

CNET SUPPORT
REPORT 1-78

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EVALUATION OF
NAVY DRIVER TRAINING

MULTIMEDIA SYSTEM (NDTMS) COURSE

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PREPARED FOR

THE CHIEF OF NAVAL EDUCATION AND TRAINING SUPPORT

BY

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1. CNET SUPPORT Study Report 1-78, "Evaluation of Navy Driver Training Multimedia System (NDTMS) Course," is promulgated for information.
2. The conclusions and recommendations contained in the report are those of the writer and are not necessarily those of the Chief of Naval Education and Training Support.
3. This publication has been reviewed under the provisions of SECNAVINST 5600.16 and is approved.


A. J. M. ATKINS

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61 recruits was given a course test as a pre-test. They were then provided the instruction and were retested with the identical course test. A third (control) group of 30 recruits were given the pre-test and post-test without intervening instruction. Responses to questions posed during each session were also collected from the experimental group. The Armed Services Vocational Aptitude Battery (ASVAB) Arithmetic and Word Knowledge subtest scores of the experimental and the control group were compared and there was found no significant difference between groups. The results showed that most recruits liked instruction through a multimedia method. Both the experimental group and the control group could answer just over 60% of the pre-test questions correctly before receiving any instruction. After instruction the experimental group had a 36% pre-to-post test gain while the control group without instruction had only a 3% pre-to-post test gain. An analysis of variance showed that the pre-to-post test improvement of the experimental group was caused by the intervening instruction. Fifteen test items did not have a pre-to-post test gain greater than 10%, and 13 items are covered by the two sessions not shown by the Navy. An evaluation of the objectives showed that there is not a clear one-to-one relationship between the objectives and questions in the sessions and the test. The following recommendations were made: (1) strive to keep the system hardware in line and report all malfunctions immediately, (2) purchase and show the two sessions that are not currently in the Navy's course, (3) eliminate the test session, (4) revise all sessions according to a systematic educational methodology, (5) provide an instructor with the course, (6) have a back-up plan/course available, and (7) maintain the student's environment at an optimal level for learning.

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1.0 Summary. An assessment was made of the instructional effectiveness of the Navy Driver Training Multimedia System (NDTMS). This system is a hardware/software package which has been installed by the Navy at five locations to teach traffic safety to personnel when they enter military service. NDTMS hardware is an Edex modular student response system. Presentation is made by the Edex system through the alternating of motion picture and slide sequences. The instruction used by the Navy was developed by the Air Force. The original course consisted of ten separate instructional sessions plus a 46 item multiple choice test. However, the Navy only uses eight of these instructional sessions and the test.

During the last week of September and the first week of October 1977, recruits were given questionnaires after each session which asked for their opinion of the presentation. A total of 796 questionnaires were collected. On the 13th and 14th of October 1977 an additional group of 61 recruits were given the course test as a pre-test. They were then provided all eight sessions of instruction and were retested with the identical course test. These recruits were considered the experimental group. Within the same time frame as the experimental group a third group of 30 recruits were given the pre-test and post-test without intervening instruction. These recruits were considered the control group. Responses to questions posed during each session were also collected from the experimental group. After instruction, scores on the Arithmetic (AR) and Word Knowledge (WK) subtests of the Armed Services Vocational

Aptitude Battery (ASVAB) were recorded for both the experimental and the control groups.

From these data the following analyses were made. The Arithmetic and Word Knowledge subtest scores of the experimental and the control group were compared and there was found no significant difference between groups. It was assumed, therefore, that the two groups came from the same population. Questionnaires were categorized as to whether they were favorable or unfavorable towards the presentation. Raw scores on the pre-test and the post-test of the experimental group and the control group were compared on the basis of raw score gain and of an analysis of variance. Individual items were also analyzed for their pre-to-post-test difference(s).

On an empirical level, test and instructional items were compared with course objectives using a task level/content type matrix. The results of the above analyses showed that the vast majority of recruits liked the presentation, and that they preferred instruction through a multimedia method to a method such as lecture or complete motion picture. Both the experimental group and the control group could answer just over 60% of the pre-test questions correctly before receiving any instruction. After instruction the experimental group had a 36% pre-to-post test gain while the control group without instruction had only a 3% pre-to-post test gain. The analysis of variance showed that the scores of the experimental group significantly improved from the pre-test to the post-test, and this improvement was caused by the intervening instruction.

The analysis of the pre-to-post test gain of the items showed that 15 items did not have a pre-to-post-test gain greater than 10%, 18 items did not meet minimum requirements of 90% on the post-test, and 13 items are covered by the two sessions not shown by the Navy. Instructional items are being used more as a tool for teaching students rather than strictly for evaluating progress or for testing knowledge.

The evaluation of the objectives showed that there is not a clear one-to-one relationship between the objectives and questions in the sessions and the test. Most of the objectives were consistent as far as task level and content type, but several objectives did not have supporting instructional or test items plus several items did not have objectives to support.

Based on the above analyses and on observations of the administration of the course, the following recommendations are made:

1. Strive to keep the system hardware on line and report all malfunctions immediately to the Naval Training Equipment Center.
2. Purchase and show the two sessions that are not currently in the Navy's course. If an eight-hour course must be maintained, eliminate instead both the first session and the last session.

3. Eliminate the test session unless it is to be used as an evaluation tool and scores are to be retained in the student's record.

4. Revise all sessions according to a systematic educational methodology.

5. Provide an instructor in the course to prepare students for each session and to discuss the subject material after each session.

6. Have a back-up plan/course available in case of hardware or software failure.

7. Maintain the student's environment during the course at an optimal level for learning.

2.0 Acknowledgements. This study could not have been accomplished without the expertise and assistance of specific people working for the Recruit Training Command (RTC), Orlando, Florida; the Naval Education and Training Program Development Center (NAVEDTRAPRODEVCCEN), Pensacola, Florida; and the Chief of Naval Education and Training Support (CNET SUPPORT), Pensacola, Florida. Through the cooperation of the Commanding Officer, Recruit Training Command, LT FRANK RUDDEN and ICI PAT STAFFORD provided excellent and willing support both during and after the evaluation. Mr. Robert Doucette, NAVEDTRAPRODEVCCEN, provided professional services as research consultant and statistician. Mr. William Rowe, CNET SUPPORT, conducted the comparative analysis of the objectives and acted as editorial assistant. Thanks is given to Miss Teresa Hindman who carefully prepared and handled the manuscript.

Finally, appreciation must be expressed to the Navy recruits who were patient and even eager subjects.

3.0 Purpose. This evaluation assesses the instructional effectiveness of the Navy Driver Training Multimedia System (NDTMS) utilizing the tests and materials provided with the system. Instructional effectiveness in this study means whether or not learning is taking place using the NDTMS. Through an evaluation of this type it can be determined whether and where instructional materials and test items need to be revised, eliminated, or left alone.

4.0 Background

4.1 The System. The Secretary of Defense, through DOD Instruction 1000.14, has set down the requirement to all departments to teach traffic safety courses. In response to DODINST 1000.14 the Navy has instituted defensive driving courses for all Navy personnel under 26 years of age when they enter military service. The requirement for these courses is included in OPNAVINST 5100.12 (Subj: Navy Motor Vehicle Safety Program). Until July of 1977, the Navy's traffic safety instruction consisted of the National Safety Council's Defensive Driving Course. In July the Navy began instruction of a hardware/software system called the Navy Driver Training Multimedia System (NDTMS).

The hardware used for the NDTMS is the Edex Modular Student Response System constructed by Doron Precision Systems, Inc. of Binghamton, New York. Edex systems have been installed

at each of the three Recruit Training Centers at Great Lakes, Orlando, and San Diego, at the Aviation School at Pensacola, and at the Officer Candidate School at Newport. The system configuration purchased by the Navy includes an instructor's console, student dial type actuators, a high-reflectivity projection screen, two 35mm slide projectors, and a 16mm motion picture projector. One actuator is secured to the top of each student's desk and is connected electrically to the instructor's console. A two-track tape cassette located in the instructor's console provides audio for the system and controls the sequencing of the three projectors. In this system for the NDTMS, students are primarily given instruction through the medium of motion pictures. Periodically the motion picture projector is stopped and the students are asked multiple choice questions about the instruction by means of the slide projectors. Students respond to these multiple choice questions by turning the dial to their selected answer on the actuator on their desk. Instructors can observe student's responses through light and needle indicators located on the console. The light indicators show individual responses and the needle indicators show the percent of students answering a certain way.

The instruction (software) used by the Navy for the course is entitled "Highway Challenges." This instruction was developed and is used by the U. S. Air Force. The presentation developed by the Air Force consists of eleven sessions (ten learning sessions and a test). These sessions are numbered MM7a through MM7k.

A title and description of each of these sessions is provided below:

MM7a - The Problem and a Logical Approach - Explains the Edex System and the Team Matrix. Brief introduction of what the complete course is about.

MM7b - The Environment, Part I - Covers how the environment plays an important part in the way we drive. Deals with different road surfaces, wet and dry, and shows stopping distances on both.

MM7c - The Environment, Part II - Deals with how the driver must intermix with other drivers in his environment and react to the sometimes wrong reactions of other drivers to minimize hazardous situations. Covers two second rule and stopping distances.

MM7d - The Auto - Covers how the condition of the vehicle affects maintaining control and how to compensate for various performance limitations of the vehicle.

MM7e - The Man, Part I - Covers how emotions and fatigue affect ones driving. Also covers the importance of clear vision and an understanding of the numerous limitations - physical and mechanical - which tend to impair that vision.

MM7f - The Man, Part II - Explains the effect of alcohol and drugs on man. Looks at the effect they cause both physically and how it affects the mind. Covers BAC and how weight is a factor in how drunk one gets on specific quantities of alcohol.

MM7g - The Task - Illustrates how the various factors in the Team Matrix interact and affect the accomplishment of the driving task: Plan trip, rest before trip, avoid peak traffic periods, load properly, make sure your auto is ready for the trip.

