Technical Report Documentation Page

1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.
FHWA/VA-86/20		

4. Title and Subtitle	5. Report Date
An Investigation of the Uses of Videotape in Transportation Operations	March 1987
	6. Performing Organization Code
7. Author(s)	8. Performing Organization Report No.
Michael A. Perfater & Gwendolyn Harris	VTRC 87-R20
9. Performing Organization Name and Address	10. Work Unit No. (TRAIS)
Va. Transportation Research Council Box 3817 University Station Charlottesville, VA 22903	11. Contract or Grant No. 2267
	13. Type of Report and Period Covered Final Report 2/86 - 3/87
12. Sponsoring Agency Name and Address Virginia Department of Transportation 1221 E. Broad Street Richmond, VA 23219	14. Sponsoring Agency Code

15. Supplementary Notes

In cooperation with the U.S. Department of Transportation, Federal Highway Administration

16. Abstract

This report presents the findings of a survey of how video technology is being used in the transportation industry nationwide. A search of transportation related publications was performed, and an inquiry was made of all state transportation departments regarding how videotape is being used to enhance the operations of those departments. Information was received from 42 of these departments.

The study reveals that videotape is being increasingly used by transportation agencies for training, the documentation of research, and for traffic studies. Several departments have replaced photolog systems with videolog systems that use videotape that can be converted to video laser discs. Twenty-five departments report frequent use of videotape, thirteen report occasional use and four report that implementation is imminent. Equipment investments ranged up to $200,000 with the average range being $30,000-$46,000.

17. Key Words	18. Distribution Statement
videotape, video laser disc, videolog, photolog, video technology	No restrictions. This document is available to the public through the National Technical Information Service, Springfield, Virginia 22161

19. Security Classif. (of this report)	20. Security Classif. (of this page)	21. No. of Pages	22. Price
Unclassified	Unclassified	184	

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FINAL REPORT

AN INVESTIGATION OF THE USES OF VIDEOTAPE IN TRANSPORTATION OPERATIONS

by

Michael Perfater
Research Scientist

and

Gwendolyn Harris
Research Scientist Assistant

(The opinions, findings, and conclusions expressed in this report are those of the authors and not necessarily those of the sponsoring agencies.)

Virginia Transportation Research Council
(A Cooperative Organization Sponsored Jointly by the Virginia Department of Transportation and the University of Virginia)

In Cooperation with the U.S. Department of Transportation
Federal Highway Administration

Charlottesville, Virginia

March 1987
VTRC 87-R20

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FINAL REPORT

AN INVESTIGATION OF THE USES OF VIDEOTAPE IN TRANSPORTATION OPERATIONS

by

Michael Perfater
Research Scientist

and

Gwendolyn Harris
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INTRODUCTION

Videotape is quickly becoming a basic communications tool for corporate, industrial, and government agencies. It is superior to conventional slide or movie film: there are no developing costs, playback is immediate, tapes are reusable, taping can be accomplished under low ambient light, audio can be easily dubbed or recorded, and tapes are inexpensive. For these and other reasons, transportation agencies are using videotape more and more to document and present research findings, provide training programs for employees, and record field operations. In an effort to assess the role of videotape technology in its operations, the Virginia Department of Transportation established a task group, which includes representatives from the Department and other state agencies who have expertise in video technology to evaluate the uses, benefits, and costs of videotape productions in the Department's daily operations. In order to help accomplish this, an investigation was made of the uses of videotape technology in state transportation departments nationwide. A review of transportation-related publications was also made. This report presents the results of that investigation and review.

PURPOSE AND SCOPE

The purpose of this study was to determine how videotape is used in highway transportation operations nationwide. This information was gathered by conducting a literature review and by surveying all state transportation agencies. The investigators sought to determine how videotape is being used by the transportation industry and what equipment is necessary to achieve various video applications.

METHODOLOGY

The initial information gathering effort consisted of the following:

1. A review of available transportation-related publications on video technology was conducted. This included a search of TRIS, NTIS, and COMPANDEX data bases using DIALOG Information Services Incorporated. Publications contained in the Virginia Transportation Research Council library were also reviewed, as were periodicals and publications produced by other states, professional organizations and vendors.

