in the vehicle (broken necks and injured spinal cords are frequent), and

  --being tossed outside the vehicle and rolled over on by the car.

- o Belted passengers usually escape these injuries entirely. (A Michigan study suggests that safety belts may be nearly 100% effective in preventing head and neck injuries in roll-overs.)

Survey of MSP Experience

This exercise presents several case studies, all involving MSP personnel. The objective of this exercise is to demonstrate that the MSP has an accident prolem. The solution to the problem is to wear the belts. Secondary objectives are to:

1. Demonstrate inconsistencies in investigation.
2. Demonstrate that lack of belt usage increases injury.
3. Demonstrate that belts should be used in all police/traffic work--even when the vehicle is parked.

SAFETY BELT CASE STUDIES

Case #1, July 27, 1984, 1850 hours

Rear end - belted uninjured

On July 27, 1983, at 1850 hours, our vehicle was proceeding east and failed to observe a vehicle which was stopped, preparing to make a left turn. Our vehicle struck that vehicle in the rear. The operator of the MSP unit was restrained. However, the three passengers in the vehicle were not restrained and all received injuries as a result of the collision. Damage to our vehicle was approximately $3,000. Weather conditions: daylight, clear and dry. No view obstructions.

Case #2, May 15, 1983, 2130 hours

Belts prevented severe or fatal injury

On May 15, 1983, at 2130 hours, our vehicle was westbound responding to an emergency call for police service. While traversing a roadway curve, the operator lost control of the vehicle, subsequently striking a utility pole. The operator of the MSP unit was restrained. Injuries, however, were received which included a contused left knee, sprained ankle, and strained back. Damage to our vehicle was approximately $3,500. Weather conditions: night, rain, wet roads. No view obstructions. Loss of days due to injuries: 15.

Case #3, April 3, 1983, 1835 hours

Agency can afford loss to vehicle ($1,600), but can't afford loss of good personnel

On April 3, 1983, at 1835 hours, our vehicle was southbound in pursuit, with emergency lights and siren activated. A vehicle ahead braked suddenly and moved toward the shoulder. Our vehicle braked and slid into the rear of the vehicle. Operator of MSP unit was restrained and received no injuries. Damage to our vehicle approximately $1,600. Weather conditions: daylight, clear, roads dry. No view obstructions.

Case #4, March 25, 1983, 2300 hours

If second collision (human) occurred, given forces inside vehicle, serious injury would have resulted.

On March 25, 1983, at approximately 2300 hours, our vehicle was westbound preparing to make a left turn. A vehicle attempted to pass the patrol car and, upon realizing the situation, pulled back into lane striking the rear of our car. Operator and passenger in MSP unit were both restrained and neither suffered any injuries. The front seat of the MSP unit was completely broken loose from the floor pan and the occupant restraints still functioned correctly. Damage to our vehicle approximately $2,700. Weather conditions: night, clear, road dry. No view obstructions.

Case #5, February 27, 1983, 0400 hours

On February 27, 1983, at 0400 hours, our vehicle was northbound on Interstate highway when operator fell asleep at the wheel, ran off the roadway striking a parked and unattended motor vehicle. According to MAARS report, restraint was in use. However, windshield indicates otherwise. Operator received facial lacerations, loss of four days due to injury. Damage to our vehicle approximately $650.00. Weather conditions: night, dry, clear, street lights on.

Obvious head injury resulting from non-belt use. Future investigations will rely more on physical evidence than verbal reports.

Case #6, January 22, 1983, 2130 hours

On January 22, 1983, at 2130 hours, our vehicle was proceeding eastbound on U.S. Route when another vehicle exited a parking lot after committing a crime. This vehicle attempted to go west in the eastbound lanes. Our vehicle attempted to avoid; however was struck by the other vehicle. Operator of MSP unit was wearing his occupant restraints and suffered head injuries. A loss of four days from injuries resulted. Damage to our vehicle approximately $3,700.00.

Report is inconsistent. Head injury as primary injury is unlikely when belted.

Case #7, September 28, 1983, 2350 hours

On September 28, 1983, at 2350 hours, our vehicle, proceeding east on county route and upon negotiating a curve, crossed the center line and struck a vehicle which was proceeding westbound. According to MAARS, the operator of MSP unit was making use of restraint systems; however, injuries were incurred to the nose, jaw and chest. Loss of time from these injuries was 4-1/2 days. Damage to our vehicle: total loss.

Spider indicates possible misuse of the belts.

Case #8, February 15, 1983, 1230 hours

Our vehicle was northbound on U.S. Route responding to assist at a traffic accident. Upon entering a controlled intersection, the trooper activated his portable dome light in order to proceed through. Once in the intersection, our vehicle was struck by a crossing vehicle. Operator of MSP unit was making use of occupant restraints and was uninjured. Damage to our vehicle: approximately $1200.00.

