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AUTHOR

Daugherty, Ronald D.; And Others

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### ABSTRACT

This course guide for administrators and curriculum planners is intended for use with lesson plans for the instructor and a student study guide, available as VT 019 457 and VT 019 456, respectively. As part of a curriculum package developed by The Center for Vocational and Technical Education after a nationwide survey, this document contains information related to the field of accident investigation, a training plan with a course content outline and model schedule, personnel requirements, facilities and equipment requirements, instructional materials with sample lesson plans, and student study guide and evaluation information. Intended to develop entry-level skills and to train technicians to identify, collect, reward, and report data regarding the driver, vehicle, and environment as they relate to the pre-crash, crash, and post-crash phases of an accident, the course consists of five flexible instructional units. Each lesson plan provides teaching procedures, behavioral objectives, and suggested learning activities. A related document is available in a previous issue as ED 069 848. (DE)

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Highway Traffic Accident Investigation and Reporting:

COURSE GUIDE

Ronald D. Danghesty
Anne C. Haves
Sandra R. Guntsley

The Center for Vocational and Technical Education The Ohio State University 1960 Kenny Road Columbus, Ohio 43210

Gerenne 191

Prepared for:

U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
WASHINGTON, D.C. 20590

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# HIGHWAY TRAFFIC ACCIDENT INVESTIGATION AND REPORTING: COURSE GUIDE

Ronald D. Daugherty Anne C. Hayes Sandra R. Orletsky

Prepared for
U.S. Department of Transportation
National Highway Traffic Safety Administration
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U.S. DEPARTMENT OF TRANSPORTATION NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION WASHINGTON, D.C.



### **FOREWORD**

Transportation technology demands information. Most critical in highway traffic are the data and facts required to counter accidents. The Center for Vocational and Technical Education, through representation on the Traffic Education and Training Committee of the National Safety Council (NSC), noted the inclusion of accident investigation in the NSC's monograph Highway Safety Manpower and Training (18). Accident investigation was likewise noted in The Role of the Community Colleges in Developing Traffic Specialists and Technicians (3), a publication of the American Association of Community and Junior Colleges.

The Center conducted a nationwide inventory of sub-baccalaureate-level programs and training materials related to a variety of highway traffic safety occupations. Among priority needs was

training in accident investigation and reporting (5).

The National Highway Traffic Safety Administration (NHTSA) in the U.S. Department of Transportation administers nationally a state and community program referred to as Standard No. 18, "Accident Investigation and Reporting." It was in connection with this program that The Center for Vocational and Technical Education was contracted to plan and conduct an in-service instructor training course (6).

Resource materials or accident investigation techniques from a great variety of sources were evaluated as to suitability for a basic course, for intermediate courses, or for an advanced course.

The Basic Course: Instructor's Lesson Plans (8) and the Student Study Guide (7) are basic-level accident investigation guides referred to and described in the Course Guide. They were developed in conjunction with the national Accident Investigation Instructor Training Institute.

Robert E. Taylor
Director
The Center for Vocational
and Technical Education



### **ACKNOWLEDGEMENTS**

The project, "Accident Investigation Instructor Training Institute," was directed by Ronald Daugherty, assistant director of Field Services and Special Projects, The Center for Vocational and Technical Education. Project associates were Anne C. Hayes and Sandra R. Orletsky, graduate research associates. Kenneth Spooner, research coordinator, Vocational Education Department, University of Northern Colorado, served as evaluation consultant to ana-

lyze the evaluation of the project \*

The project staff was assisted by several individuals in the development of the accident investigation curriculum package, either by planning or through workshop participation. Appreciation is hereby extended to the following persons: Aaron Adams of NHTSA, who served as contract technical manager; regional workshop consultants Bernard T. Fagan, associate professor of trade and industrial education, University of Kentucky, Carroll Hyder, assistant professor, Department of Industrial Education, East Tennessee State University, and Ivan Valentine, professor of vocational research, Colorado State University; Richard Fredericks and John Keryeski from NHTSA who contributed to the technical review; and Sgt. D. G. Slemmer of the Ohio State Highway Patrol Academy, who centributed to the curriculum package and to the final technical editing.

The names of the 64 state and local instructors who represented 35 states at the regional workshops appear in the Appendix. These instructors also contributed to the original draft of the Instructor's Lesson Plans for the curriculum package.

The local host institutions for the five workshops were:

• The Atlanta Area Technical School, Atlanta, Georgia

- West Campus, Denver Community Colleges, Denver, Colorado
- City College of San Francisco, San Francisco, California

• William Rainey Harper College, Palatine, Illinois

Manchester Community College, Manchester, Connecticut

The technical reviewers of the Instructor's Lesson Plans were selected from the participants at the five workshops. They were: Glenn E. Clark, Karl Hutchinson, John Knight, H. Wayne Overson, Wayne Seal, and Irvin B. Smith. Photographs are courtesy of the State Highway Patrol of the Ohio Department of Highway Safety.

<sup>\*</sup> Information about this project can be found in Daugherty, Ronald D.; Hayes, Anne C.; and Orletsky, Sandra R. Accident Investigation Technician Instructor Training Institute-Final Report. Washington, D.C.: National Highway Traffic Administration, 1972. Available from the National Technical Information Service.

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HIGHWAY TRAFFIC ACCIDENT INVESTIGATION AND REPORTING: COURSE GUIDE

### **ACCIDENT INVESTIGATION**

Function. The growing need for accident investigation technicians in the United States has been established by various federal, state. and local government and law enforcement agencies. The manpower estimates for accident investigation technicians by 1977 are for 12,000 full- or part-time persons employed by state or local agencies (Highway Safety Occupational Program Development

Guide by Daugherty, Brooks, and Hyder, July 1971).

In recognizing the need for a coordinated highway safety effort. the Highway Safety Program Standard No. 18, "Accident Investigation and Reporting," has been developed by the U.S. Department of Transportation (Appendix). The new standard calls for all states to develop uniform comprehensive systems for the collection of traffic accident data. The training of basic-level accident investigation technicians to identify, collect, record, and report the cause of accidents is an essential phase of the overall highway safety pro-

The new Standard No. 18 made it necessary to locate substantive resource materials on accident investigation and reporting at the basic level. The principal sources tapped in the search for these materials were unpublished as well as published studies conducted under auspices of the National Highway Traffic Safety Administration. These studies consist of: (1) a task analysis for accident investigation technicians conducted for the National Highway Traffic Safety Administration by Battelle Memorial Institute, Columbus. Ohio, and (2) the training course materials developed by the Cornell Aeronautical Laboratory for training multidisciplinary teams of accident investigators.

Other principal sources utilized in developing the curriculum model were: the investigation and reporting procedures for the extensive files of incoming reports housed in the NHTSA, an analysis of the performance skills required, and course materials used in the training of the national research network of "multidisciplinary go-team" investigators. Complete references are to be found in the Accident Investigation Technician Instructor Training Institute-Final Report, available from the National Technical Information Service (6).

Figure 1 illustrates the adapted NHTSA model developed to train a basic-level accident investigation technician. The following is a description of the model.

### There are:

- 1. Three phases of accident investigation, consisting of precrash, crash, and post-crash
- 2. Three components of accident investigation, environment, vehicle, and driver



3. Four functions of the basic-level accident investigation technician, involving the skills necessary to identify, collect, record, and report (15)

Information gained about the pre-crash phase contributes to understanding accident avoidance, that gained about the crash phase contributes to injury prevention, and the knowledge learned about the post-crash phase helps reduce the severity of accidents.