MM7h - One Every Two - The average driver makes one driving error every two miles on the road. Accidents are usually caused by two or more errors meeting each other at the same time.

MM7i - Emergency Situations - How to prepare one to deal with blowouts, stuck accelerator pedal, animal in road, brake failure, etc., and things you need to carry in your car in case of emergency - flares, tools, reflectors, first aid kit, spare tire, lug wrench and jack.

MM7j - The Mature Traffic Citizen - Three viewpoints on being a good driver and mature about driving.

MM7k - A Post-Test - A 46-item multiple-choice test.

Sessions MM7a through MM7i are instructed by means of alternating between the two slide projectors and the motion picture projector. Instruction is presented by means of the motion picture projector and then multiple choice question items are presented by means of the two slide projectors. Session MM7j is presented strictly through motion picture and session MM7k is presented only through slides. Session MM7j contains no question items and session MM7k contains all question items

shown sequentially. All items on the test have been taken verbatim from the questions in the ten sessions.

For the NDTMS, the Navy has purchased all but two of the sessions. These two sessions are MM7g (The Task) and MM7i (Emergency Situations).

4.2 The Study. By CNET message 312050Z of August 1977, the Chief of Naval Education and Training requested the Chief of Naval Education and Training Support to conduct an instructional effectiveness evaluation of the NDTMS and to monitor the integration and functioning of the system software and hardware at sites where the NDTMS is to be installed. Data collection for the evaluation was conducted during the last week of September and the first two weeks of October 1977 at the Recruit Training Command, Orlando, Florida. During the last week of September and the first week of October instructors gave male and female recruits an opinion survey after each session was shown to them. During the second week of October (13 and 14 October 1977) data was tested and gathered on three male recruit companies. A preliminary evaluation report was promulgated under CNET message 052220Z of December 1977.

Because of time constraints this study was conducted only at the Recruit Command. An analyses of the results of this study will determine if further research needs to be done using a sampling of officers.

5.0 Methodology

5.1 Subjects. The initial group of subjects for the statistical analyses consisted of 164 male recruits from Companies 333, 334, and 16 at the Recruit Training Command, Orlando, Florida. Company 333 included 71 recruits, Company 334 included 63 recruits, and Company 16 included 30 recruits. From Company 333, four recruits had to be eliminated because these recruits did not provide complete data or failed to fill in a billet number. Data from six additional recruits from Company 333 had to be rejected because the recruits were "drop backs" from a previous Company. All pre-test and post-test data from Company 334 were rejected because items in the pre-test were not in the same sequence as items on the post-test. During the presentation items were not numbered on the screen. If item sequence in the pre-test and post-test is not identical, answer sheets cannot be scores and items cannot be matched between tests. No data from Company 16 were rejected.

The final number of subjects utilized for the pre-to-post test analysis was 61 for Company 333, and 30 for Company 16. Company 333 was treated as an experimental group and Company 16 was treated as a control group.

In addition to a pre-to-post test analysis recruit responses to questions given during each session were recorded so that instruction in each session could be further evaluated. As recruits were instructed during the two days, some had to leave for a short time, and therefore may have missed one or

more sessions. This, of course, changed the N from session to session on the analysis of the items.

5.2 Procedures. During the defensive driving courses held the last week of September and the first week of October 1977, instructors from the Recruit Training Command, as part of their own evaluation of the NDTMS, gave male and female recruits taking the course a questionnaire on the instruction. A total of seven hundred and ninety six questionnaires were eventually filled out. Most questionnaires contained comments on only one session. However, some questionnaires contained comments on two or more consecutive sessions. The smallest number of questionnaires filled out for any one session was 44 (MM7j) and the largest number of questionnaires filled out was 127 (MM7f). All questionnaires contained five questions. They were the following:

1. Did you like the presentation of session ____?
2. Why?
3. Were there any parts that were difficult for you to understand in session ____?
4. Tell what part was difficult for you to understand or to not understand.
5. How many questions did you miss?

The general results of these questionnaires are discussed in this study in order to get an idea of whether recruits do or do not like the course.

On the afternoon of 13 October, recruits from Companies 333, 334, and 16 were given session MM7k as a pre-test for instruction. At this time, recruits from two Companies (333 and 334) were considered as the experimental group and were instructed on sessions MM7a through MM7d immediately after taking the pre-test. These recruits returned on the afternoon of October 14th and were instructed on sessions MM7e, MM7f, MM7h, and MM7j. They were then readministered session MM7k as a post-test. (As was mentioned above, data from Company 334 were subsequently rejected and only Company 333 became the experimental group.)

Recruits from Company 16 were considered as the control group. This Company took session MM7k as a pre-test at the same time as the experimental group. This control group returned about 24 hours later and were readministered session MM7k as a post-test. No instruction on the NDTMS was given to the control group between the pre-test and the post-test.

In order to preserve data, the dial type actuators were not used during the evaluation. Instead, responses to any questions were marked by the recruits on standard answer sheets used for Navy non-resident career courses. These answer sheets were used for the pre-test, the post-test, and each session. For the experimental group, as each session was completed, marked answer sheets were collected and clean sheets distributed.

Instructions to recruits included the fact that they were being used to evaluate the instruction. Scores received on the pre-test, post-test and instruction sessions would not be entered into their record and would not impact upon their Navy career in any way. In order to match pre-test, post-test, and instruction session scores, each recruit was asked to place his billet number on each answer sheet.

A feature of the NDTMS is that during each session recruits are given the answer to each question within 10 to 15 seconds after the question is presented. In this way recruits are given immediate feedback. (Answers are not given during the test session MM7k.) No question in the entire instruction has a number or other sequentially identifying symbol. Therefore, recruits had to be told that if they did not know the answer on the pre-test or post-test, or if they were given the answer during an instructional session before they could record their response on the answer sheet, they were to draw a line through the corresponding answer block on their answer sheet so that their answer on the answer sheets would not fall out of sequence with the questions.

After the evaluation courses were over, Arithmetic (AR) and Word Knowledge (WK) sub-test scores of the Armed Services Vocational Aptitude Battery (ASVAB) were collected from the Recruit Training Command for each recruit of both the experimental and the control groups.

5.3 Statistical Analyses

A. Arithmetic and Word Knowledge sub-test scores of the experimental group (Company 333, N=61) and the control group (Company 16, N=30) were compared for statistical significance utilizing the standard t test. This was done to determine if there was a significant difference between the two groups on their Navy entry selection tests. It was assumed that, if there was no difference, the two groups came from the same population.

B. Raw scores were compared between the pre-test and the post-test first of the experimental group and then the control group to determine percentage of raw score gain from one test to the other for each group.

C. Pre-test and post-test raw scores were compared both between tests and between groups using an analysis of variance. This was done to determine if instruction had a significant effect on overall amount learned. The analysis of variance was unequal N's unweighted means, fixed two factor design with repeated measures on the second factor. This is a common statistical procedure.

D. Test items of the experimental group were compared individually on their pre-to-post difference (i.e., number of times the item was answered correctly on the pre-test versus number of times the item was answered correctly on the post-test). Wherever applicable, these item scores were also compared with the score that the identical item received during instruction.

5.4 Item Comparisons with Course Objectives

A. Test items were matched empirically with the course objectives to see if all objectives were being tested.

B. Items given during sessions were matched empirically with the course objectives to see if all objectives were being covered.

C. The course objectives and the pre/post test items were categorized using the task level/content type matrix established in the Instructional Strategy Diagnostic Profile (ISDP) developed by Courseware, Inc.*

D. The test items associated with each of the course objectives were identified. Test items which were not in the same task/content categories as their related objectives were identified and recognized as being inconsistent.

6.0 Results

6.1 Subject Scores. From a statistical analysis of the pre-test and post-test scores of both the experimental group and the control group, the following results were found:

A. There was no significant difference between the experimental group and the control group on either the Word Knowledge (WK) subtest ($t=.85$, $df=89$, $p=ns^{**}$) or the Arithmetic (AR) subtest ($t=.11$, $df=89$, $p=ns^{**}$). For purposes

* Interim Training Manual for the Instructional Strategy Diagnostic Profile. NPRDC SR 77-14. M. David Merrill, Robert E. Richards, Reneta V. Schmidt, Norman D. Wood. Navy Personnel Research Development Center, San Diego. September 1977.

** To attain significance at the .05 level, t needed to be 1.99.

of comparing the two groups on the pre-test and post-test, it was therefore assumed that the two groups were from the same population.

B. Both the experimental and the control group knew a substantial number of answers to the pre-test (63% and 62%, respectively) before receiving any instruction at all. The experimental group had a 36% pre-to-post test gain while the control group had only a 3% pre-to-post test gain. After receiving instruction, the experimental group could answer 87% of the test items correctly. Table 1 summarizes these findings.

C. Tables 2 and 3 summarize the analysis of variance. Each of the error terms in the analysis was subdivided and tested for homogeneity by means of Fmax test. The error terms proved to be homogeneous, therefore no transformation of the data was required. The analysis shows that (1) the instruction effect (A) is significant ($F=46.13$, $F_{.99}(1,89)=6.81$), (2) the test effect (B) (pre-post) is significant ($F=132.22$, $F_{.99}(1,89)=6.81$) and that (3) the instruction x test interaction (AB) is significant ($F=94.04$, $F_{.99}(1,89)=6.81$).

For the instruction effect (A) it can be concluded that the mean score for the experimental group is significantly greater than the mean score for the control group ($p<.01$).

For the test effect (B) it can be concluded that the mean score of the post-test is significantly greater than the mean score of the pre-test ($p<.01$).