Belts effective on side impact. They don't trap you, they protect you.

Case #9, January 6, 1983, 0715 hours

On January 6, 1983, at 0715 hours, our vehicle was southbound on U.S. route when vehicle in opposing lane crossed the center median and collided with our vehicle. Operator of MSP unit was making use of occupant restraints; however, did receive a strained neck and back. Lost time from injuries accounted for 13 days off. Damage to our vehicle: approximately $3,000. Weather conditions: previous snow, icy roads.

According to the investigation, belts were in use. What do you think?

(BREAK)

INSTRUCTIONAL ACTIVITY IV - DISCUSSION OF TROOPERS' BELIEFS

Presentation

Present the following ideas to the class:

- o Troopers do not use safety belts for many and varied reasons
- o Some say they forget, others give more substantive reasons:

  --Interference with job performance

  --Hazardous conditions

  --Discomfort

Discussion

A. Myths

Break the class down into three smaller groups. Appoint a group facilitator. Each of the three small groups should discuss reasons for wearing or not wearing safety belts. Record the reason and assign one person to report to the class when the instructor so indiciates.

About 10 minutes should be allowed for the discussion and 5 to 7 minutes allowed for the report back from the groups.

B. Forces

After feedback from the groups, the instructor discusses how the inertia reel works (a common myth is that it is loose and doesn't work). Also crash forces are discussed.

INSTRUCTIONAL ACTIVITY V - CONVINCER EXPERIENCE

Two instructors are required. One acts as the Master instructor and the other acts as the operator of the "convincer".

Introduction (To be given in the class and reinforced at the convincer location).

- The seat belt convincer demonstrates the forces involved in a low speed (e.g., 10 mph) crash.
- You will be able to feel these forces and experience the protection of a properly used and adjusted safety restraint.
- As each of us ride the sled, the remainder of us will be watching for the following:

  --Head snapping forward

  --Arms and hands flying forward

  --Bulge around the belts at impact
- As you observe, look for only one of these actions at a time because the sled stops in 1/10th of a second. You will have an opportunity to see each of these things as different members of the class take a turn.

Instructor Procedures

- Give the Introduction.
- Position trainees (waiting to ride) so that they can have a clear view of the convincer sled and rider.
- Maintain this positioning as trainees take their turn.
- Ask for a volunteer to be the first rider. Then, have each trainee ride. Exceptions would be people with bad backs or on light duty assignment for some reason.
- Point out what is happening to the occupant and why (e.g., head snapping forward)
- Discuss what the belt is doing (how fast an accident occurs) and the two-collision concept.
- Address the fact that they are observing a simulated, low-speed crash, and that most accidents occur on short trips and at low speeds.
- Elicit comments from some of the trainees who have just finished riding the convincer (for the benefit of the class).

- o Keep the group's attention on the activity at hand and on the utility of wearing safety belts.

- o After all have ridden, assemble the group and check their perception of the need for using safety belts.

These instructional procedures are carried out at the location of the convincer sled during the time that trainees take turns riding the convincer. One instructor is responsible for this level of "teacher/communication" while the other instructor is responsible for the actual operation of the sled. Importantly, trainees' attention is focused on this activity in order to gain the maximum instructional benefit. Also, all trainees, with exception of those with health problems, should be required to experience the convincer ride. (A mere demonstration by a trainee or two would be an insufficient learning experience.)

Operator Procedures

The operating procedures for a specific convincer sled should be followed. The sled's exact procedures should be supplemented by the procedures below:

- o Raise seat: trainee enters the sled at the top of the run.

- o Trainee should remove glasses, hat, etc., and items that may be at the belt line, including their weapon belt, and to position himself in the seat looking forward as if he were a passenger in a vehicle. Trainee should fasten and adjust the seat and shoulder belts.

- o Seat belt adjustment should be around the lower hips (e.g., just below the belt buckle) and the shoulder belt should allow for a clinched fist to be placed between the belt and the body.

- o Instructor should check the belt connections and adjustment.

- o The trainee should relax and place the lower arms and hands on the tops of the thighs.

- o The instructor should remind the trainee to ride with a closed mouth.

- o The trainee should inform the instructor when he or she is ready to crash.

INSTRUCTIONAL ACTIVITY VI - WRAP-UP AND POST-TEST

The trainees are administered the same knowledge and belief test questions that were used in the pre-test instructional activity. Additional answer forms must be available for use with the test forms. As in the pre-test administration, test forms are checked. When all trainees are finished with the post-test, and test forms and answer sheets are accounted for, an open discussion is conducted as a wrap-up. During this wrap-up trainees are permitted to ask any question that may be on their mind about safety belt use or the training program they have just experienced.

Also, training staff review the MSP policy and sanctions (outlined in the information program) regarding belt usge.