Skillfull identification provides quick and complete surveys and analysis of complex situations. Selected items and conditions are accurately designated and defined. Skillfull collection requires priority decisions and results in the quantification and qualification of accident information times. frequencies, amounts, and distances. Skillful recording provides input materials to allow the

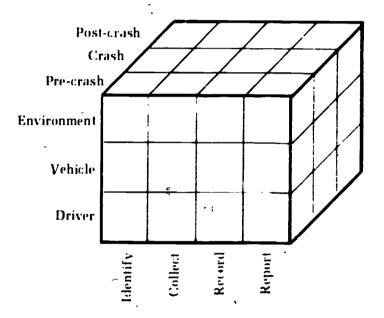


preparation and presentation of summaries of investigations of accidents. Field notes, sketches, and photographs are required documentation. Skillful reporting provides the end product or service. Oral briefings or written documentation are invaluable to understanding and allow continuing efforts for reduction of fatalities, injuries, and property damage.

Current literature in the field of accident investigation and reporting describes practices from the crudest to highly scientific computer modeling. This, along with the logical roles of the several agencies in both the private and public sectors, was considered in the determination of scopes and content of a basic-level course in accident investigation and reporting.

Manpower. It proved relatively easy to identify numbers of scientists and researchers, engineers, educators, and other authorities in the field. Labor force inventories and projections dealing with nonprofessional, i.e., technical manpower, applied man-year equivalencies or levels of effort rather than head-count data. Accident investigation and reporting was found at present to be a function within a broader function such as law enforcement. Police officers, among other duties, do accident investigation. A number of jobs or positions, such as traffic engineering technicians and emergency vehicle dispatchers, require, among other skills, a high degree of one or more accident investigation skills.

FIGURE 1
Matrix for Highway Traffic Accident Investigation and Reporting Curriculum



An additional type of job classification may be observed in public service or governmental agencies. It includes such positions as intern, assistant, or aide. Qualifications are comparable to the police patrolman, the emergency medical technician, the driver license examiner, traffic records, programmer, and others. It is for such in-service state and local agency personnel that training in skills of basic-level accident investigation and reporting will prove most beneficial.

Potential employers for accident investigation technicians can be found in four general areas: public service, commercial, manufacturing, and government. A partial listing of potential employers in each area might be as follows:

### Public Service

State police
City danners
Highway departments
Hospitals
Ambulance companies

### Magulactures

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Instructor Institute. A series of five regional instructor training institutes were conducted during the spring of 1972. The two overall pulposes of the porkshops were curriculum materials development and the improvement of participants' teaching skills. There were a total of 54 workshop participants representing 35 states. These individuals were primarily involved with some phase of police training police science, accident investigation, and traffic engineering programs at community colleges, police academies, or state highway paired academies. The average participant had slightly more than four years of accident investigation experience in addition to four years of teaching experience.

Of the 45 modules illustrated in the Figure 2 model, numerous modules isolated skills that obviously were identical to skills required of qualified police traffic patrolmen, although often at a higher level of suphistication than required to meet the objectives of this routed by was for this reason that instructional personnel, have indocement programs of selected community colleges, and positive academics were requested to contribute their skills and experience to the further development of lesson plans and student materials for this basic course. It required, in many instances, that new different and additional lesson material be developed and substituted, for familiar long-established lesson units that emphasized the law enforcement function.

The schedule used to develop curriculum materials was as follows (1) develop a curriculum model to include all available data and project objectives. (2) develop a proposed course content outlined for curriculum (3) establish criteria and select teacher educator consultants. (4) establish criteria and select workshop participants. (5) plan and conduct five regional workshops to develop assigned lesson units. (6) edit and revise draft lesson units, and (7) plan and conduct the follow-up technical editing workshop.



### TRAINING PLAN

Purpose of the Cours: Guide. This publication has been prepared in order to assist administrators and curriculum planners in organizing and conducting a course for basic-level accident investigation technicians. Included in the Course Guide is information related to the field of accident investigation, a training plan with a course content outline and model schedule, personnel requirements, facilities and equipment requirements, instructional materials with sample lesson plans, and student study guide and evaluation information. The Bibliography is limited to publications selected as being most significant to the course planning responsibility. The Appendix contains further accident investigat.on-related information such as Highway Safety Program Standard No. 18.

**Objectives.** The curriculum package has two major objectives: (1) to develop the skills essential for an accident investigation technician to possess for a basic-level position and (2) to train basic-level accident investigation technicians to identify, collect, record, and report data regarding the driver, vehicle, and environment as it relates to the pre-crash, crash, and post-crash phases of an accident.

 The technical functions are performed most effectively when an understanding and appreciation of related theories and knowledge are possessed.

The course is designed to emphasize the skills of investigation while avoiding direct involvement with actual accident situations, vehicles, or drivers. It is not dependent upon legal authority nor requirements to present evidence in court. On the other hand, provision is made through a Job Activity Sheet for trainees who, in the normal course of performing their work, have occasion to apply skills in an actual accident situation. The course assumes the trainee possesses normal abilities and understandings of the psycho-physical nature of humans and the common performance characteristics of vehicles, and that he is familiar with the system of urban and rural streets and highways.

The demonstration nature of the training precludes extensive treatment of theoretical materials or any but routine investigative functions. Examples are alcohol blood-equivalent testing and speed calculation by test skids.

Limitations. The content of the curriculum is geared to train personnel for basic-level accident investigation technician positions. Therefore, the curriculum is not appropriate for training higher



level technicians, such as experienced members of multidisciplinary accident investigation teams.

A further limitation is imposed by the fluctuating "state of the art" of accident investigation, which provides parameters within which this curriculum package must fit. Although this curriculum package is designed to teach the skills of accident investigation, it is not necessarily intended to be law enforcement-oriented. This orientation may pose some problems in implementing the curriculum at some institutions.

**Course Content.** The accident investigation course is organized to provide instruction in skills associated with facts and information identification, collecting, recording, and reporting. (See Figure 2. The course outline corresponds to the curriculum model previously described in Figure 1.)

The course consists of five lesson units involving a flexible number of training hours. The hours requirement was designed to be unspecified in order to provide the maximum flexibility for the curriculum. The first unit serves as an overview of the highway transportation system, emphasizing the purposes, responsibilities, and objectives of the accident investigation technician, as well as provides a general introduction to planning the investigation.



The second unit stresses the identification function of investigation as it relates to the driver, vehicle, and environment in examining for pre-crash, crash, and post-crash contributory conditions and causes as well as determining definitions and classifications.

The third unit emphasizes the learning of the skills an investigator must have in order to collect data through interviews, mea-



surements, photography, and determining speed estimates.

The fourth unit introduces the methods of recording accident data gathered through photography, field sketches, and interviews.

The fifth unit emphasizes concepts involved in accident reconstruction, reporting the investigation of an accident, and preparing and presenting the accident report.

Lesson Plans. The lesson plan topics are oriented to teacher and student activities, stressing skills required for an accident investigation technician to possess when identifying, collecting, recording, and reporting the necessary data as it relates to the driver, the vehicle, and the environment. The final lesson provides a simulated (mock) accident investigation situation in which the student can demonstrate the technical skills he has acquired through the course.

Each lesson provides an application phase to insure that the student becomes actively involved in the learning process.

The training class can be exposed to real life traffic accidents at the discretion of the instructor.

The course may be offered in conjunction with other courses in major areas, such as law enforcement, automotive, civil engineering, emergency medical care, etc.

Figure 2 presents a detailed outline of the course content for traffic accident investigation technician training as offered in the Instructor's Lesson Plans A descriptive statement for each lesson topic can be found in the Student Study Gaide.