TABLE 1

EXPERIMENTAL GROUP
AND CONTROL GROUP
RAW SCORE DATA

<u>GROUP</u>	<u>PRE-TEST</u>	<u>POST-TEST</u>	<u>PRE-TO-POST TEST GAIN</u>
Experimental N=61	Mean=29.18 Range=10-38 Percent Correct=63%	Mean=39.77 Range=23-44 Percent Correct=87%	36%
Control N=30	Mean=28.47 Range=19-36 Percent Correct=62%	Mean=29.37 Range=21-37 Percent Correct=64%	3%

TABLE 2

Summary of Analysis of Variance
(Driver Training Instruction Data)

Source of Variation	df	SS	MS	F
<u>Between subjects</u>	<u>90</u>			
A (Instruction)	1	1242.78	1242.78	46.13 p<.01
Subject w. groups (error)	89	2398.50	26.94	
<u>Within subjects</u>	<u>91</u>			
B (Tests)	1	1327.48	1327.48	132.22 p<.01
AB (Instruction x Tests)	1	944.14	944.14	94.04 p<.01
B x subjects w. groups (error)	89	893.72	10.04	

<u>A (Instruction)</u>	<u>B (Tests)</u>
a ₁ Control	b ₁ Pre
a ₂ Experimental	b ₂ Post

TABLE 3

A Posteriori Tests (Instruction x Test interaction)

	$\overline{A_1 B_1}$	$\overline{A_2 B_1}$	$\overline{A_1 B_2}$	$\overline{A_2 B_2}$
Means	28.47	29.18	29.37	39.77
$\overline{A_1 B_1}$	-	.71	.90	11.30
$\overline{A_2 B_1}$	-	-	.19	10.59
$\overline{A_1 B_2}$	-	-	-	10.40
$\overline{A_2 B_2}$	-	-	-	-

r = 2 r = 3 r = 4

$\sqrt{MS_{B \times \text{sub w. groups}} / n}$ $q_{.95}(r, 89)$ 2.82 3.38 3.72 needed at .05 level

$\sqrt{MS_{B \times \text{sub w. groups}} / n}$ $q_{.99}(r, 89)$ 1.41 1.69 1.86
 $q_{.99}(r, 89)$ 3.73 4.24 4.55
 $\sqrt{MS_{B \times \text{sub w. groups}} / n}$ $q_{.99}(r, 89)$ 1.86 2.12 2.27 needed at .01 level

The instruction x test (AB) interaction results are summarized in Table 3. From the a posteriori tests on the instruction x test (AB) interaction, it can be concluded that:

1. The experimental group scored significantly higher on the post-test than all other AB treatment combinations; experimental group on the pre-test, control group on the pre-test, and control group on the post-test.

2. There were no significant differences between test means for any combination of the experimental group on the pre-test, the control group on the pre-test, and the control group on the post-test.

Figure 1 illustrates the effect of the differences among the tests of the two groups.

6.2 Item Summary. Appendix A lists the items of the test (session MM7k) that were used as the pre-test and post-test. Items are listed sequentially as they are presented to students. Appendix B presents the item score summary for the pre-test and the post-test of the experimental group. "Item Score" is the number of times recruits of the experimental group answered the item correctly. On this table, items are rank ordered according to the percent of people getting the item correct (column 5) on the post-test. Also shown on this table is the session and sequential number in the session where the item is repeated (column 8). For these items, except those in sessions not taught by the Navy, the raw score in the session (column 9) and the percent of recruits getting the item

AB INTERACTION

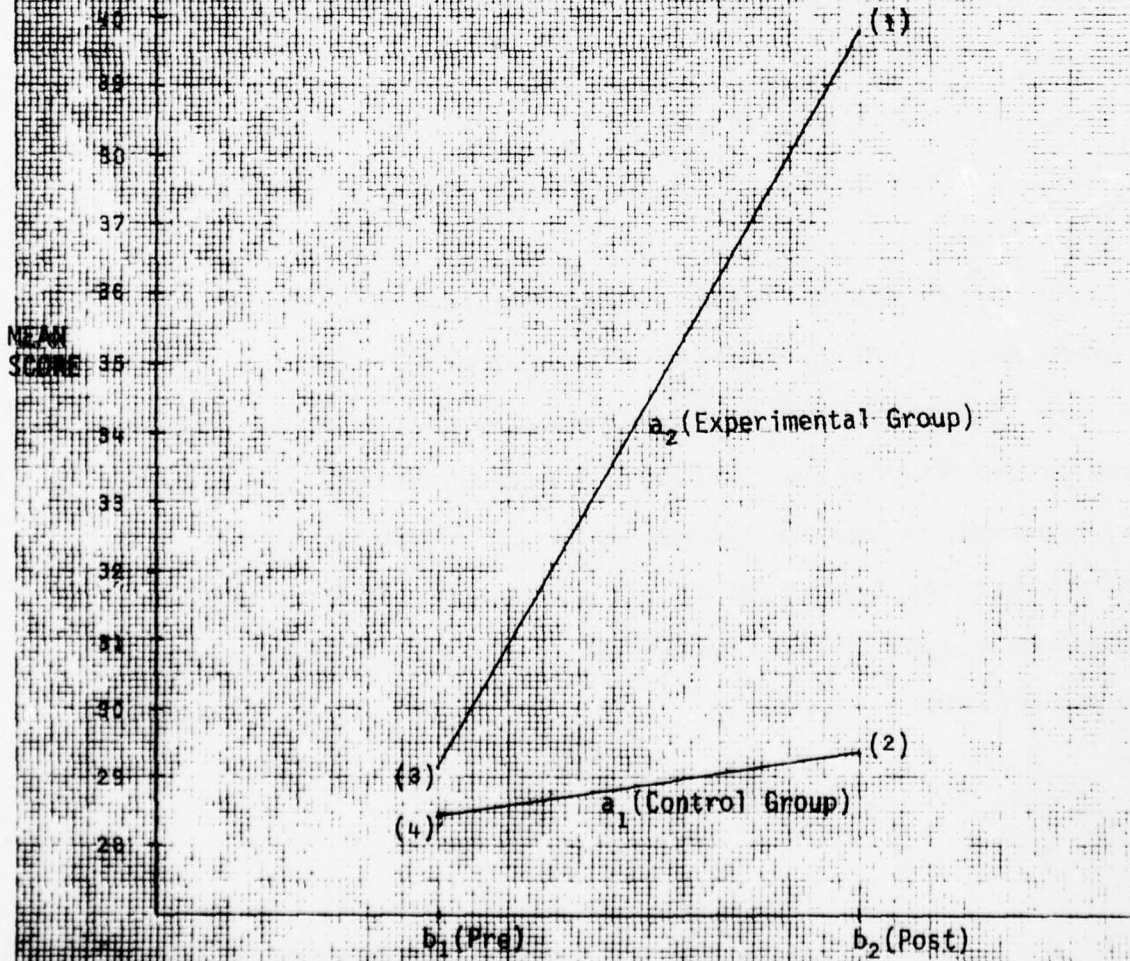
a₁ - Control Group

a₂ - Experimental Group

b₁ - Pre-Test

b₂ - Post-Test

(R) - Rank order of means high to low:
(1) to (4)



TEST

FIGURE I

correct in the session (column 10) is also given. Appendix C lists all the items that are given in each session taught by the Navy. Appendix D provides an item score summary by session of both test items and instructional items. Items are rank ordered by the score they received in the instruction (column 7). If an instructional item is also a test item, the pre- and post-test scores are also given.

An analysis of Appendix B shows the following results:

A. If a criterion of a ten percent pre-to-post gain is considered an acceptable level of learning of an item, fifteen items (33%) on the test would have to be revised or eliminated. Three items showed no gain at all and three items showed a slight loss.

B. Eighteen test items (39%) do not meet minimum requirements of 90% of the subjects getting the item correct on the post-test.

C. Seven items (15%) are being answered correctly on the pre-test by 90% or more of the subjects.

D. Thirteen test items (28%) do not have an equivalent question in the Navy's instruction. These questions are covered in the two sessions the Navy doesn't have. Seven of these items are not being taught to at all in the instruction while six items are taught in the remaining sessions but are covered only superficially.

An analysis of Appendix D shows the following results:

A. The percent of questions answered correctly by recruits over the 90% level ranges from 11% for session MM7a to 50% for session MM7d. A summary of these results is shown on Table 4.

B. Of those instruction questions which are included in the test, five had a session item score that was higher than the post-test, and seven had a session item score that was lower than the pre-test.

C. Of the 108 questions asked during instruction, 34 (32%) were repeated in the test. The percentage distribution of these questions among sessions ranges from 66% for session MM7a to 17% for section MM7b. A distribution of this finding is also found in Table 4.

6.3 Objective Summary. Appendix E lists the basic objectives of the entire course. As was stated under the methodology, objectives were matched with test items and with items given during the instruction. The test items that match the objective are placed in the first column on the right hand of the page next to its objective. The related instructional items are in the second column next to its objective. Objectives were also categorized by their task level and content type. Both task level and content type of the objective are listed to the left of each objective. Task refers to the behavior a student is required to display toward the content, and each objective can be assigned a task level. These levels and their appropriate codes are provided below:

TABLE 4
SUMMARY OF ITEMS BY SESSION

<u>SESSION</u>	<u>NUMBER OF ITEMS</u>	<u>NUMBER OF ITEMS ABOVE 90%</u>	<u>PERCENT OF ITEMS ABOVE 90%</u>	<u>NUMBER OF SESSION ITEMS ON POST-TEST</u>	<u>PERCENT OF SESSION ITEMS ON POST-TEST</u>
MM7a	9	1	11%	6	66%
MM7b	24	4	16%	4	17%
MM7c	20	4	20%	5	25%
MM7d	22	11	50%	8	36%
MM7e	9	3	33%	3	33%
MM7f	11	2	18%	4	36%
MM7h	13	5	38%	4	31%
TOTAL	108	30	28%	34	32%

UGeg - Use generalities on newly encountered examples

RpG - Remember paraphrased generalities

RvG - Remember verbatim generalities

RpeG - Remember paraphrased examples

Rveg - Remember verbatim examples

The content refers to the subject matter a student is asked to deal with. There are four content types:

Fact - The student is required to remember an arbitrarily associated name for an objective, symbol, etc.

Concept - The student is required to state a definition or classify examples according to a definition.