STUDENT HANDOUT

REASONS GIVEN FOR NOT WEARING SAFETY BELTS

INTERFERENCE

This was the most commonly given reason for not wearing safety belts. The objections took the following forms:

"Can't get out quickly"--This was the most common reason given. In the case of an emergency, officers wanted to be able to get out of the vehicle quickly and felt that the time taken to release the safety belt prevented a quick exit.

"It's inconvenient getting out"--In addition to interfering with a quick exit, safety belts were thought to be a considerable inconvenience to officers who have to keep getting in and out of the vehicle. It was "just one more thing to do" along with getting their citation books and putting on their hats.

"Catches on the gun"--Many claimed that the belt caught on the handle of the gun, increasing the time it took to disconnect the belt.

"You lack total control"--The various forms of interference gave some participants a feeling of not being able to respond quickly to any situation and, therefore, of not having "total control."

"You can't reach things"--Many felt that safety belts would inhibit their ability to reach the glove compartment, radio, and so on.

STUDENT HANDOUT

REASONS GIVEN FOR NOT WEARING SAFETY BELTS

HAZARD

Many officers felt that wearing safety belts was more hazardous than not wearing them, at least under certain circumstances. In this respect, their opinions parallel those of the public at large. Opinions voiced included the following:

"Keeps you in the vehicle"--This opinion was not totally a reflection of the common misconception that it is safer to be ejected from a vehicle than being held in it. Rather, it was based upon experiences in which it was necessary to cut the safety belt in order to remove a passenger from a vehicle after a crash.

"It holds you at the point of impact"--A number of officers expressed the opinion that, in a left-side impact, the safety belt would hold the driver at the point of impact. They appeared to believe that, if they were unrestrained, they would be thrown across the seat. (In reality, they would move toward the point of impact rather than away from it.)

"I don't trust the inertial reel"--Several officers expressed a lack of confidence in the inertial reel. They felt it simply wouldn't work in an accident. If this were the case, there would be no point in putting up with the "interference" and "discomfort."

"It causes the head to snap"--One officer expressed the opinion that, in an accident, it is better for the entire body to move than for the body to be held in place and the head to move. In short, they attributed whiplash to wearing a safety belt.

"You can't duck if you're shot at"

STUDENT HANDOUT

REASONS GIVEN FOR NOT WEARING SAFET BELTS

DISCOMFORT

Discomfort was the most frequently given reason for failing to wear safety belts, although it was not advanced as the most important reason. Specific causes of discomfort were:

"It catches on the badge"--If pulled tight, the shoulder harness can catch in the badge. When asked if this could be ameliorated by loosening the harness somewhat, most felt to do so would be to defeat the purpose of the harness.

"It cuts off circulation"--Many felt that prolonged wearing of safety belts, particularly lap belt, cut off circulation and led to fatigue.

"It nolds you to the seats"--Many complained about the "cheap vinyl" seats and some of the vehicles caused them to perspire. Being neld to the seat by the safety belt only aggravated the problem.

APPENDIX C

KNOWLEDGE/OPINION MEASURES

Knowledge Questions

1. In a high-speed pursuit situation, if an emergency maneuver is required, safety belts will:

   a. Make it difficult to steer.
   b. Have no effect on steering.
   c. Help you steer the car.

2. In a crash, you first move:

   a. Away from the point of impact.
   b. Toward the point of impact.
   c. At right angles to the point of impact.

3. Safety belts:

   a. Help only if you crash.
   b. Can prevent crashes
   c. Cannot prevent crashes.

4. The chances of being severly injured in an automobile accident in one's lifetime are:

   a. One in two.
   b. One in ten.
   c. One in 100.

5. Based upon accident rates, who needs safety belts the most?

   a. Police officers.
   b. Commercial vehicle drivers.
   c. Passenger car drivers.

6. Safety belt use can reduce the number of severe and disabling injuries by about:

   a. 10%.
   b. 50%.
   c. 90%.

7. Safety belts are designed to:

   a. Hold the occupant rigid and away from the crash force.
   b. Absorb some of the crash force.
   c. Eliminate the crash force.

8. Which statement is true about occupant injury in typical crashes at speeds under 30 mph?

   a. Injury from using belts is greater than that caused by the crash.
   b. Injury from using belts is less than that caused by the crash.
   c. Injury from using belts is the same as that caused by the crash.

9. In crashes at speeds between 20 and 30 mph, it is most likely that unbelted drivers:

   a. Will be able to brace themselves and avoid injury.
   b. Will not be able to brace themselves or avoid injury.
   c. Won't be injured whether they brace themselves or not.

10. More than one-half of the accidents resulting in injuries occur at speeds:

   a. Above 50 mph.
   b. Between 45 and 50 mph.
   c. Below 40 mph.