### FIGURE 2

### Course Content Outline for Highway Traffic Accident Investigation and Reporting: Basic Course

### LESSON

### Introduction

- 1 Highway transportation system
- 2 Purposes, responsibilities, and objectives of the accident investigator
- 3 Plan the investigation

### Identify

4 Definitions and classifications

### The driver

- 5 Identify the driver
- 6 Identify pre-crash conditions of

### LESSON

- the driver, with reference to alcohol drugs
- 7 Identify pre-crash and postcrash conditions of the driver, with reference to emotions, fatigue, and physical illness
- 8 Identify behaviors as driver personality and attitude
- 9 Identify natural abilities of the driver
- 10 Identify learned capabilities of the driver
- 11 Identify persons other than the driver as potential sources of information

### LESSON

### The vehicle

- 12 Identify vehicle types and components
- 13 Identify pre- rash, crash, and post-crash vehicle damage and defects
- 14 Identify sources of injury to occupants and or pedestrians

### The enviornment

- 15 Identify and determine environmental atributes
- 16 Identify pre-crash marks on the roadway, shoulder, and environment
- 17 Identify position and angle of infliction
- 18 Identify debris
- 19 Identify vehicle parts with crash marks on the roadway & surrounding environment
- 20 Identify area of impact from marks on the roadway
- 21 Identify post-crash roadway marks in relation to the accidents

### Collect

22 Pre-crash and post-crash actions and reactions

### LESSON

- 23 Interview
- 24 Collect and preserve physical evidence
- 25 Make relocation measurements
- 26 Photograph
- 27 Make speed estimates

### Record

- 28 Introduction to Jethods of recording data
- 29. How to record via photography.
- 30. How to record via field sketches
- 31 How to record via notes from interviews

### Report

- 32 Reconstruction principles and causation analysis
- 33 Report the investigation of an accident
- 34 Prepare and present the accident report
- 35 Simulated (mock) traffic investigation

Model Schedule. Seventy hours of instruction are suggested. This represents the equivalent of a one-semester course with two-hour sessions twice each week. Figure 3 presents a model with hours assigned to classwork and laboratory or field work.

### FIGURE 3

# Highway Traffic Accident Investigation and Reporting Curriculum Model Schedule

HOU	J <u>RS</u>	UNITS		
Classwork	Lab or Field Work			
1 3	8	Introduction Identification	1-3 4-21	



но	URS	UNITS LESSONS		
Classwork	Lab or Field Work			
5	13	Collection	22-27	
5	13	Recording	28-31	
5	12	Reporting	32-34	
1	4	Summary and		
		Completion	35	
20	50			

Provision is made for in-service students whose routine duties provide real life experiences in one or more of the investigative skills, e.g., photographing accidents. Validated entries in the course's Job Activity Sheet may be substituted for laboratory or field work exercise. (See Student Job Activity Sheet, Figure 5.)

Methods of Instruction. The curriculum package is designed to assist the instructor in teaching the skills and knowledge necessary for the preparation of basic-level accident investigation technicians. It is emphasized that teaching should consist mainly of demonstration, with learning occurring through application and practice. Each lesson plan has a specific set of behavioral or performance-based objectives that attempt to encourage learning through student activity.

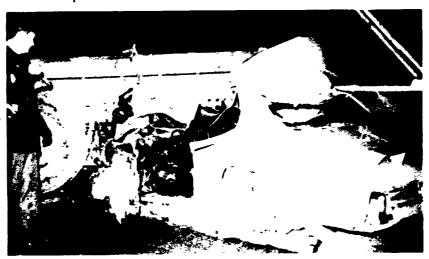
The less ins are not designed to be a complete blueprint or "how-to-do-it," step-by-step manual but are the best available expert suggestions for teaching the skills and knowledge necessary in the accident investigation field.

The curriculum materials are designed to meet the needs for preparing an individual for a basic-level accident investigation position. The objectives for each lesson plan are written in behavioral terms in an effort to reinforce the concept of learning through student-oriented activity as opposed to teacher-oriented activity. Included in this guide is a Job Activity Sheet that can serve as an individual progress chart for each student as he masters the skills necessary for basic-level accident investigation technician.

Reading references are identified for those students who desire in-depth study. Independent study may be required, depending upon the background the student brings into the course.

The authors envisioned something other than the traditional setting of the classroom when designing this curriculum. Mock simulation settings of traffic accidents, junk yards, and field trips were viewed as more effective settings for the successful implementation of this curriculum. While the nontraditional classroom

poses more of a problem for the instructor than the student, it was felt that this different and activity-oriented setting would do more to encourage and motivate the student to learn the lesson material through an application process. Much of the effectiveness of the course depends upon field work and group tours conducted to provide extemporaneous observations and narration.



Use of Lesson Plans. All lesson plans in the Instructor's Lesson Plans are designed to serve as guidelines for the instructor to use in teaching the 35 lesson topics on accident investigation. Creative approaches and innovations in teaching techniques are encouraged in an effort to stimulate learning and motivate the student. The objectives of each lesson unit have been written in behavioral terms. The lesson plans, therefore, reflect a student orientation and not necessarily an instructor orientation. Wherever possible, student activity and involvement are suggested. While the traditional lecture method is the easiest for the instructor to rely upon, the most effective learning occurs when the student is motivated through involvement in action-oriented activities. Learning by doing rather than learning by telling is a guideline suggested for this curriculum.

By informing the student at the outset of the instructor's objectives for each lesson unit, both the student and the instructor can work together to accomplish the stated objectives.

### **PERSONNEL**

Instructor's Characteristics. Instructors for the course should ideally possess prior experience and knowledge in the various areas of accident investigation. The course is designed with student performance of specific skills as a major objective. Therefore, it is essential that instructors of these curriculum materials be able to perform at least at the proficiency level desired of the trainee.

Instructors should be geared to helping students learn by expressing interest and offering guidance when necessary. Instructors should be committed to the philosophy upon which this curriculum is predicated. Specifically, this means that the learning process is enhanced by actively involving the student in curriculum-related activities as contrasted with the traditional lecture approach.

An unusual burden is placed on the instructor by making it necessary to identify, arrange, and utilize training resources that, though typical, are unique to a given community, e.g., traffic courts, frequent crash sites, and crash damaged vehicles. An energetic and imaginative individual is essential as instructor. A background of firsthand observations of crash occurrences and the aftermath in a variety of situations under differing conditions would permit the instructor to lend realism and practicality.

Course materials contain a minimum of reference to teaching methods and techniques. It is recommended that the instructor will have completed a course comparable to that published by the U.S. Office of Education, Preparation of Occupational Instructors

The Accident Investigation Technician Instructor Training Institute conducted by The Center for Vocational and Technical Education provided an opportunity for educators and non-educators to utilize behavioral objectives in developing curriculum materials as well as experience methods designed to improve teaching skills. Findings and supplemental materials can be found in the final report available from the National Technical Information Service.

Student's Characteristics. The course is developed with basic-level personnel in mind, although nothing precludes offering it as inservice training. The student must be capable of relating to people (driver) and understanding vehicle construction and performance (vehicles), and be familiar with typical streets and highways (environment). Beyond that, he must possess an aptitude for producing legible paper and pencil work, facility with the camera he will use, and ability to express concepts and ideas both orally and in writing.

The student is required to practice and perform the training tasks under conditions that often may be inconvenient, if not uncomfortable. Many of the units require that he sincerely play the role of an accident subject, a role that involves interviewing and simulating driver behavior and victim injuries.