Procedure - The student is required to state an algorithm or actually implement the algorithm to solve a problem.

Principle - The student is required to state the relationship between various concepts or explain some condition or results by referring to relationships between concepts.

Upon applying the above model, the following results were derived:

A. Five of the course objectives were not supported by test items.

B. Course objectives were not mutually exclusive. Several objectives are identical, only reworded.

C. Four test items do not relate to any of the course objectives.

D. Four test items are generally related to objectives but are not consistent with the thrust of the objective.

E. Except for main objectives No. VI (Traffic Violations and Driving Errors) and No. VII (Emergency Situations), the task level and content type of the objectives are consistent. The primary task level is to remember paraphrased generalities and the content type is "principle."

F. Eleven instructional items are not at all related to objectives or are related by common subject only.

G. Three instructional items, albeit related to objectives, are not consistent with the objectives according to the ISDP model.

6.4 Questionnaire Results. All questionnaires were looked through and a judgement made on each as to whether the recruit liked the presentation, did not like the presentation, or was indifferent to the presentation. There were 796 questionnaire sheets in all. Six hundred and sixty five of the sheets evaluated one session only, and 131 had either evaluated the entire program or had evaluated more than one session. By far most of the recruits said they liked every session. Considering all 796 evaluation sheets, 88% answered yes to the question, "Did you like the presentation of session _____?" Ninety percent of the evaluation sheets which had evaluated a single session had answered yes to this question. The lowest percentage of positive responses was on session MM7f (80%) which covered the effects of drugs on driving.

The highest percentage of positive responses was on session MM7j (98%). Some of the most common reasons the recruits said they liked the sessions were that the sessions were interesting and informative, they were better than a lecture, and they taught them a lot of things they didn't know. Primary reasons for not liking the sessions were that they were boring, repetitive, had tricky or stupid questions, and there wasn't enough time to answer questions.

Over 90 percent of the recruits answering question 3 said that they did not have any difficulty understanding any of the material on any of the sessions. The primary complaints were that the answers were given too quickly to the questions. Two other complaints which seemed to stand out were that the recruit had difficulty seeing the slide screens and that the questions on session MM7f which required mathematical computation of alcohol content were difficult. However, less than ten questionnaires contained this comment.

Only a few questionnaires contained answers to question 5 (How many questions did you miss?). Responses ranged from "none" or "a few" to an actual numeral.

7.0 Discussion. Based on student and instructor opinion, the NDTMS seems to be a preferred system for teaching traffic safety education than the National Safety Council's Defensive Driving Course. The vast majority of the Navy's recruits who were questioned about the NDTMS liked the presentation.

Ninety percent of the questionnaires filled out on the presentation were positive. Recruits found the presentation entertaining and informative and said they would rather be instructed by a multimedia system than a series of lectures. The fast pace, racy dialogue, and constantly changing scenery and media of the NDTMS appeals a great deal to the Navy recruits. Throughout the presentation, the language and situations are common and relevant to the age group (18-26 years) to which the Navy presents the course. Scenes are kept interesting by constant action and a tight, smooth flowing script. With few exceptions, there does not appear to be any wasted time. Facts and examples are provided in a constant stream. There is repetition, but it is purposeful repetition. Attitudes cannot normally be changed through a single statement of a fact. The majority of recruits also said that they had no difficulty understanding the material. Written complaints were related to technical areas (i.e., couldn't see the screen) rather than the content.

The original scope of the present study was to determine if learning was taking place, and if so, how much. It was found that recruits did learn a great deal from the instruction, however, a more important finding was that a large number (over 60%) of the test items could be answered correctly by recruits before they received instruction. This could be because (1) many of the recruits may have taken a driver training course as a required part of their high

school curriculum, (2) the recruits have already had about two to ten years of driving experience, and (3) most of the test questions appear to be answerable by using a little common sense. In spite of high pre-test scores, there was still a substantial pre-to-post test gain (36%) which, as was stated above, would indicate that learning is taking place. The average post-test score for the experimental group was 87%. For good results, post-test scores should be 90% correct or better. If the 13 test items which were covered by the two sessions that the Navy did not purchase were to be eliminated, the average post-test scores would be raised to 89% by simply dropping those scores from the computations. This of course would show that by not providing the additional two sessions, students are not necessarily helped on the test, but by not having this knowledge their scores are certainly more depressed.

The course, "Highway Challenges," is the first of six courses which together make up the Air Force Traffic Safety Education Program. The purpose of this program as designed by the Air Force is to teach the student how to avoid accidents. As part of the Traffic Safety Education Program, the concept of the "Highway Challenges" course was and still is to be a motivational tool and not necessarily a training course. It has been promoted as a training course, but its original intent is to reduce accidents by changing attitudes. The course operates on the premise that, if safety attitudes and driving concepts can be implanted in the minds of young

drivers, a significant reduction in traffic accidents will be effected. Whether or not the course actually changes attitudes and through these attitudes prevents accidents was beyond the scope of this study. Personnel who have developed the course, however, believe that their program has delivered to the Air Force significant savings in accidents, injuries, lives, and costs. As a measure of their experience using the total traffic safety education program, personnel in the USAF state that the first six years of operation of their Traffic Safety Education Program, as compared with the previous six years, resulted in a 22% reduction in fatalities, 31% reduction in injuries, 27% reduction in accidents, 29% reduction in lost time, and 19% reduction in costs. These same people admit, of course, that many, many factors impact upon accident rates, including a lower speed limit and fewer people in the Air Force. Nevertheless, they feel that their program had an influence because similar statistics in the civilian world increased during the same time period.

The fact that the "Highway Challenges" course was not strictly designed for teaching is apparent on several counts. For one thing, there is no educationally systematic inter-relationship between the course objectives and the instructional material. For example, there are test items which are not consistent with objectives. There are test items which are subjective, and for which therefore there is no answer. (Their purpose is to check for attitude.) There are objectives which are not addressed either by test items or by

instructional items. There are objectives which are not consistent with test items.

The question and answer format itself appears to be a means for delivering information or maintaining student's attention rather than student evaluation. Several instructional items are not preceded by information that is necessary for the student to make a correct response. As a result the student may only be able to make a random choice of the available (multiple choice) responses. Whatever the student may respond to, he is shortly shown the correct response. This response is then verbally reinforced. Items in the instruction have different point values than identical items in the test. The system does not give the instructor a means of permanently recording student responses to individual questions. The system is designed more to give an overall picture of how the class or student is doing, and item by item monitoring is difficult.

Because the presentation was originally designed more as a motivational tool rather than a strict instructional tool does not preclude its value for instruction. This study has shown that the NDTMS does indeed instruct. There is no reason why the presentation could not be used both to change attitude and to efficiently and thoroughly teach. Indeed it is much easier to measure learning than it is to measure attitude change.

To improve the presentation's instructional value, the following steps should be taken.

1. The objectives should be re-evaluated and re-written

according to behavioral terms. Re-evaluation of objectives means determining exactly what needs to be taught in a defensive driving course, and writing these requirements down in accordance with a systematic educational methodology (e.g., Bloom's Taxonomy).

2. After objectives have been revised, instruction needs to be aligned, where necessary, with the objectives.

3. A determination needs to be made as to whether items given during instruction are to be used strictly to evaluate the student or are to be used as a method of instruction.

Using the question and answer format to teach is not necessarily an undesirable method of instruction. Twenty-one of the pre/post test items which are repeated in an instructional session may indeed be teaching because their post-test raw score is higher than their raw score they received during instruction (See Appendix B). (Those seven items which have an instructional raw score lower than the pre-test need to be clarified and related instruction revised. Instructional questions which have raw scores greater than the post-test may be confusing to the students, or students may have answered the item after the answer was given.)

As mentioned above the use of a question and answer format is a perfectly acceptable mode of instruction. Given the scope of this particular course, however, it is inappropriate for these same questions to be reused as indices of post-instruction concept mastery. As identified through application of the

ISDP procedures the vast majority of the objectives of the NDTMS intend for students to reach an understanding of the material in terms of paraphrased generalities. This dictates that the curriculum and test items be oriented toward a broad transfer of the material that is presented. Repeating the instructional questions in the post-test does not permit the effectiveness of the instruction to be measured in terms of its generalizeability. It could be that a sizable percentage of the pre-test to post-test gain noted for this course represents the students' ability to recall specific answers to previously encountered problems rather than the hoped for understanding prescribed by the course objectives.

If questions and answers are to be used as a method of instruction, then there is no purpose to keeping track of the student's progress on the console during a session, nor is there a need to re-use instructional items as a formal test after the session is over. If the answer to the question has not been explicitly stated in the instruction given prior to the question, then the student cannot be expected to know the answer to the question and he can not be graded on the question. Under these conditions, the student would be expected to know the answer and could be justifiably tested on the answer only after he had been given both the question and the answer.

If the instructional questions and the final test are to be used to actually test the student's knowledge, then each question and its related instruction needs to be analyzed

as to whether learning is taking place. Appendix B and D would provide a good start for this analysis. Further study would start with using all test items as a pretest and post-test. Instruction would be revised if there was no pre-to-post test gain, and/or if the post test raw score was less than 90%. Once the pre/post test analysis has been done and the 90% criteria has been met, it may be desirable for the raw scores of each session and of the post test (revised) to be retained as part of the student's record.

Because the course is several years old, some of the scenes are slightly outdated. For example, speed limit signs are over 55 mph. (Speed limits were changed to 55 mph in the fall of 1973.) For the most part, none of the instructional or test items addressed directly the outdated material. Most questions deal with facts and concepts which are still current. Some information, such as the number of alcohol related traffic deaths might no longer be accurate but the fact that alcohol is a major contributor to traffic related deaths is still true. In a presentation of this magnitude, outdated material cannot be entirely avoided, and whether the material impacts upon learning or student credibility is unknown. Nevertheless, instructors may want to mention the fact that the presentation was developed in the early 70's, and students must make allowances for a few outdated scenes. When the presentation is revised, it would be expected that all information and scenes would be made current.