2. Each state transportation department was queried as to how videotape is integrated into its operations. A survey questionnaire (Appendix A) was sent which sought information regarding videotape use, personnel allocations, and equipment inventories. The survey also sought to ascertain each department's current or projected involvement with and opinion of videologging. Various materials such as videotapes, photographs, equipment specifications, and publications were also requested.

At the request of the FHWA monitor for the study, videologging and the use of video laser disc technology were investigated.

1. Telephone calls were made to each of the state agencies indicating on the survey that videologging was part of its operations. Questions were asked regarding the agency's videologging configuration. Literature and equipment lists were also requested.

2. Various data bases were searched using DIALOG Information Services to identify transportation-related publications on the use of video laser discs.

This report is divided into several segments in order to facilitate the inclusion of the information received from all sources. These segments include: (1) an overview of the information received in the questionnaires, (2) a description of video operations in each of the responding state agencies, (3) a description of the use of videologging and video laser disc technology (which includes several exhibits), (4) an annotated bibliography of the literature surveyed, and (5) an appendix that contains various videotape catalogs, which were received.

QUESTIONNAIRE RESULTS

Introduction

This section of the report discusses information obtained from questionnaires received from transportation departments in 41 states and the District of Columbia. It represents an overview of the uses of videotape in transportation agencies nationwide. It should be used as a cross

reference to the information contained in the following section of the report which presents a state-by-state overview.

Uses

Of 51 surveys mailed to transportation agencies in the states and the District of Columbia, 42 were returned. Twenty-five agencies reported frequent use of videotape, 13 reported occasional use, and 4 planned to use it. The frequency of use varied in relation to the number of years an agency had used videotape and to the availability of funding.

The most common use of videotape is for instruction and training (39 of 42). Videotape training programs are either self-contained or are used to enhance traditional training methods. First, experience has shown that videotapes keep students' attention longer than some traditional audiovisual training methods. As an educational tool, videotape has several advantages over traditional training tools. Second, it allows the student to proceed at his or her own pace. For example, instructional portions may be rewound and replayed until the student understands the material. Also, the tape can be interrupted so that the instructor may add amplifications or clarifications. Third, due to the relatively few pieces of equipment needed, (videocassette recorder, monitor, and appropriate videotape) classes can be held anytime and anywhere. Fourth, any type of instructional material may be put on videotape. It is especially useful for "how-to" instruction. Fifth, the use of videotape was found to be cost effective: it can eliminate costly trips to the field by bringing the field to the classroom, and copies of instructional videotapes can be made and distributed quickly and inexpensively.

The versatility of videotape makes it an ideal medium for documentation of field activities. Owing to the ease of making and storing videotapes, new construction techniques, procedures, and materials can be documented with videotape. Any portion of such a videotape can then be extracted and made (with appropriate narration added) to serve a variety of uses. Also, materials, equipment, management, and productivity at job sites can be preliminarily evaluated without the expense of sending an engineer or manager to that job site. Some transportation agencies are using videotape to spot-check contractors. In some state transportation agencies, experimental techniques are recorded and replayed at a later date to refresh engineers and workers as to how or when to correctly perform the technique. Videotape is admissible evidence in court; it has been used to clarify right-of-way lines, to monitor construction, to settle disputes between agencies and contractors, to provide intersection and traffic flow information for high accident locations, and to provide evidence in instances in which the agency has been accused of negligence owing to the interruption or rerouting of traffic.

One-half of the agencies surveyed used videotape to disseminate information. In these agencies videotapes are looked upon as simpler versions of complex written memos; they also attract more attention than a

written memo. The most common videotapes of this type are those concerning insurance and benefits, safety instruction, employee orientation and messages from upper level management.

Videotape also provides an excellent means for documenting and disseminating research results. It has proven very useful in recording actual experiments both in the field and in the laboratory. Most videotapes used for research documentation are produced in conjunction with written reports. Such videotapes are extremely helpful when presenting experimental results to departmental decision makers; they help present results quickly and efficiently while relieving the staff of reading a lengthy report. Videotapes are also useful for sharing research information with other agencies.