The basic course provides only that the student deal with objectives and factual information. He will not be involved in assessment of courses, agency jurisdictional policies and practices, or implications of legality. It may be expected that the student will work under the direction of personnel, such as physicians, prosecutors, engineers, and policemen, whose authority and responsibility encompass such complexities.

### FACILITIES AND EQUIPMENT

Course arrangements are based on the assumption that a class-room-will be required. It will serve as a staging area and provide space for briefings, paperwork, and practice with equipment and instruments.

In general, drivers, vehicles, and roadways, which are always and everywhere at hand, will provide training resources. There is no necessity for the training groups to be involved in real life traffic accidents. Training in the skills, however, requires that drivers and driving behavior be observed and analyzed, that crash-damaged vehicles be studied, that injuries be noted, and that typical local highway characteristics and configurations become familiar. Field work under tightly controlled conditions is an essential requirement in meeting the objectives of the course. Arrangements with auto wrecking concerns, garages, street departments, ambulance crews, and court authorities are limited only by local ingenuity.

Standard classroom equipment is required, including chalkboards, opaque projectors, tape recorders, and increasingly common portable TV camera and playback equipment.

The identification unit of the course will require handbooks, specification charts, blueprints, labeling, and marking devices.

The collection unit of the course will require such measuring instruments as tape lines, marking crayons, labeling and marking devices, camera, specimen containers, and a watch. The recording unit will require sketch pads and sketching equipment, notebooks, camera, tape recorder, report form blanks, typewriters, and copying machines. The reporting unit will require drawing equipment models and mockups, maps, typewriter, and projection equipment.

Sufficient transportation for the class must be scheduled when field work involves travel to designated sites in the locality and for frequent observation and monitoring tours.

### **INSTRUCTIONAL MATERIALS**

Instructional materials are the published Basic Course—Instructor's Lesson Plans and the Student Study Guide. Great reliance is placed on the individual local instructor to search out and inventory meaningful current material to enrich each unit. Examples are photographs, slides, film specimens, investigation files and reports, and report forms. Locations for field work will have to be identified, arranged, and scheduled.

The instructor may be expected to possess an assortment of textbooks in the field of accident investigation. Required outside



reading is at a minimum but should be available to students who (1) possess less than usual experience or knowledge of driver, vehicle, or roadway. (2) desire to study theoretical aspects of accident investigation, or (3) desire to study specific applications to a particular jurisdiction or agency, such as police testimony in court cases.

Instructor's Lesson Plans. A lesson plan is provided for each of the 35 units of the course. The plans are organized in a uniform format to provide ready familiarity to the instructor throughout the course and to be convenient to follow while actually teaching.

Lessons are of two types—the manipulative skill lesson and the related technical information lesson. In both instances, lessons are organized for presentation in a sequence of phases or steps: (1) preparation of the learner, (2) presentation, and (3) application with suggested activities for student evaluation. (See an example of a lesson plan sheet in Figure 4.)

Published material references in most lesson plans are included to assist in the instructor's personal development and review. They are not intended for student reading assignments. Entries are limited to those readily obtainable by the instructor.

### FIGURE 4

### **LESSON PLAN 2**

UNIT Introduction

LESSON PLAN TOPIC Purposes, Responsibilities and Objectives of the Accident Investigator

OBJECTIVES The student will be able to.

- \*1 Explain the purpose of an accident investigator at the scene of an accident to the instructor's satisfaction
- 2 List the basic responsibilities of the accident investigator as outlined in the lesson
- 3 Explain the objectives of an accident investigator with the use of the four "E" concept

PREPARATION OF THE LEARNER

If you do have the responsibility for investigating traffic accidents, you will need to examine the accidents systematically and with some professional skill. We know that

- 1 All accidents are made up of a series of events
- 2 Certain links in this series of events are very important to determine the cause
- 3 It is hard to talk about the cause because, at times, there is more than one

Highway and traffic pattern improvement must be based upon accurate, factual information. But you cannot gather this information unless you know the part you are to play in the total traffic safety team. For you to perform efficiently you must



know what your job is before the emergency arises

Can you visualize this accident scene?

- 1 You are the investigator with no formal training
- 2 It is 11 15 pm and you go off duty at 11.30 pm
- 3 You arrive at the scene of the accident at the edge of the city limits
- 4 The cars are smoking
- 5 You see three motionless bodies
- 6 There are three injured persons pinned in the vehicle
- 7 The highway is blocked.
- 8 Bystanders are asking questions and making suggestions

### What training do you need?

- 1 P P rpose Why are you there?
- 2. R Responsibilities What are you trying to do?
- 3. O. Objective. What are you trying to accomplish and why?

Are you a PRO investigator? You can be! Let's discuss these questions.

### PRESENTATION

- I As a group discuss the following
  - A. What is the Purpose of the Investigator?

Why are (you, we) there?

- 1. Statute requirements to investigate.
  - a Death
  - h Injury
  - Property damage extent as required by law or where one vehicle must be towed away (National Standard)
  - d. State law
  - e City ordinance
  - f County regulations
  - g Law requirements
- 2 Departmental policy or procedure
  - a. Rules set out in your department regulations
  - b Special needs
- 3. Investigation:
  - a It is a careful and systematic inquiry into the facts and circumstances of accidents to discover causes
- 4. Determination of the cause
  - a. Not really an accident
  - b. Not an act of God
  - c. There is a cause or causes
  - d We do not have to accept accidents as the price of convenience of the automobile.
  - e Accidents can be prevented.
  - f. Accidents are the result of certain unexpected causes
- B. What are the Responsibilities of the accident investigator?

What are you going to do?

- 1 Proceed to the scene quickly but safely.
- 2 Secure accident-facts
  - a. In writing
  - b In sketching
  - c. In photographing
  - d. In interviews
- 3. Identify, collect, record and report all pertinent evidence



- 4 Meet state and local requirements
  - a. Statute laws
  - b City ordinances
  - c County ordinances
  - d. Departmental policy and procedure
  - e Supervisor's requirements
- C What are the Objectives of the accident investigator?

What are you trying to do as an accident investigation technician and why?

- 1 Enforcement
- a A complete investigation will suggest
  - (1) Cause(s) of the accident
  - (2) Violations of law
  - (3) Evidence facts for use in court against violator
- 2 Education
  - a Complete investigation will suggest needs for
    - (1) Driving improvements
    - (2) Hazald driving areas
    - (3) Basic needs for education in driver improvement areas
- 3. Engineering
  - a. These professionals use our investigative information to.
    - (1) Locate problem areas
    - (2) Determine where engineering work needs to be focused.
    - (3) Make their study of the problem location

### APPLICATION

Instructor: Use a transparency, chalk board, or felt board, etc., and have students summarize the purpose, responsibilities, and objectives of the accident investigator.