The first seven sessions (MM7a through MM7g) of the presentation are based upon the TEAM concept. TEAM is an acronym which stands for Task, Environment, Auto, and Man. Session MM7a introduces and explains the concept. Sessions MM7b through MM7f cover the environment, the auto, and the man separately. Session MM7g, which was not purchased by the Navy, ties the environment, auto, and man together into the total driving task. Part of the TEAM concept includes the grading of the task, environment, auto, and the man into four levels of condition. Level I is the best condition and level IV is the worst condition.

The TEAM acronym seems to be useful and helps students better understand a very complex behavior by separating the behavior into components. For the Navy, a major component is missing by not showing session MM7g (The Task). This session not only completes the TEAM acronym but draws all the components together into a conceptual whole.

Although the TEAM acronym is an assist to learning, the levels of condition are ambiguous. There is no clear distinction between levels. Several questions which ask for students to identify a level of condition give more than one condition as the answer (i.e., could be II or III or could be III or IV). The basic idea of the condition levels is to show that driving conditions range from good to bad, and that the man must take these factors into account while driving. This is a good point, but needs to be more accurately presented in the course.

There are other factors which impact upon learning which need to be considered.

There were some major equipment problems experienced in the initial installation of the NDTMS which delayed this evaluation for awhile. To correct these problems, the contractor has installed modifications in the trainers to increase system reliability. All systems are now fully operational. Some minor design problems do still exist. The dial actuators are not lighted. If sufficient light is provided to allow the students to see the actuators, some students have difficulty reading the questions on the screen. The NTEC Project Engineer recommends the use of red lighting in the classroom to permit illumination of the actuators without washing out projected images on the screen. The dial actuators are also fragile. Students have a tendency to play with the actuators during the presentation, and some dials get broken during each course.

There is no back up instruction available should any mechanical or software problems arise. An instructor's presentation guide is given at the front of the script of each session. The guide includes equipment set-up specifications, the instructional points that are to be made by the session, and some general procedures on how to prepare and brief each student before and after each session. Guides are supplements to and not replacements for the session. If the hardware system has mechanical problems or if the software

does not function properly the school must move the class to a different system, have the class return another day, or not give the presentation at all.

A qualified instructor needs to be present for each course. Although the NDTMS can be considered self-contained, it was intended that a continuing discussion of the course be held before and after each session. This discussion allows the instructor to prepare students to look for major points, to receive feedback on the course, to correct any misconceptions, and to reinforce all objectives. Additionally, if the hardware or software fails, the instructor would need to step in for the course.

Environmental factors also affect learning and must be taken into consideration. During the first day of the course in which this evaluation was conducted, room temperature appeared to be optimal for comfort. Recruits were generally alert and receptive subjects. On the second day, room temperature and/or humidity was higher, and instructors needed to constantly awaken recruits at their desks. Secondly, proper space requirements for lecture rooms need to be adhered to. The Department of Defense has established the minimum space allowances for a lecture room containing fifty seats as 974 net square feet. This allows for 19.5 square feet per seat. For rooms containing 90 seats a room size of 1530 net square feet is needed, allowing 17 square feet per seat. Overcrowding of classrooms hinders access in emergencies, generates excessive heat, and may block viewing of the presentation.

8.0 Recommendations: Based on the above findings, the following recommendations are made:

8.1 Report hardware problems to NTEC promptly and do whatever is possible to maintain system reliability. If the Edex systems prove to be unreliable, consider replacing them.

8.2 Purchase and show sessions MM7g and MM7i in order to complete the Highway Challenges Course. Session MM7g (The Task) is needed to complete the explanation of the TEAM concept. This session ties the previous sessions together. Session MM7i (Emergency Situations) is a critical session to driver safety training. It covers such aspects as what to do if breaks fail, the steering system fails, and tires are punctured. If the Navy must be limited to an eight hour course, then it is recommended that session MM7a (The Problem and a Logical Approach) and MM7j (The Mature Traffic Citizen) be dropped. Session MM7a can be primarily covered by the instructor in about 15 minutes through an explanation of the TEAM concept. Session MM7j is basically an overview of the course. It repeats and summarizes what has been said in previous sessions.

8.3 Do not show session MM7k (The Post Test), unless it is to be used as an evaluative instrument. Items in the test are identical to those in the sessions. Students receive no immediate feedback to the items during the test, and schools do not keep records of any scores. For these reasons, the use of the current test is superfluous.

8.4 Revise the sessions according to a systematic educational methodology starting with the objectives, and working directly from the objectives to the instruction and items. Validate each relevant item at the 90% level. At this same time all scenes would also be updated with current information.

8.5 Provide an instructor for each course who will explain what the student is about to see before each session and will hold a discussion of the material after each session. These instructional procedures are included in and are in accordance with the instructor's presentation guides that have been provided with the system.

8.6 Either provide backup instruction or policy guidance to instructors in case of system failure. If a session cannot be shown, proper procedures and replacement instruction needs to be established. This recommendation may not be needed if the system proves close to 100% functionally reliable.

8.7 Be sure that when the course is conducted, all environmental factors, especially room temperature and room size, are optimal for learning.

APPENDIX A

LIST OF TEST ITEMS

TEST ITEMS

Test 1: Present losses from traffic accidents are: (A) Unacceptable, B. Bound to increase, C. Tragic but unavoidable, D. A fact of life

Test 2: Most people are good drivers: (A) I agree, B. I disagree, C. Undecided

Test 3: Fog is especially dangerous because of: A. Higher speeds, B. Increased traffic density, (C) Restricted visibility, D. All of the above

Test 4: Which road surface has the least traction when wet?: A. Concrete, B. Rough asphalt, (C) Smooth asphalt, D. All about the same

Test 5: Which of these road surfaces is best when dry?: A. Concrete, B. Rough asphalt, C. Smooth asphalt, (D) All about the same

Test 6: Under these conditions, what should you do?: A. Decrease following distance, (B) Increase following distance, C. Maintain same following distance

Test 7: In a sudden downpour, what should you do first?: A. Turn on lights and windshield wipers, (B) Reduce speed and increase space cushion, C. Prepare to leave the main roadway, D. Turn on radio for weather/road reports

Test 8: A good reason to give your car a "walk around" inspection is: A. Spot leaks under car, B. Check tire inflation, C. Make sure lights and windshield are clean, (D) All of the above

Test 9: Poor highway design and faulty equipment contribute to more accidents than "driver error" does?: A. True, (B) False

Test 10: Who should wear safety belts?: (A) All occupants, B. Driver only, C. Front seat passengers only, D. Full grown adults

Test 11: In freeway lane selection, which is the least important to consider?: A. Other traffic, B. Your speed, C. Nearness to exit, (D) Posted speed limit

Test 12: If all drivers and passengers used safety belts, what would be the main result?: (A) Reduce yearly traffic deaths by about half, B. No measurable effect, C. Decrease number of minor accidents, D. None of the above

Test 13: What does a raised rear end and over-sized rear tires do to a car?: A. Gives better visibility, B. Increases stability, (C) Requires more attention to control, D. Gives better braking control

Test 14: What should maximum tire pressure be based on?: (A) Manufacturer's recommended levels, B. Condition of tread, C. Anticipated highway speeds, D. All of the above

Test 15: Of the 500 weekly alcohol related traffic deaths, how many involved a legally drunk driver?: A. 300, B. 350, (C) 400, D. 450

Test 16: Which is the least important when selecting your speed on the freeway?: (A) Distance you have to travel, B. Traffic flow and volume, C. Weather and visibility, D. Posted speed limit

Test 17: What fact confirms that night driving is more hazardous than day driving?: (A) Over half of fatal accidents occur at night, B. Headlights are not bright enough, C. Less cars on the road, D. None of the above

Test 18: How should you adjust to factors that limit what you see: A. Be more alert and pay more attention, B. Reduce driving speed, (C) Both "A" and "B", D. Neither "A" or "B"

Test 19: When you are under strong emotional stress should you drive? A. Almost always, B. Frequently, C. Sometimes, (D) Almost never

Test 20: What is the most frequent factor contributing to fatal highway crashes?: A. Hallucinogens, B. Prescription drugs, C. Opiates, (D) Alcohol

Test 21: Of the 55,000 annual fatalities, how many of these have alcohol involvement?: A. One half, (B) More than one half, C. Less than one half, D. One third

Test 22: The drug user most likely to be found driving under the influence of the drug is: A. The heroin user, (B) The alcohol user, C. The LSD user, D. The barbiturate user

Test 23: Each time you enter your car: (A) You will be faced with a new driving task, B. You need not be concerned about the driving task except on long trips, C. The task, like commuting, will always be the same

Test 24: When entering a freeway you should: (A) Stay in right lane until car attains speed of traffic, B. Cut over to left speed lane as soon as possible, C. Sound horn to warn other traffic

Test 25: When may you overload your vehicle?: A. If weight is distributed evenly, B. When rear view mirrors are not blocked, C. If you tie down loose objects, (D) Never with safety

Test 26: When can you safely inter-mix tires of different construction on your car: A. If you maintain proper pressure, B. If you keep wheels balanced, (C) Never with safety

Test 27: What is the safest way to negotiate a curve?: A. Enter at slightly less than the posted speed limit and maintain or slightly increase acceleration, B. Apply brakes as you enter, C. Drop to lower gear and apply brakes once you enter curve

Test 28: Did I know more about driving on the day I got my license than I do now?: A. Knew as much then, B. Know more now

Test 29: Fatigue and drowsiness can best be overcome by: A. Chewing gum, B. Drinking black coffee, C. Turning on the radio, D. Pulling off the road and resting

Test 30: With rest stops, what is the maximum safe time a driver should spend behind the wheel?: A. 6 hours, B. 8 hours, C. 10 hours, D. 12 hours

Test 31: At an uncontrolled intersection, such as this one, which car should yield?: A. "A", B. "B"