Videotape is used by 18 transportation agencies for traffic surveillance and counting. Almost any traffic data which may be obtained manually or mechanically can be obtained using videotape including traffic flow, traffic volume, brake light applications, compliance with traffic control devices, encroachments, erratic maneuvers, lane changes/merges, vehicle speed, traffic conflicts, vehicle classification, vehicle origin, vehicle occupancy, lateral placement, and time through intersection. The decision whether to use videotape or other collection methods is usually based on the availability of equipment and experienced and trained personnel, cost, urgency, accuracy and reliability of various methods, use of data, and local conditions. Although almost 100% accuracy can be obtained using videotape in traffic applications, many agencies report that data extraction is often quite time consuming.

Videotape is used by 17 state highway agencies in public service announcement productions and for other general work. These agencies produce everything from monthly thirty-minute programs to thirty-second public television advertisements; they have produced a history of the roadway, budget presentations for uses on news programs, and a series of programs explaining personnel benefits and issues to departmental employees, as well as public service announcements on traffic safety, drunk driving, the use of seat belts, littering, and road repair. Most television programs and advertisements are produced by the agency's training division, safety division, or Department of Motor Vehicles.

Videotape is used by many agencies to record meetings. The most common use for these tapes is to provide information to personnel who are unable to attend the meeting. High level agency meetings are also recorded to fully explain policy decisions to staff. Videotape is also often used merely to provide a permanent record of meetings.

Some agencies reported using videotape as a form of historical record. Videotape has proven to be an ideal medium to use for historical records because it has a long life-expectancy and requires relatively little storage space. Almost anything of historical value can be videotaped; the narration can be added as needed. Respondents reported that even state engineers and commissioners have been videotaped for the archives. Also,

historical buildings and bridges have been videotaped to record architectural style and to provide assistance in restoration efforts.

Costs

The investment in video equipment varies from state-to-state and is basically a function of the number of years video equipment has been used and how it is used. The state agencies which frequently use videotape have an average investment of $30,000 to $46,000 in equipment, although, in some cases the investment is as high as $200,000. Most agencies which employ videologging spend at least $10,000-$25,000 on videologging equipment which includes the outfitting of a videologging van. The use of video laser disc equipment increases these figures.

The initial video investment usually includes a camera, a videocassette recorder, and a monitor, which agencies usually already have in the form of a television. This investment grows as new capabilities such as editing are added. Most agencies which report moderate and large video investments have varying degrees of editing and special effects equipment. Thirteen agencies have editing capabilities which allow the production of broadcast quality programs.

Videotape Formats and Future Plans

Three basic videotape formats are used in the transportation industry: U-matic (more commonly known as 3/4"), VHS, and Beta. Each format has its own benefits and liabilities. The 3/4" format has editing capabilities superior to the 1/2" VHS and the 1/2" Beta formats; it also produces a better quality picture. The 1/2" format has the advantage of being smaller and lighter; its portability makes it more useful for field work. It is the format most commonly found on the consumer market and is usually the format most personnel have at home.

Most state transportation agencies have industrial (broadcast) quality equipment. This equipment is noted for its ability to produce clear, vivid pictures and to withstand the abuse of field work. Survey responses revealed that many agencies were well pleased with their video equipment and intended to purchase additional specialized equipment as funds become available. Most respondents also reported that additions to the equipment inventory have been a function of the amount of time the agency has used video equipment and its success with it. Most additions to equipment occur in the editing area. Many agencies found that when a basic editing system was in place, additional controllers, high resolution monitors, special effect generators, titlers, and personal computers became necessary. Newer, upgraded cameras are also often purchased once the basic video studio is established. These cameras vary in capabilities and price. Many agencies plan to expand the use of videotape into field offices and are presently buying cameras and VCRs for district and area headquarters. These cameras and decks are, for the most part, moderately priced and easy

to use. Some agencies are either considering or have purchased three tube cameras to use for studio work and special field work where very clear, high resolution pictures are needed. These cameras are 8 to 10 times more expensive than the single tube variety which most agencies usually procure in their initial video purchase. Most agencies also report that they have myriad varieties of lighting equipment, tripods, battery packs and cables.