- 1 Display a "P" and ask students:
  - a. What does the P of PRO represent? (Purpose)
  - b Why are you at the accident scene? (Reconstruct the Purpose as set out in outline)
- 2 Display an "R" and ask students:
  - a What does the R of PRO represent? (Responsibilities)
  - b. What are you going to do at the accident scene? (Reconstruct the Responsibilities as set out in the outline)
- 3 Display an "O" and ask students
  - a What does the O of PRO represent? (Objective)
  - b Now that you are at accident scene, what are you going to do and why? (Reconstruct our objective from the outline)
- 4 What are the (4) four "E"(s) relating to accident investigation? (Place 4 "E" on board.)
  - a. Ask students to name each, put the word on felt beside an "E" and ask students to describe how accident investigation technicians assist in each
    - (1) E Enforcement
    - (2) E Enactment
    - (3) E Education
    - (4) E Engineering

### 4 Enactment

- a Result of our investigation the law makers determine
  - (1) Need for additional laws
  - (2) Revisions in present laws
  - (3) Legislation that is more applicable to problem
  - (4) Research basis for traffic records systems to several state local agencies (e.g. motor vehicle administration, public health—emergency medical and highway department)

### SUGGESTED REFERENCES

- 1 Baker, J. Stannard Traffic Accident Investigator's Manual for Police Evanston, Illinois The Traffic Institute, Northwestern University, 1971
- 2. Military Police Traffic Control Supervision Fort Gordon, Georgia.
- 3. Your State Statutes, City, and County Ordinances (Traffic Laws)

Student Study Guide. The student is provided the statement of the course objectives, the course outlines of lessons, the statement of lesson objectives, the assigned application, and the criteria for student accomplishment. Equipment, tools, and supplies are indicated.

As the course progresses, loose-leaf handout sheets can be provided by the instructor for inclusion in the Student Study Guide.

A feature of the Student Study Guide is the Job Activity Sheet, which provides those students who have the opportunity to put the skills of the course into use outside the class and to confirm and record the experience for recognition by the instructor and employer. (See Figure 5.)

Instructor-Developed Aids. While a variety of visual aids and equipment could be used to augment the lesson units at the discretion of the individual instructor, the development and use of supplemental information has been left up to the individual instructor. Some suggested equipment and visual aids are included with the lesson topics in the Basic Course—Instructor's Lesson Plans.

Much of the graphic arts material, such as charts and graphs, rapidly becomes obsolete. The same may be said for photographic materials. The instructor will find many sources in pamphlets, journals, and newspapers. For greatest effectiveness, material should use local drivers, vehicles, and highways so they will be familiar to the student. Exceptional items of student work from previous classes provide a rich store of instructional material for future use. Any slide collection used should be continuously extended and updated.

Reference Text Materials. No one specific textbook has been selected for use as an instructor's or student's reference in implementing the highway traffic accident investigation and reporting

curriculum. The instructor may recommend in specific cases that a student do study or research from a textbook that is readily available. There are a number of recommended commercially available texts that could be used to supplement curriculum development References from J.S. Baker's Troffic Accident Investigation Mensail have been cited for student use an connection with the Basic Course—Instructor's Lesson Plans. These suggested texts are listed in the Bibliography of the Course Guide.

### TRAINING EVALUATION

Evaluating the student's performance to ascertain whether he has met each objective can be accomplished in several ways. Each lesson topic has incorporated within it some form of application activity to determine an adequate performance level. There has been a concerted effort to restrict the use of the traditional true false, multiple-choice, or essay examination in this suggested curriculum. However, some topics more readily lend themselves to creative, nontraditional performance-level testing than others. The instructors are encouraged to use the application activities of performance techniques suggested in the lesson units rather than rely upon the standard testing methods.

The success of the course is determined by the ability of the student, upon employment, to deliver a product of a stated quality in an appropriate period of time, i.e., correct identification, accurately collected measurements, a legible sketch, or a factual written report. This is differentiated from the testing of the student's reten-

tion of information or knowledge.

The Job Activity Sheets allow evaluation of the student's product or accident investigation process. The course should be analyzed and evaluated at intervals to confirm that three factors are operating satisfactorily. Those factors are that: (1) the course content is appropriate for the aptitudes and abilities of the transecs: (2) only trainees who are capable of achieving the course objectives are enrolled; and (3) the instructions, including the facility and equipment, are all conducive to the anticipated learning and performance.

Provisions have been made for evaluating both the instructor and the course through the use of the Student Opinion of Teaching and Course Evaluation Form. This form can be found in the Appendix of each document in the curriculum package. The suggested use of this form is primarily for course revision over improvement of instruction.

A local advisory committee will prove very effective in not only evaluating the training course but also in providing initial guidance and continuing support.

PICHEE 1

Sludent Name

Beginney Traffic Accident leavestration and Reporting (ob Activity Short		Instructor	-
Assignd Activities.	Student Description of Articity as performed lettern merchanics	Completed	fastractor Comments
lessent transmer and laboral Pro- track track rosk and Prod track Columb Ortago and Defeats		um in	
Analyze a designated namine of solucies for the purpose of releativing egyster contained and settinger. Succeeding multiple imports			
Tesson 17 Identify Pre-Crash Marks on the Roadway Shoulder and Environment			
Identity through photography the following types of prestrash marks as found on the roadway highwas			
b Scottman		and d	
d Impending skid mark e Fire shadow mark		Da ba to a sa	
Franke mark			
Overlapping skid mark Skips k Test skids			
Lesson 23 Pre-Grash, Grash, and Post- Grash Actions and Reac- tions			
Submit in narrative form the reconstruc- tion of the crash from the first point of perception to the final position of the			·

<sup>\*</sup>These examples have been selected from the Highway Traffic Academt tovesty attangent Reporting Student Student Conde

### FIGURE 6

### **LESSON PLAN 26**

### UNIT Collect

LESSON PLAN TOPIC Relocation Measurements

OBJECTIVES. The student will be able to

- 1 Identify if the measurements at an accident are of positions which are temporary or short-lived in nature
- 2 Utilizing a mock traffic collision scene or scale diagram, each student will demonstrate to the instructor's satisfaction, two methods of making relocation measurements, including how, from what point, and to where they should be made.

### PREPARATION OF THE LEARNER

The recording of relocation measurements for a sketch of the collision scene is one of the important functions of an accident investigator in conducting a systematic inquiry into a traffic collision. Proper planning and sketching information is necessary to provide uniformity in reports and to avoid useless detail

Careful measurements take the guesswork out of locating positions of objects at the scene Reconstruction of the events of an accident from the first point of perception to the final position of the involved parties is derived from the measurements made by the investigator either at the accident scene or other locations as required PRESENTATION

- I. Need for Relocation Measurements
  - A Remove guesswork by recording measurements made at the scene
  - B Re onstruction of an accident scene
    - 1 For purposes of recording information
    - 2 For purposes of obtaining evidence

### II. What to Measure

### A. Purpose

- 1. To be able to relocate the position on a trafficway at a later date if it becomes necessary
  - a Reminder—it is always better to have too many measurements than to need one later and not have it
- B. Important measurements
  - 1 Point of impact
  - 2. Physical evidence
    - a. Skid and tire marks
    - h. Débris
    - c. Other factors relating to the collision
      - (1) View obstructions, etc.
- 3. Final position of vehicles or injured person

### III. When to Measure

- A Procedure
  - 1 Determine if the measurement needs to be made
  - 2 Determine the type of evidence present.
    - a Temporary in nature—last only few minutes
- b. Short-lived in nature—may last hours or even days

### **B** General

- 1. Taking measurements is only part of important duties at the scene.
  - a. Measurements may have to be taken after other duties completed.
- 2. Temporary evidence should be taken first.