11. In crashes, <u>most</u> injuries to the driver result from:

   a. Hitting the interior of the vehicle.
   b. Being thrown from the vehicle.
   c. Buckles and webbings of the safety belt.

12. In an average year, the number of licensed drivers who have accidents is about:

   a. 1 out of 5.
   b. 1 out of 12.
   c. 1 out of 20.

13. Most of the injuries occur:

   a. At speeds over 50.
   b. At speeds between 40 and 50.
   c. At speeds under 40 mph.

14. Which statement is correct about the accident rate of Maryland State Police officers?

   a. They have a better rate than other drivers.
   b. They have a worse rate than other drivers.
   c. They have the same rate as other drivers.

15. In on-duty accidents, high-speed pursuit driving is responsible for:

a. Most motor vehicle accidents involving police.
b. Many motor vehicle accidents involving police.
c. A few of the motor vehicle accidents involving police.

16. A State trooper is most likely to be injured or lose his life through:

a. Making a traffic arrest.
b. Making a criminal arrest.
c. Crashing in a motor vehicle.

17. Which of the following statements about safety belt use is true?

a. They help keep you in total control of the vehicle.
b. They keep you from getting out of the vehicle quickly.
c. They keep you from reaching things in the vehicle.

18. Which of the following statements about safety belts and an officer's duties is true?

a. They interfere with an officer's duties.
b. They are most likely to interfere when the officer is in a hurry.
c. They have no effect on the performance of most of an officer's duties.

19. In a typical on-duty crash, being thrown from a vehicle:

a. Increases the chance of injury.
b. Decreases the chance of injury.
c. Has no effect on the chance of injury.

20. If the vehicle is hit in the left door initially, an unbelted driver:

a. Moves toward the left door.
b. Moves away from the left door.
c. Remains stationary.

21. Wearing safety belts on the road all day:

a. Lessens driver fatigue.
b. Increases driver fatigue.
c. Has no effect on driver fatigue.

22. An inertial reel safety belt system:

a. Always activates on impact.
b. Only activates if it is tight.
c. Activates when the driver's body pulls on the belt.

23. In an accident, safety belts will reduce the injury:

a. Occasionally.
b. Most of the time.
c. Almost all the time.

24. *In a crash, drivers that remain in the vehicle:*

a. Are almost always severely injured.
b. Are less likely to be injured than those that are ejected.
c. Are more likely to be injured than those that are ejected.

Opinion Questions

1. The use of safety belts by Troopers should be:

   a. Left completely up to troopers to decide
   b. Encouraged by the Department.
   c. Required by the Department.

2. Troopers should be expected to:
   a. Be as good as other drivers.
   b. Be better that other drivers,
   c. Be model drivers for other drivers.

3. Troopers should wear belts:

   a. Any time they are in a vehicle.
   b. Only when on duty.
   c. Only when involved in a hazardous situation.

4. Troopers who wear safety belts generally do so:

   a. To comply with the Departmental policy.
   b. To be good role models for other motorists.
   c. Because they feel belts make them safer.

5. When it comes to getting out of a car after a crash, safety belts:

   a. Tend to prevent it.
   b. Don't have any effect.
   c. Tend to help.

6. Which of the following statements about safety belts and an officer's duties is true?

   a. They tend to interfere with an officer's duties.
   b. They only interfere when the officer is in a hurry.
   c. They have no effect on the performance of duties.

7. Wearing safety belts on the road all day:

   a. Increases driver fatigue.
   b. Has no effect on driver fatigue.
   c. Lessens driver fatigue.

8. The best reason for an agency to require employees to wear safety belts is:

   a. To protect themselves against suits and other legal action in the event of an accident.
   b. To reduce lost work time.
   c. To protect their employees' health.

9. Requiring passengers to wear safety belts is:

   a. Minding other people's business.
   b. Being protective.
   c. An obligation.

10. Requiring children to wear safety belts is:

   a. Not practical.
   b. A good idea when possible.
   c. A responsibility.

11. The idea that safety belts are inconvenient is:

   a. Generally true.
   b. Partially true.
   c. A copout.

12. In an accident, safety belts will reduce injury:

   a. Occasionally.
   b. Most of the time.
   c. Almost all the time.

13. Safety belts serve to:

   a. To prevent injuries.
   b. To prevent accidents.
   c. To prevent accidents and injury.

14. When it comes to most enforecement activities, the time it takes to release a safety belt is:

   a. Enough to be dangerous.
   b. Enough to be an annoyance.
   c. Not enough to matter.

15. Law enforcement officers who refuse to wear safety belts are:

a. Placing the needs of the public above their own.
b. Not really concerned with the needs of the public.
c. Placing their own needs above those of the public.

16. Injury to law enforcement officers from automobile accidents is:

a. A risk that goes with the job.
b. Something you try to prevent,
c. Something that can be prevented.

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