Table 1

Format Breakdown

State	3/4"	VHS	BETA
Alabama		X	
Alaska	X	X	
Arizona	X	X	X
California	X		
Delaware		X	
Florida	X	X	
Georgia		X	
Hawaii		X	X
Idaho	X	X	X
Illinois		X	X
Iowa	X	X	
Kansas	X		X
Kentucky		X	
Louisiana		X	
Michigan	X		X
Minnesota	X		
Mississippi	X	X	
Montana	X	X	
Nevada		X	
New York		X	X
North Carolina		X	
North Dakota	X	X	
Ohio		X	
Oklahoma	X	X	X
Oregon	X	X	
Pennsylvania	X		
Rhode Island		X	
South Dakota	X	X	
Tennessee		X	
Texas	X		
Virginia	X	X	
Washington		X	
West Virginia		X	
Wisconsin	X		
Washington, D. C.		X	

DETAILED OVERVIEW OF STATE-BY-STATE USES OF VIDEO TAPE

Introduction

This section of the report presents an in depth look at the uses of videotape on a state-by-state basis. The reader should view this and the previous section of the report as cross references.

Alabama Highway Department

The Alabama Highway Department's use of videotape is at this time limited to the Materials and Tests Bureau. The Maintenance Bureau is in the process of ordering a complete video system to use for training purposes. The Department plans to equip all bureaus and divisions which demonstrate need with video equipment as soon as possible.

Alabama also plans to purchase video equipment to be used for video-logging. Equipment will include the following for use in the field: one van equipped with all necessary video equipment, a JVC 210 camera, Audio Technica AT805S microphone, Panasonic Vicon Electric Pan and Tilt, IBM Portable 5155 System Unit Model 76,3 JVC BR6200U 1/2" VHS recorder/players, 2 Panasonic CT 7711A 7" color monitors, vertical/horizontal curve instrumentation, and all needed cables and service manuals. Equipment for office use consists of the following: 13 Panasonic NV-8950 1/2" VHS dynamic tracking recorders, 13 Sony PVM-1910 19" color monitors, 1 IBM 3270 PC-AT 5273 microcomputer, and all needed software, cables, and service manuals.

Name of contact person:

Corey Clifton
State of Alabama Highway Department
1409 Coliseum Blvd.
Montgomery, Alabama 36130
(205) 261-6406

Alaska Department of Transportation and Public Facilities

The primary use of videotape in Alaska's Department of Transportation is the production of public service announcements. The most recent production is a sixty second spot on repaving and potholes. The state photographer handles all videotape needs which currently consumes 20-30 man-hours per year. The Department has no editing capabilities and must do post production work elsewhere. Approximately $25,000 has been invested in video equipment.

Major Videotape Components

Quantity	Description
1	Sharp XC 700 3/4" ENG color camera
1	JVC 6600 3/4" recorder
1	Sony VO-4800 3/4" portable recorder
1	Olympus VHS camera
1	Olympus VHS recorder
1	JVC color monitor

Future Plans: There are no plans to purchase additional equipment in the near future.

Name of contact person:

Robin Sheppard, Photographer
Department of Transportation and
Public Facilities
Pouch Z
Juneau, Alaska 99811
(907) 465-2171

Arizona Department of Transportation

The Arizona Department of Transportation frequently uses videotape for a wide variety of applications. Both 3/4" U-matic and 1/2" formats are used; the latter are predominantly used in field offices. Prerecorded tapes are used occasionally if the subject is of special importance to the Department.

Video needs are handled by a full-time staff which consists of a communications planner and a training specialist. These employees operate the cameras, edit tape, and write scripts. Additional help is provided by training officers and other personnel as needed.