- a Chalk or crayon may be used to mark the evidence until it can be measured and recorded
- 3 Check the scene before departing to insure all measurements have been taken

### IV Equipment

### A Materials

- 1 Tape measure
- 2 Procedures for pacing measurements
- 3 Visual measurements
  - a Known measurements of objects present at the scene may be used— Example
    - (1) The white (broken) lane lines are nine (9) feet in length with a fifteen (15) foot space in between.
  - (2) The reflective wedges are forty-eight (48) feet apart
- 4 Material by which to record measurements

### V Measuring Distances

### A General

- 1. Decide what is to be measured.
- 2 Have necessary tools available to accomplish task
- 3 Have adequate traffic control to assure safety of investigator

### B. Procedure

- 1. Short distances
  - a. Use a pocket-type tape
  - h Pacing method
- 2 Long distances
  - a. 100-foot tape
  - b. Pacing method
  - c. Odometer of vehicle

### VI. Accuracy of Measurements

- A The measurements taken are only as good as the accident site investigator and his tools.
  - 2. The measurements may be used in court.
    - a. The investigator will have no problems in court if accurate notes are kept.
    - b Measurements may be checked by a second person when they are made to insure accuracy

### B. Errors in measuring devices

- 1. Time and temperature affect devices—Example.
  - a A steel tape will have a two (2) inch error in 100 ft, when new
  - h. A cloth tape will have a three (3) inch error in 100 ft. when new
  - c A steel tape will lengthen ¼ of an inch in a temperature change from 0 to 100° Fahrenheit.\*

### C Errors made by investigator

- 1. Most errors are made by carelessness
  - a Mis-reading numbers
  - h. Losing count of the number when making long distance measurements

### VII. Methods of locating evidence

### A. Points of reference

- 1 Always use a permanent object to measure from
  - a Mile post marker
  - b Edge of roadway
  - c. Center line (or lane line)

d Curb edge

- 2 Do not use objects that are not of a permanent nature
  - a Telephone or power poles
  - b Mail boxes
  - c. Edge of driveways
  - d. Apex of a corner with no curbing
- B. Location by coordination
  - 1 Refer to a sample sketch on a transparency or draw a sketch on the chalkboard using the coordination method.
  - Coordination method used to eliminate clutter when there are too many measurements
    - a Letters are used instead of numbers at the location on the sketch for a measurement
    - b A legend on the sketch contains the measurements
  - 3 Complicated method of measuring
- C. Location by triangulation
  - 1 Refer to a sample sketch on a transparency or draw a sketch on the chalkboard using the triangulation method
  - 2. The triangulation method uses triangles to connect each spot with two permanent objects.
    - a. Separate triangle for each point to be measured
    - b Avoid slender triangles
- D. Location by reference point
  - 1 Refer to a sample sketch on a transparency or draw a sketch on the chalkboard'using the reference point method
  - 2 The reference point method is the most common type used
    - a Simple to use
    - b. Prevents confusion
- . 3 Measurements are taken from a permanent point and then all other measurements are made from that point

### VIII Recording Measurements

- A. Record measurements as they are made
- B. Identify measurements on a field sketch

### APPLICATION

- 1 The class will be taken to a mock accident site
  - Accident scene will have physical evidence present, vehicles, debris, etc.
  - b. Each student will demonstrate to the instructor's satisfaction how to relocate designated objects at the scene
    - (1) Each of the three methods shall be used.
      - (a) Coordination
      - (h) Triangulation
      - (c) Reference point
  - Each student will draw a field sketch to be submitted as prescribed by the instructor.

### SUGGESTED REFFRENCES

- 1 Baker, J. Stannard. Traffic Accident Investigator's Manual for Police Evanston, Illinois. The Traffic Institute, Northwestern University, 1971.
- 2 California Highway Patrol Manual Accident Investigation Sacramento, California, 1971

FIGURE 7

Highway Traffic Accident Investigation and Reporting Job Activity Sheet

Lesson 24: Make Relocation Measurements

Student Name:

Instructor:

	i	
Date Instructor Comments Completed and Evaluation		
Date	,	
Student Description of Activity As Performed (ettach necessary evidence)	-	
Assigned Activities	1 Submit one example each identifying if the measurements at an accident are of positions with Are a Temporary in nature b Long-lived in nature Explain why	2 Submit three field sketches, made at samulated or at actual accident seems, demonstrating the use of each of the following methods for making relocation measurements including from what point and to where they about he made a Coordinate h Trangulation t Reference point Reference point was selected for each example.

APPENDIX

### ROSTER OF WORKSHOP PARTICIPANTS

Each of the following individuals attended one of the five regional workshops and contributed to the development of the lesson plan units. We appreciate and acknowledge their contribution.

J. Thomas Accinosti Hiidson Valley Community College 80 Vandenburgh Avenue Froy, New York, 12180

Herbert Allen Peace Officer Instruction Lewis-Clark State College Lewison (Idaho) 83501 (208) 746-2341, ext. 326

James H. Amick, Sergeant Criminal Justice Academy South Carolina Highway Patrol 4242 Broad River Road Columbia, South Carolina 29210

Harry Babb, Captain-Suffolk Gounty Police Department c o State University of New York Agricultural and Techni al College Farmingdale, New York 11735 (516) 888 5543

Eugene L. Bell, Superintendent Vehicle Operations Harrisburg Post Office Harrisburg, Pennsylvania 17105 (712) 782-4436

Charles E. Blackstock Superintendent Vehicle Operations Knoxville Post Office Knoxville, Tennessee 37901 (615) 637-9300, ext. 4545

William F. Blumer, Instructor Police Science Fox Valley Technical Institute 1025 North Bluemound Drive Appleton, Wisconsin 54911 [414] 739-8831 Robert G. Bond General Foreman Vehicle Operations United States Postal Service Main Pos. Office Garage Terminal Annex Seattle Wa hington 98134 {2051442-2460

John I. Boots Preparatory Career Education Police Science Program Hawkeve Institute of Technology Waterloo, Jowa 50704 (319) 234-5951

William M. Brewer, Colonel and Director Department of Law Enforcement Mississippi Gulf Coast Junior College Jefferson Davis Campus Gulfport, Mississippi 39501 (601) 896-3355

John Bullaro Elmhurst Police Department 409 Canterberry Lane Oak Brook, Illinois 60521 [312] 323-4738

Clenn E. Clark, Instructor Law Enforcement Columbus Technical Institute 550 East Spring Street Columbus, Ohio. 43215 (614) 221-6743, ext. 75 Home. 231-8764

Thomas Connors Assistant Director Division of Social Science and Public Services 60 Bidwell Street Manchester, Connecticut 06040 (203) 646-4900



David I. Cox Hawan Community College 1175 Manano Street Hilo, Hawani 96720 Home 935-2581 Office 935-0091

Herman B. Davis, Instructor Department of Criminal Justice 500 Longview Road Longview Community College Lees Summit, Missouri 64063 SO3-7777, ext. 76

John Doyle, Instructor Police Science Mattatuck Community College 236 Grand Street Waterbury Connecticut 06702 (203) 757-9661

Hobart I. Erickson, Instructor Coordinator Police Science El Centro College Main and Lamar Dallas, Texas 75202 (214) 746-2360

Marvin Ericson, Instructor Police Science (former Chief of Westchester County Parkway Police) Westchester Community College 75 Grasslands Road Valhalla, New York 10595 [914] 946-1616

Wolcott S. Gains, Instructor Law Enforcement Technology Southern Main Vocational-Technical Institute South Portland, Maine 04106 (207) 799-7303

Peter Gardner, Instructor City College of San Francisco 638 Miramar Avenue San Francisco, California 94112 (415) 585-5055

Richard Helgeson, Attorney Law Enforcement and Business Law Instructor Clackamas Community College 19600 South Molalla Avenue Oregon City, Oregon 97045 (503) 656-2631

John P. (Jack) Hill: Colonel and Division Chairman Public Services Technologies Thomas Nelson Community College Riverdale Station, Drawer K Hampton, Virginia 23366 (703) 826-4800 Wallace Hughling, Chairman Law Enforcement Department, Phoenix Community College 1202 West Thomas Road Phoenix Arizone 85013 [602] 264-2498, ext. 357