Test 32: You can best prepare for this unpredictable emergency situation by: A. Planning your action, B. Training your reactions, C. Rehearsing your responses in your mind while driving, D. All of the above

Test 33: In this situation your best course of action is: A. Jam on brakes, B. Sound horn, brake hard, steer right, C. Sound horn, brake hard, steer left, D. Sound horn, hit brakes momentarily, steer straight

Test 34: When confronted with this emergency situation, what should you do?: A. Swerve sharp right to avoid hitting animal, B. Brake hard, release, dodge, if possible, or hit animal, C. Sound horn, and continue straight, D. Swerve left and go around animal

Test 35: What should you do in this situation?: A. Brake hard before you reach the ice, then maintain speed and steer straight, B. Once on the ice, take foot off accelerator, C. Keep firm steady pressure on brakes until past ice, D. Increase speed to carry you over the ice quickly

Test 36: What should you do when your tire begins to go flat on the highway?: A. Speed up in order to get to a service station quickly, B. Look for a safe place to pull off the road, C. Come to a quick stop and then pull off the road, D. Stop where you are and signal other traffic to go around

Test 37: What would you do if your brakes failed?: A. Rapidly pump brakes to build up power, B. Sound horn to warn pedestrians and downshift, C. Apply emergency brake, D. All of the above

Test 38: Which is the least important in determining a safe following distance?: A. Condition of other vehicles, B. Distance you have to travel, C. Weather and road conditions, D. Visibility

Test 39: Stopping with your wheels cut left while waiting to turn: A. Assures you are ready to turn safely, B. Allows you to quickly complete the turn when clear, C. Is a driver error

Test 40: Failure to make frequent checks of the rear view mirrors: A. Is a driver error, B. Is a traffic violation, C. Both "A" and "B"

Test 41: Swinging wide on right hand turns: A. Enables you to safely clear the curb, B. Is a driving error, C. May be a violation, D. Both "B" and "C"

Test 42: Looking forward before the backing operation is complete: A. Is an unsafe habit and a driver error, B. Is safe if nothing is behind your vehicle, C. Is safe if a walk-around check was made

Test 43: Most people are reasonable: A. I agree, B. I don't agree, C. Undecided

Test 44: What driver error probably caused this accident?: A. Excess speed, B. Following too closely, C. Stopping too quickly

Test 45: In this situation, which is the most critical visual cue to the changing environment?: A. The speed limit sign, B. The brake lights ahead, C. The destination sign

Test 46: What is the most important factor in your car's ability to stop on a dry road?: A. Speed, B. Horsepower, C. Condition of tires, D. Weight of car

APPENDIX B

TEST ITEM SCORE SUMMARY

TEST ITEM SCORE SUMMARY

1	2	3	4	5	6	7	8	9	10
Item	Pre Test Raw Score	% Getting Item Correct	Post Test Raw Score	% Getting Item Correct	Raw Pre to Post Test Item Gain	% Pre to Post Test Item Gain	Corresponding Item in Inst.	Inst. Item Raw Score	% Getting Item Correct
42	58	95	61	100	+3	5	h4	54	89
20	57	93	61	100	+4	7	f4	60	98
45	46	75	61	100	+15	33	b17	52	85
2	22	36	60	98	+40	182	a6	52	85
8	59	97	59	97	0	0	d1	56	100
10	59	97	59	97	0	0	d3	55	98
29	53	87	59	97	+6	11	g22		
24	53	87	59	97	+6	11	g5		
13	54	89	59	97	+5	9	d6	55	98
22	49	80	59	97	+10	20	f11	52	85
39	42	69	59	97	+17	41	h9	52	85
44	52	85	59	97	+7	14	a1	55	90
23	51	84	58	95	+7	14	g2		
16	48	79	58	95	+10	21	c4	55	92
36	55	90	58	95	+3	6	i12		
37	55	90	57	93	+2	4	i15		
31	19	31	57	93	+38	200	a2	27	44
12	47	77	57	93	+10	21	d5	53	95
28	55	90	57	93	+2	4	e1	50	88
9	51	84	57	93	+6	12	a8	50	82
3	52	85	56	92	+4	8	b18	52	85
4	23	38	56	92	+33	144	b23	56	
40	34	56	56	92	+22	65	h6	55	90
5	11	18	56	92	+45	409	b22	51	84
26	40	66	56	92	+16	40	g11		
38	35	58	56	92	+21	60	c7	58	97
18	49	80	55	90	+6	12	e4	41	72
17	30	49	55	90	+25	83	d20	51	91
19	54	89	54	89	0	0	e8	47	83
1	8	13	53	87	+45	563	a7	30	49
43	18	30	52	85	+34	189	a5	50	82
25	53	87	52	85	-1	-2	g10		
15	15	25	51	84	+36	240	f2	44	72

APPENDIX C

LIST OF SESSION ITEMS

LIST OF SESSION ITEMS

- a1: What driver error probably caused this accident? A. Excess speed,
 B. Following too closely, C. Stopped too quickly
- a2: At an uncontrolled intersection such as this one, which car should
yield: A. B.
- a3: Which category driving task is this? A. I, B. II, C. III, D. IV
- a4: How many did you remember? A. All of them, B. Missed one,
C. Missed two, D. Missed 3 or 4
- a5: Most people are reasonable. A. I agree, B. I don't agree,
C. Undecided
- a6: Most people are pretty good drivers. A. I agree, B. I disagree,
C. Undecided
- a7: Present losses from traffic accidents are: A. Unacceptable,
B. Bound to increase, C. Tragic, but unavoidable, D. Fact of life
- a8: Poor highway design and faulty equipment contribute to more accidents
than driver errors. A. True, B. False
- a9: From what you've seen and hears so far, would you like to participate
in the rest of the course? A. Yes, definitely, B. I think so,
C. Not especially, D. No. I wouldn't
- b1: The forest, mountains, roads and the like can be considered:
 A. Fixed, B. Transient, C. Abrupt characteristics.
- b2: On the trail bike, we must rely more upon: A. Seeing, B. Hearing,
 C. Balancing, than we do in the car.
- b3: On the logging road, how has the environment changed from the hiking
trail? A. Hills and curves, B. Evidence of more use, C. Posted road
signs
- b4: When we went from the logging road to the gravel road, what factor
most changed the driving environment? A. We were forced to slow for deep
gravel, B. Visibility was impaired, C. Gravel offered poorer traction,
 D. Driving becomes a social act
- b5: What must man do first to react to the environment? A. Adjust,
B. Decide, C. Identify

- b6: Which is the most important difference between these two environments?
A. Traction, B. Width, C. Cues less formal, D. Number of road users
- b7: Which cues become more important in this environment? A. Hearing,
 B. Seeing, C. Balancing, D. Both A and C
- b8: Which are the formal cues? A. The hill ahead, B. The rules of
the road, C. The road signs and markings, D. All of the above
- b9: By following a truck at this distance we: A. Restrict our visual cues,
B. Can't easily pass, C. Must rely on informal cues
- b10: Which cue is least diminished: A. Seeing, B. Hearing, C. Movement,
D. Temperature
- b11: In this intersection, which is the most important cue? A. Pedestrian
about to cross, B. Amber traffic light, C. Left-turning car
- b12: This environment is largely "man-made". It is designed primarily
for: A. Pedestrians, B. Drivers, C. Many different users,
D. Commercial vehicles
- b13: Signal lights are used in this environment because: A. The lanes are
wide, B. They separate road user in the complex environment, C. There
are too many other visual cues, D. The visibility is poor
- b14: Which is the least important way in which they differ? A. Higher
speeds, B. Limited access, C. Separation, D. Wider lanes
- b15: Which factor makes the identify-decide-adjust process easier?
A. Increased speed, B. Lane separation and limited access, C. High
traffic volume, D. Emergency braking areas
- b16: In this driving environment, the best motto might be: A. Slow down
and live, B. Speed with safety, C. Match speed to traffic flow
- b17: In this situation, which is the most critical visual cue to the
changing environment? A. The speed limit sign, B. The brake lights ahead,
C. The destination sign
- b18: Fog is especially dangerous because of: A. Higher speeds,
B. Increased traffic density, C. Restricted visibility, D. All of the
above
- b19: In this situation, the best action to take would be: A. Stop as
quickly as you can, B. Slow gradually, turn on lights, C. Find a clear
lane and move through, D. Search for an escape route

b20: Which sense is most affected by the rain? A. Hearing, B. Traction, C. Seeing, D. Temperature

b21: Which part of the identify-decide-adjust process is affected first? A. Adjustment, B. Decision, C. Identification

b22: Which of these road surfaces is best when dry? A. Concrete, B. Rough asphalt, C. Smooth asphalt, D. All about the same

b23: Which road surface has the least traction when wet? A. Concrete, B. Rough Asphalt, C. Smooth Asphalt, D. All about the same

b24: In this environment, the most important driving task becomes: A. Following previous vehicle tracks, B. Maintaining traction and moving forward, C. Visually searching the environment

c1: You would: A. Cut in front of the exiting red car, B. Enter between the red car and the green car, C. Enter behind the green car, D. Exit and try again

c2: In freeway lane selection, which is the least important to consider? A. Other traffic, B. Your speed, C. Nearness to exit, D. Posted speed limit

c3: Which position seems right for the traffic flow? A. B. C.