Lee Hughs, Coordinator-Instructor Department of Criminal Justice Western Wyoming College 2500 College Drive Rock Springs, Wyoming 82901 [307] 382-2124 ext 51

Robert R. Hunter Clark College 1800 East McLoughlin Blvd Vancouver Washington 98663 (206) 644-6521

Karl Hutchinson, Coordinate Law Enforcement Ft Steilacoom Community College P. O. Box 3186 Tacoma, Washington, 98499 (206) 588-3623 or 582-5648

Robert Johnson, Instructor Law Enforcement Program Black Hawk College 6600 34th Avenue Moline, Hlinois 61265 (309) 755-1311, ext 210

Robert J. Kilpatrick, Assistan "Professor Florissant Valley Community College 3400 Pershall Road Ferguson, Missouri 63135 JA4-2020

Clarence F. Knight, Chairman Law Enforcement Education St Clair County Community College 323 Erie Street Port Huron, Michigan 48060 (313) 984-3881 ext 274

John Knight, Sergeant California Highway Patrol Academy 3100 Meadow View Road Sacramento, California 95832 [916] 422-5770

Newell G. Knight, Training Officer Utah Highway Patrol 309 State Office Building Salt Lake City, Utah 84114 [801] 328-5621



John Kocher Instructor Law Enforcement Lane Community College 4000 East 30th Avenue Eugene Oregon 97405 [504] 747-4501

Edward Lennox First Sergeant Maryland State Police Headquarters Pikesyille Maryland 21208 (301) 486-4101

Jerry W. Lockwood: Officer California Highway Patrol 8341 Indiana Avenue Riverside, California 92504

Gerald Marshall Corporal Vermont State Police St. Albans, Verme at 05478 (802) 483-6228

John McAlbster Northwestern Connecticut Community College Park Place East Winsted Connecticut 06098 (203) 379-8543

Kenneth L. J. M. Cormack Instructor Law Enforcement Alpena Community College 666 Johnson Street Alpena, Michigan 49707 [517] 354-3511

John Megerson Chairman Law Enforcement Program Dis Moines Area Community College 2006 Ankeny Boulevard Ankeny, Jawa 50021 (515) 964-0651

Arnold I. Miller
Chairman-Instructor
Department of Law Folorcement
and Administration
Arapahoe Community College
5900 So Santa Fe Drive
Littleton, Color ido 80210
(303) 761-2289

Marvin Mills, Professor Traffic Law Enforcement Marshall University Safety Education Department of Safety Education Huntington, West Virginia 25701 Paul H. Moore Coordinator Criminal Justice Program William Rainey Harper College Algonquin and Roselle Roads Palatine Himors 60067 [312] 359-3200 ext 463

Harry L. Myersohn, Captain Training Bureau Dade County Public Safety Department 1320 Northwest 14th Street Miami, Florida, 33125 (305) 377-7808

Floyd Nelson Vehicle Operations 550 Beale Street San Francisco California 94105 (415) 556-6499

Ralph O'Brian Materials Specialist Industrial and Technical Education Instructional Materials Laboratory U'niversity of Ken'io V Lexington Kentucky 30506 (606) 257-4730

H. Wayne Overson: Instructor Police Science Weber State College 3750 Harrison Boulevard Ogden: Utab: 84403 [801]: 399-5941

Harold D. Padley. Jr. U.S. Post Office 435 South St. Clair Street Toledo. Ohio. 13593 [419] 259-6457

James Pollard Instructor Spokane Community College 3403 East Mission Avenue Spokane, Washington 99205 (509) 456-2902

R. J. Prince, Resident Instructor Highway Patrol Academy Ridgeway and Eisenhower Drive Tallahassee, Florida 32 304 (904) 576-1244

James Rose Coordinator Adult Education Programs Athens Area Vocational-Technical School 11 S. 29 Athens, Georgia (3060) (404) 549-2360



Wayne Seal Sergeant and Training Instructor II Arkansas Law Enforcement Academy Post Office Box 3106 East Camden Arkansas 71701 (501) 574-1810

Irvin B. Sinith, I jentenant State Police Headquarters North DuPont Highway Dover Delaware 19901 (302) 678-4473

Ralph Strother Captain and Coordinator Traffic Safety Programs Department of Community Colleges Law Enforcement Training Room 173 Education Building Raleigh North Carolina 27610 (919) 829-7681

Cordon R. Tassi, Instructor of Police Science Cowley County Community College Arkansas City, Kansas 67005 [316] 442-0340

Robert Teets Instructor Police Science District 1 Technical Institute 620 West Clairemont Avenue Fau Chaire, Wisconsin 64701 [715] 834-317]

Harold Thogerson Instructor Lass Enforcement Portland Community College 12000 S. W. 49th Avenue Portland Oregon 97219 (503) 244-6111

Jim Todd: Executive Officer Lakeland Community College Mentor, Ohio: 44060 (216) 951-1000, ext. 243

Christopher Vail, Instructor Department of Criminal Justice Clayton Junior College Morrow, Georgia 30260 (404) 363-3800 Albert Vanderlande, Director Mitchell, Area Vocational Lechnical School Mitchell, South Dakota 57301 1605) 996-6671, ext. 24

Frich Wachsmuth Training Coordinator Pinellas Polici Academy Technical Education Center 6100-154th Avenue North Clearwater Florida 33516 [813] 531-3531

Keith Weaver Preparatory Career Education Police Science Program Western Toxia Tech 3075 Floyd Bouley and Sioux City Toxia 51105

Robert R. Westby Nocational Education Consultant Lass Enforcement Wisconsin Board of Nocational Technical and Adult Education 137 East Wilson Street Madison, Wisconsin 53705 [608] 266-7993

John E. Williams, Instructor Colorado Law Enforcement Tranning Academy 15000 Golden Road Golden, Colorado 80401 (303) 279-2511 ext., 237

Richard Wright, Director Law Enforcement Education Lively Area Vocational Technical Center 500 North Appleyard Drive Tallahassee Florida 32304 (904) 576-3181

Ben Yarbrough Director Central Savannah River Area Law Enforcement Training Center 1688 Broad Street Augusta Georgia 30904 (404) 738-5488



# HIGHWAY SAFETY PROGRAM STANDARD No. 18

# U.S. Department of Transportation National Highway Traffic Safety Administration Accident Investigation and Reporting

State highway safety program for axident investigation and report-Scope This standard estabhehes minimum requirements for a

bility for the investigation of acti-dents and subsequent princessing • of resulting data

5 Each State shall establish pro-

cedures for entering accident in-formation into the statewide traffic records system established pur-suant to Highway Salety, Pro-

gram Standard No 10, Fraffit

for gathering information—who what when where why, and how—on motor vehicle traffic accidents and associated deaths injuries the information into the traffic records system for use in planning, evaluating, and furthering highway If Purpose The purpose of this standard is to establish a uniform omprehensive motor vehicle traffir accident investigation program and property damage, and entering sheet program goals

Records, and for assuring uniformity and compatibility of this data with the requirements of the system, including as a

a Use of uniform definitions and

minimum

this standard the following III Definitions for the purpose

Manual

resulting in injury or damage, involving one or more motor vehicles on a highway that is Accident an unintended event definitions apply

r Fater into the statewide traffic system of information

records system

submitted to the

responsible State agency

gathered and

record.

into the statewide truffic

publicly maintained and open to the public for vehicular travel. Highway—the entire width be-tween the houndary lines of every way, publicly, maintained when any part thereof is open to the use

B Accident reporting Each State shall establish procedures which require the reporting of accidents to the responsible State

drivers or owners of motor vehicles involved shall be required to immediately notify the police of involving [1] fatal or nonfatal personal injury, or (2) damage to the extent that any motor vehicle own power, in its costomary man ner, without further damage or hazard to itself, other traffic ele-ments, or the roadway, and therethe jurisdiction in which the accident occurred. This includes but is not limited to accidents involved cannot be driven under its 2 In all other acadents the fore requires towing

D. Academ investigation. Each State shall establish a plan for account dent investigation and reporting which shall ineet the following Criteria dassifications acceptable to the National Highway Triffic Safety Administration and identified in the Highway Safety Program h A standard format for input of

1 Police investigation shall be conducted of all accidents as identified in section IV.C.2 above information gathered shall be consistent with the police mission of detecting and apprehending law violators, and shall include as

a minimum the following a Violation[s] if any occurred of section and subsection numbers and titles of the State

larity of design traffic engineering characteristics or environmental conditions and that bave a significantly large or dispro-portionate number of accidents a locations that have a sum-

cle parts that are involved in a significantly stange of despeosignificantly darge of desprob Motor vehicles or motor vehi injury-producing a cidents c. Drivers pedestrians

vehile or opants of a particular age, sex or other grouping, who are involved in a significantly large or disproportionate number of main vehicle traffic accidents or infures.

d Accidents in which causation or the resulting injuges at 5 property damage are not readily explainable in terms of conble in terms of con-or circumstances that prevailed ditions

e Other factors that concern emphasis State and natural programs

V Fvaluation The program shall be vealuated at least amonally by the State Substance of the evaluation report shall be guided by Chapter V of the Highway

ERIC

for purposes of of the public vehicular travel

or drawn by mechanical power manufactured primarily for use on the public streets reads and high-ways except any vehicle operated exclusively on a rail or rails Motor veha le-any veha le driven

designation with its political sub-designation, shall have an accident investigation program meeting IV Requirements Each State, in the requirements established here-

processing acceptant information and processing acceptant information needed by user agencies A Administration 1 There shall be a State agency having primary responsibility for administration and supervision of storing and

2 There shall be employed at all levels of government adequate numbers of personnel, properly trained and qualified to conduct accident investigations and process the resulting information

out the requirements of this standard in accordance with laws and policies established by State 3 Nothing in this standard shall preclude the use of personne other than police officers, in carry and or local governments .

4 Procedures shall be estab-lished to assure coordination, co-operation and exchange of in-formation among local, State and Federal agencies having responsi-

after impact

akenty within a reasonable tighe

ments to the responsible State dgenty A vehicle shall be considered adopte of being normally and safely driven if it does not require fowing and can be operated under its own power, it is customary manner, without further damage or hazard to itself other safely driven away from the scene, the drivers or awners of vehicles involved shall be required. in accidents involving only to submit a written report consistent with State reporting requiretraffic elements, or the roadway.
Each report so submitted shall include as a minimum, the following mormation relating to the accident Owner and driver reports property damage, where tan be normally sehir le

- a Location b Time
- c Identification of driver(s) d. Identification of pedestrian(s)
- passenger(s), or pedal-cy.
- e Identification of vehiclets)
  f Direction of travel of each unit
  k Other property involved
  b Environmental conditionsexisting at the time of the accident.

  A narrative description of the events and circumstances leading up to the time of impact, and immediately

Safety Program Manual The National Highway Traffic Safety Administration shall be provided with a copy of the evaluation report acode, that [1] contributed to the accident where the investigating offuer has reason to behave that violations were committed regardless of whether the offuer has sufficient evidence to prove the violation[8] and [2] for whether driver was arrested or cited

b. Information necessary to prove fense(s) for which the driver was affested or cited

e Information, collected in accordance with the program established under Highway Salery Program Standard No. 15, Police Traffic Services, section 1.0, relating to human, vehicular and highway factors causing individual accidents, injuries, and deaths, including failure to use safety betts

police, traffic highway and automotive engineering, medical, all behavioral, and social sciences. Data galbered by each member of the investigation team should be 2 Accident investigation teams shall be established representing different interest areas, such as notice, traffic highway and member's agency, and should be for the purpose of determining probable causes of accidents inconsistent with the mission of the probable causes of accidents in-puries, and deaths. These teams shall conduct investigations of an appropriate sampling of accidents in which there were one or more of the following conditions

### Student Opinion of Teaching and Course\*

Date	Ρ	
Inst	ructor	<del></del> ,
feel proj	to he important. Indicate your rating	of the Instructor aracteristic of instructors which students of your instructor by a check at the ap- point at which you rate is less important
	Exam	aple:
1	NOT HELPFUL	ACTIVELY HELPFUL
	te in after the question any additiona mples wherever possible.	l comments that you wish to make Give
1.	Is the instructor actively helpful whe	n students have difficulty?
	NOT HELFPUL Examples or Comments	, ACTIVELY HELPFUL
2	Does the instructor appear sensitive (	to students' feelings and problems?
	UNAWARE Examples or Comments:	RESPONSIVE
3.	Is the instructor flexible?	
	RIGID Example or Comments:	FLEXIBLE
4.	Does the instructor make students fe their ideas, etc.?	el free to ask questions, disagree, express
	INTOLERANT Example or Comments:	ENCOURAGES STUDENT IDEAS



<sup>\*</sup>Adapted from Wilbert J. McKeachie, Teaching Tips: A Guidebook for the Beginning College Teacher (Lexington, Mass. D.C. Heath and Company, 1969), pp. 247-252. Based on an evaluation form used by the Department of Psychology at the University of Michi-

	FAVORS SOME Example or Comments:	FAIR
	Is the instructor's speech adequa	te for teaching?
	UNINTELLIGIBLE Example or Comments (Volume,	GOOD Tone, Enunciation, Rate, Vocabulary, etc.)
	Does the instructor belittle stude	nts?
	BELITTLES Example or Comments	RESPECTS
		when they have done particularly well?
	NEVER Example or Comments:	ALWAYS
1	Does the instructor dwell upon th	ne obvious?
1	DWELLS ON OBVIOUS  Example or Comments.  Is the instructor interested in the	INTRODUCES INTERESTING IDEAS . subject of accident investigation?
	SEEMS UNINTERESTED Example or Comments:	SEEMS INTERESTEE
		amples or illustrations to clarify the material?
		4 '
	NONE Example or Comments:	MANY
1	· - · · <del>-</del>	,
. 1	Example or Comme.its:	rial in a well-organized fashion?
1	Example or Comments:  Does the instructor present mater  DISORGANIZED  Example or Comments:	,



့ ၀

	DULL		E ASSESSMENT OF SET OF SET			(	STIMULATING
	Example or Co	mments			•		
15	Does the instru	ctor put	his matei	ral across	ın an inte	resting wa	y?
	DULL					VERY	INTERESTING
	Example or Co	mments					
16	Other importai	nt charac	teristics-	please spe	ecify		
	Considering all that you added					pplicable (	including the se
		VERY	coon	GOOD	FAIR	POOR	VERY BAD



**BIBLIOGRAPHY** 



The references listed in the Course Guide include only a limited number of selections that are available to give prospective administrators, planners, and instructors an insight into the field of accident investigation Items are those selected from the extensive collection resulting from contract DOT-HS-115-1-169. The following are recommended as being of particular interest to administrators of highway traffic safety agencies and training institutions who contemplate initiating the Accident Investigation and Reporting: Basic Course.

More extensive reference lists for accident investigation are included in the Instructor's Lesson F ins and the Student Study Guide

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