c4: Which is the least important when selecting your speed on the freeway? A. Distance you have to travel, B. Traffic flow and volume, C. Weather and visibility, D. Posted speed limit

c5: What should you do? A. Sound horn, B. Change lanes, C. Continue tailgating, D. Increase following distance

c6: Under these conditions, what should you do? A. Decrease following distance, B. Increase following distance, C. Maintain same following distance

c7: Which is the least important in determining a safe following distance? A. Condition of the vehicles, B. Distance you have to travel, C. Weather and road conditions, D. Visibility

c8: What did the driver of the green car forget to do? A. Check blind spot, B. Indicate lane change, C. Check traffic ahead, D. Adjust speed

c9: What should you do? A. Ease up and let it in your lane, B. Ignore signal and go on, C. Change lanes as the other car does

c10: Tell me how you would exit? Photo A. Car changes lane to exit-cuts off other car, Photo B. Car in left lane ready to exit, Photo C. Two cars in left lane, Photo D. Car changes lane just before exit

c11: What should be your first reaction? A. Always identify potential hazards, B. Always expect the unexpected, C. Ignore distractions, D. All of the above

c12: What should he do? A. Turn right; circle block, B. Go straight ahead anyway, C. Wait for gap; then move left

c13: What would be your reaction? A. Keep drivers like that off the road, B. Tough luck, old man, C. Come on over, I'll hold back

c14: What should you do first? A. Turn on lights and windshield wipers, B. Reduce speed and increase space cushion, C. Prepare to leave the main roadway, D. Turn on radio for weather/road reports

c15: The driver should have: A. Slowed down; avoided hard braking, B. Increased speed, C. Increased turn angle, D. Realized the hazards of excessive speed

c16: What should you do? A. Complete your pass, B. Change lanes (criss-cross with the other car), C. Hit brakes; keep firm grip on steering wheel, D. Pull back into your lane immediately

c17: The environmental category is? A. High risk (Category IV), B. Nearly Ideal (Category I), C. In-between (Category II or III)

c18: The environmental category is? A. High risk (Category IV), B. Nearly Ideal (Category I), C. In-between (Category II or III)

c19: The environmental category is? A. High risk (Category IV), B. Nearly Ideal (Category I), C. In-between (Category II or III)

c20: The environmental category is: A. High risk (Category IV), B. Nearly Ideal (Category I), C. In-between (Category II or III)

d1: A good reason to give your car a "walk around" inspection is: A. Spot leaks under car, B. Check tire inflation, C. Make sure lights and windshield are clean, D. All of the above

d2: What is the proper way to wear safety belts? A. Seat belt a hand width from hips, shoulder harness snug across chest, B. Seat belt snug and low, shoulder belt a hand width from chest, C. Seat belt and harness both snug, D. Hand width of slack in both seat belt and harness

d3: Who should wear safety belts? A. All occupants, B. Driver only, C. Front seat passengers only, D. Full grown adults

d4: What are some reasons why safety belts should be used? A. It is sometimes better to be thrown clear in case of accident, B. They are unnecessary for short trips or low speeds, C. They cause driver fatigue on long trips, D. None of the above

d5: If all drivers and passengers used safety belts, what should be the main result? A. Reduce yearly traffic deaths by about half, B. No measurable effect, C. Decrease number of minor accidents, D. None of the above

d6: What do raised rear axles and oversized rear tires do to a car? A. Gives better visibility, B. Increases stability, C. Requires more attention to control, D. Gives better braking control

d7: What reduces your car's performance most? A. Mechanical defects, B. Lead-free gas, C. Styling, D. Age

d8: As long as treads are good you can intermix tires on your car: A. True, B. False

d9: What should maximum tire pressure be based on? A. Manufacturer's recommended levels, B. Condition of tread, C. Anticipated highway speeds, D. All of the above

d10: What is your car's stopping distance at this speed? A. 50 ft., B. 60 ft., C. 75 ft., D. 90ft.

d11: What is your car's stopping distance in this situation? A. 100 ft., B. 135 ft., C. 160 ft., D. 180 ft.

d12: What is the most important factor in your car's ability to stop on a dry road? A. Speed, B. Horsepower, C. Condition of tires, D. Weight of car

d13: What effect does a heavy load have on your vehicle? A. Accelerate more slowly, B. Take more distance to stop, C. Make steering difficult, D. All of the above

d14: How would you compensate for changing headlight beam angle due to heavy loads? A. Install load levelers, B. Adjust beam angle, C. Either of the above

d15: Will wind gusts have an effect on a top load or camper? A. Yes, B. No

d16: How should you compensate for your vehicle's limited acceleration at higher speeds? A. Reduce tire pressure for more traction, B. Use higher octane gasoline, C. Rely on higher horsepower engines, D. Allow more passing distance

- d17: What should you do when approaching the crest of a hill?
 A. Decelerate slightly, B. Maintain constant speed, C. Accelerate slightly, D. Sound your horn
- d18: What is the best way to control your vehicle's speed going down hill? A. Downshift and pump brakes, B. Apply continuous partial pressure on brakes, C. Pump the brakes, D. Downshift and apply continuous partial pressure on brakes
- d19: To maintain maximum control within the posted limits of a curve, you should: A. Decelerate slightly, B. Accelerate slightly, C. Ride the brakes
- d20: What fact confirms that night driving is more hazardous than day driving? A. Over half of fatal accidents occur at night, B. Headlights are bright enough, C. Less cars on road, D. None of the above
- d21: Where would you place this car? A. Category I, B. Category II, C. Category III, D. Category IV
- d22: In which category does this car belong? A. Category I, B. Category II, C. Category III, D. Category IV
- e1: Did I know more about driving on the day I got my license than I do now? A. Knew as much then, B. Know more now
- e2: Your placement on your learning curve depends largely upon which of these four things: A. Age, B. Intelligence, C. Appearance, D. Experience
- e3: The best way to be sure you don't forget is to: A. Repeat information many times, B. Take good notes, C. Be confident you can remember, D. Don't fill your memory with too much information
- e4: How should you adjust to factors that limit what you can see:
A. Be more alert and pay more attention, B. Reduce my driving speed, C. Both A and B, D. Neither A or B
- e5: What is Joe doing? A. Making an unwise decision, B. Exceeding his design limitations, C. Letting his emotions overcome his logic, D. All of the above
- e6: What is Tom doing? A. Using his time well, B. Driving defensively, C. Limiting his search pattern, D. Adjusting to his design limitations
- e7: What is David doing? A. Wasting time, B. Making up excuses, C. Accepting his design limitations, D. Being much too careful
- e8: When you are under strong emotional stress would you drive: A. Almost always, B. Frequently, C. Sometimes, D. Almost never
- e9: If you have attitudes that keep getting you into trouble you can change them: A. Always, B. Frequently, C. Sometimes, D. Almost never

- f1: Of the 55,000 annual fatalities, how many of these have alcohol involvement? A. On half, B. More than one half, C. Less than one half, D. One third
- f2: Of the weekly alcohol related traffic deaths, how many involved a legally drunk driver? A. 300, B. 35, C. 400, D. 450
- f3: What percentage of the dead drivers had other drugs but no alcohol in their systems? A. 10%, B. 15%, C. 20%, D. 25%
- f4: What is the most frequent factor contributing to fatal highway crashes? A. Hallucinogens, B. Prescription Drugs, C. Opiates, D. Alcohol
- f5: .192 pounds, .After dinner, .drinking--To slow down intoxication eat large portions: A. Citrus fruits, B. Green leafy vegetables, C. Lean meat, D. Breads
- f6: .140 pounds, .Has not eaten, .Gulps drinks--Will exceed .10% BAC if he drinks: A. 2 to 3 beers, B. 3 to 4 scotch & soda, C. 5 to 6 beers, C. 3 (4 ounce) glasses of wine
- f7: Approximately how long will it take before you get down to .05%: A. 3½ hours, B. 5 hours, C. 6½ hours, D. 8 hours
- f8: .150 pounds, .Full balanced meal, .6 ounces of 80 proof liquor consumed in one hour--What will your BAC be? A. Close to .10%, B. Well above .10%, C. Above .05%, D. None of the above
- f9: .Jazzed up on bennies, .Post Office closing, .Car ahead well below speed limit, .Cars on either side--Chances are he will: A. Maintain speed, B. Tailgate and honk, C. Drop back and wait, D. Forget Post Office
- f10: .Gulped last of 8 beers, .Accident ahead, .Emergency and damaged vehicles--Chances are he will: A. Slow down slightly and proceed through, B. Turn around and go back, C. Accelerate right through, D. Both A and C
- f11: The drug user most likely to be found driving under the influence of the drug is: A. The heroin user, B. The alcohol user, C. The LSD user, D. The barbiturate user
- h1: At this uncontrolled intersection, which car should yield? A. The red car, B. The yellow car
- h2: The diagram shows that: A. All driver errors are violations, B. Not all driver errors are violations
- h3: The walk-around check of the vehicle: A. Is important before backing, B. Serves as pre-trip inspection, C. Both A and B
- h4: Looking forward before the backing operation is complete: A. Is an unsafe habit and a driver error, B. Is safe if nothing is behind your vehicle, C. Is safe if a walk-around check was made

h5: Swinging wide on right hand turns: A. Enables you to safely clear the curb, B. Is a driving error, C. May be a violation, D. Both B & C

h6: Failure to make frequent checks of the rearview mirrors: A. Is a driver error, B. Is a traffic violation, C. Both A and B

h7: If Leon rear-ended the truck, the primary cause of the collision would be: A. Truck ahead stopped too suddenly, B. Improper following distance, C. Leon took his eyes from the road, D. Improper speed

h8: You could say that Leon's driving: A. Was skillful, B. Failed to allow for other driver's errors, C. Was good because of his experience

h9: Stopping with your wheels cut left while waiting to run: A. Assures you are ready to run safely, B. Allows you to quickly complete the turn when clear, C. Is a driver error

h10: Moving slower than the traffic flow: A. Is advisable in a heavily loaded vehicle, B. Could cause other drivers to make unsafe acts, C. Is always legal and seldom unsafe

h11: Permitting another driver error to involve you in a collision is: A. Often inevitable, but frees you of blame, B. Is itself a driver error, C. A traffic violation, D. All of the above

h12: Which driver error began the developing accident pattern?
A. Failure to fasten seat belts, B. Overbraking, C. Unguarded bridge, D. Excessive speed

h13: This booby trap, the unguarded bridge abutment was: A. A fact of life, B. A potential driver error, C. An engineering error, D. A primary cause of the collision

APPENDIX D

ITEM SUMMARY FOR EACH SECTION

ITEM SUMMARY FOR EACH SECTION

1	2	3	4	5	6	7	8	9
Section	Section Item #	Test Item #	Pre-Test Raw Score	% Getting Item Correct	Inst Item Raw Score	% Getting Item Correct	Post-Test Raw Score	% Getting Item Correct
MM7a	1	44	52	85	55	90	59	97
(N=61)	6	2	22	36	52	85	60	98
	5	43	18	30	50	82	52	85
	8	9	51	84	50	82	57	93
	4				38	62		
	9				31	51		
	7	1	8	13	30	49	53	87
	3				28	46		
	2	31	19	31	27	44	57	93
MM7b	9				57	93		
(N=61)	15				56	92		
	23	4	23	38	56	92	56	92
	11				55	90		
	24				53	87		
	2				53	87		
	18	3	52	85	52	85	56	92
	17	45	46	75	52	85	61	100
	1				52	85		
	22	5	11	18	51	84	56	92
	12				50	82		
	19				49	80		
	10				49	80		
	20				49	80		
	16				48	79		
	3				48	79		
	7				47	77		
	13				47	77		
	5				46	75		
	6				45	74		
	21				45	74		
	4				41	67		
	8				40	66		
	14				40	66		

QUESTION SUMMARY FOR EACH SECTION

1	2	3	4	5	6	7	8	9
Section	Section Item #	Test Item #	Pre-Test Raw Score	% Getting Item Correct	Inst Item Raw Score	% Getting Item Correct	Post-Test Raw Score	% Getting Item Correct
MM7c	1				60	100		
(N=60)	7	38	35	58	58	97	56	92
	9				56	93		
	4	16	48	79	55	92	58	95
	10				53	88		
	18				52	87		
	8				51	85		
	15				51	85		
	16				51	85		
	5				49	82		
	6	6	27	44	48	80	46	75
	13				48	80		
	2	11	8	13	45	75	34	56
	12				44	73		
	20				39	65		
	14	7	16	26	37	62	44	72
	17				35	58		
	19				35	58		
	11				33	55		
	3				28	47		
MM7d	1	8	59	97	56	100	59	97
(N=56)	4				55	98		
	8				55	98		
	3	10	59	97	55	98	59	97
	6	13	54	89	55	98	59	97
	5	12	47	77	53	95	57	93
	16				53	95		
	15				52	93		
	13				52	93		
	20	17	30	49	51	91	55	90
	2				51	91		
	11				50	89		
	18				49	88		

QUESTION SUMMARY FOR EACH SECTION

	1	2	3	4	5	6	7	8	9
Section	Section Item #	Test Item #	Pre-Test Raw Score	% Getting Item Correct	Inst Item Raw Score	% Getting Item Correct	Post-Test Raw Score	% Getting Item Correct	
MM7d (Contd)	22				47	84			
	21				46	82			
	7				45	80			
	9	14	14	23	43	77	48	79	
	19				43	77			
	10				42	75			
	14				42	75			
	17				41	73			
	12	46	22	36	29	52	46	75	
MM7e	6				53	93			
(N=57)	5				51	90			
	7				51	90			
	1	28	55	90	50	88	57	93	
	2				50	88			
	8	19	54	89	47	83	54	89	
	3				46	81			
	4	18	49	80	41	72	55	90	
	9				39	68			
MM7f	4	20	23	38	56	92	56	92	
(N=61)	1	21	34	56	56	92	41	67	
	9				53	87			
	5				52	85			
	11	22	49	80	52	85	59	97	
	8				50	82			
	2	15	15	25	44	72	51	84	
	6				44	72			
	7				44	72			
	3				42	69			
	10				25	41			
MM7h	1				58	95			
(N=61)	2				58	95			
	10				57	93			
	6	40	34	56	55	90	56	92	

APPENDIX E

OBJECTIVE ANALYSIS SUMMARY

OBJECTIVE ANALYSIS SUMMARY

<u>Task Level</u>	<u>Content Type</u>		<u>Test Items</u>	<u>Inst Items</u>
I. THE PROBLEM				
RpG	Prin	A. Objective I: The student will be introduced to (1) the traffic problem and (2) a logical approach to traffic safety.	1, 2	
RpG	Prin	B. Objective II: The student will demonstrate his knowledge of those actions which he should take to solve the problem.		
II. THE ENVIRONMENT				
RpG	Prin	A. Objective I: The student will demonstrate his awareness of how hazardous environmental conditions may affect the driving situation.	17	b1, b2, b9, b20, h13
RpG	Prin	B. Objective II: The student will demonstrate his awareness of the hazardous environment produced on a freeway and its effect on his driving safety.	11, 24, 16	b15, b16
RpG	Prin	C. Objective III: The student will demonstrate his knowledge of how hazardous environmental conditions may be minimized.	6, 7, 18	b5, b19, b21, b24, c1, c3, c5, c8, c9, c10, c11, c12, c13, c15, c16
RpG	Prin	D. Objective IV: The student will demonstrate his knowledge of how the environment affects his driving situation.	3, 4 5	b3, b4, b6, b7, b8, b10, b11, b12, b13, b14, d17, d18

<u>Task Level</u>	<u>Content Level</u>		<u>Test Items</u>	<u>Inst Items</u>
		III. THE AUTO		
RpG	Prin	A. Objective I: The student will demonstrate his knowledge of the proper use of restraining devices.	10, 12	d2, d5
RpG	Prin	B. Objective II: The student will demonstrate his awareness of how a vehicle's condition can affect his ability to control the vehicle and/or contribute to a potential accident.	13, 14, 25, 26, 8	d7, d10, d11
RpG	Prin	C. Objective III: The student will demonstrate his knowledge of how the vehicle's condition can affect the driving situation.		d13, d14, d15, d16, d21
		IV. THE MAN		
RpG	Prin	A. Objective I: The student will demonstrate his knowledge that man has control over many of the conditions which result in accidents.	9, 46	d19, e5, e6
RpG	Prin	B. Objective II: The student will demonstrate his knowledge of limitations exhibited by various age groups of motor vehicle operators.		
RpG	Prin	C. Objective III: The student will demonstrate his knowledge of how he may counteract certain limitations of man.	29, 30	e7
RpG	Prin	D. Objective IV: The student will demonstrate his awareness of how alcohol and drugs affect his capabilities as a motor vehicle operator.	15, 20, 21, 22	f9, f10

<u>Task Level</u>	<u>Content Level</u>		<u>Test Items</u>	<u>Inst Items</u>
RpG	Prin	E. Objective V: The student will demonstrate his knowledge of how the driving situation is affected by man's physiological, psychological, and physical abnormalities.	19	
		V. THE TASK		
RpG	Prin	A. Objective I: The student will demonstrate his knowledge that the variable factors of the traffic mix will fluctuate and interact.	23	
RpG	Prin	B. Objective II: The student will demonstrate his knowledge that the task of driving a motor vehicle is the active involvement of the environment, the auto, and the man.		
		VI. TRAFFIC VIOLATIONS AND DRIVING ERRORS		
Rveg	Fact	A. Objective I: The student will demonstrate his knowledge of the five common traffic violations.	31, 38	h1, h7, h10
Rpeg	Prin	B. Objective II: The student will demonstrate his knowledge of the more common driving errors including the ability to differentiate between a driving error and a violation.	42, 41, 40, 39	h2, h11
RpG	Prin	C. Objective III: The student will demonstrate his awareness of the fact that by committing traffic violations and driving errors he is becoming involved in an accident pattern.	44	h9, h12

<u>Task Level</u>	<u>Content Level</u>		<u>Test Items</u>	<u>Inst Items</u>
		VII: EMERGENCY SITUATIONS		
RpG	Prin	A. Objective I: The student will demonstrate his knowledge that he must prepare for emergency driving situations. The student should be aware of the need to rehearse for a crisis at all times, plan an evasive action for all possible emergencies, and train his reactions in advance to make correct responses to emergencies.	32	
Rpeg	Proc	B. Objective II: The student will demonstrate his knowledge of the best course of action for him to take in a common emergency situation.	33, 34, 35, 36, 37	
Rveg	Fact	C. Objective III: The student will be able to identify those items considered as emergency equipment which should be carried in every automobile.		

I. TEST ITEMS NOT CONSISTENT WITH OBJECTIVES

Test Item	Objective
8. Rpeg/Concept	III B/C RpG/Principle

The objectives require the student to state why a procedure should be followed--the test item asks the student to identify or recognize examples of why.

Test Item	Objective
15. Rpeg/Concept	IVD RpG/Principle

The objective requires the student to demonstrate his awareness of how (why) factors affect his capabilities as a motor vehicle operator--the test item which asks the student to identify a specific figure which represents the number of alcohol related traffic deaths involving a legally drunk driver. Item 20 addresses the objective more appropriately.

Test Item	Objective
21. Rpeg/Concept	IVD RpG/Principle

The same objective as in 15 (above)--a test item again asking the student to identify a specific number.

Test Item	Objective
22. Rpeg/Concept	IVD RpG/Principle

Objective requires a paraphrased understanding of a generality, while the test item measures the student's ability to recognize a paraphrased example. Making a student aware that a driving drug user is most likely on alcohol does not talk to the objective of understanding how alcohol or drugs affect capabilities. It merely provides a list of descriptive statistics on him.

II. ITEMS NOT RELATED TO OBJECTIVES

27. The specific objective that this relates to is not present. May be good info for student/driver to know but does not fit in--objectives as they are stated.

28. Judgemental--not related to an objective.

43. Judgemental--correct answer is anyone's guess. Item does not relate to an objective--it, instead, relates to a basic assumption upon which the objectives and the curriculum were developed.

III. OBJECTIVES NOT ADDRESSED BY TEST ITEMS

IB, IIIC, IVB, VB, VIIC

IV. INSTRUCTIONAL ITEMS WHICH DO NOT HAVE OBJECTIVES

MM7a4
MM7a9
MM7c17
MM7c18
MM7c19
MM7c20
MM7e2
MM7e3
MM7e9
MM7f3
MM7f5
MM7f6
MM7f7
MM7f8