Major Videotape Components

Quantity	Description
1	Sony M3A camera
1	Sony 6800 3/4" portable VCR
1	Sony VO-5850 3/4" edit deck
1	Sony RM 440 edit controller
1	Sony video projector
24	1/2" VCR cameras and recorders
15	Panasonic high resolution monitors
10	NEC monitors
2	hand held microphones
1	black and white 3/4" camera

Sound mixer
Lowell portable lighting kit
Videoshow computer graphic system

Approximate investment in video equipment to date: $70,000.

Future Plans: Future plans call for setting up a studio and starting a library.

Most Frequent Uses for Videotape

Training: Used as a tool in many training programs to record role-play. Also used to tape new learned behaviors (after training).

Documenting Research: As archive tapes.

Recording construction: Special procedures projects. Legal documentation.

Troubleshooting: Documentation of tunnel under right of way for future litigation purposes.

Observing traffic: Counting traffic and recording traffic accidents.

Televising programs/ads: Public Service Announcements. The most recent deals with out-of-state registration of vehicles.

Recording meetings: Used for new policies, procedures, and techniques especially when consultants present information.

Disseminating information to field offices: Tapes of meetings that are of interest. Videotape has been used to explain benefits, show perceived employee needs, and to become acquainted through a show called "Say Hello."

Testing new equipment: Used for weigh in motion equipment evaluation.

Documenting field activities: Used to record new methods and procedures and historical information.

Name of contact person:

Judith Barrette
Employee Development Manager
Department of Transportation
206 South 17th Avenue
Phoenix, Arizona 85007
(602) 255-7613

Arkansas State Highway and Transportation Department

The Arkansas State Highway and Transportation Department has only recently begun using videotape. All equipment purchased thus far has been 1/2" VHS. (This information was obtained from 1985 Video Operations Survey performed by the Idaho Transportation Department.)

California Department of Transportation

The California Department of Transportation frequently uses videotape in its daily operations. All videotape needs are provided by the Motion Picture/Video Production Unit of Graphic Services. Currently two full time writer/producer/directors along with freelance production crews handle all the film and video needs from the script to the finished product.

A library of more than 200 videotapes is maintained, and most tapes used in California are produced in-house. The video equipment is broadcast quality and in-house editing is possible. The Department plans to purchase additional editing equipment, a computer, and a new lighting system.

Videologging was evaluated as a replacement for photologging, to be used predominantly to document roadside development and for use in court cases. It was determined that the existing photolog system more effectively meets the Department's needs than a videologging system.

Name of contact person:

Gary Pund
Writer/Producer/Director
Department of Transportation
P.O. Box 1499
Sacramento, California 95807
(916) 322-8464

Colorado Department of Highways

Colorado uses the 1/2" VHS format. Three of the training staff are responsible for all the Department's video production needs, including script writing.

Major Video Components

Quantity	Description
2	Panasonic WV-3100 color cameras
2	Panasonic NV-8500 recorders
2	Panasonic CT-110 MA monitors
1	Panasonic NV-A500 editing controller
12	Sharp 19" television sets
13	Panasonic NV-8410 portable recorders
12	Panasonic NV-B55 AC adaptors
1	Panasonic titler
1	Quasar filmtape converter
1	Copy-mate enhancer
1	Video pointer
	Portable light sets

Connecticut Department of Transportation

The most extensive use of videotape by the Department is in conjunction with their second generation photolog. Data from the photolog is converted to videotape, which is in turn converted to Photolog Laser Videodiscs (PLV). These 15 discs store 1,620,000 photolog frames in less space than the old photolog system. This system, which has been in use about one year, is used to document longitudinal distance, sign inventory, roadside development, surface condition and pavement ratings, horizontal curvature, vertical curvature, azimuth grade, cross slope, roughness, and side friction. A four person staff is necessary to prepare the photolog for conversion to the laser discs. The staff includes one supervisor, two photolog technicians, and an engineer intern. Ultimately, twenty copies of the discs will be made for distribution to the Department's field offices.

Major Video Components

Quantity	Description
1	Ford Econoline E-250 Van
1	Automax GS-1R 35mm. camera
1	New Media Graphics GO 9500 Graphover
1	GTCO GT-100 graphics tablet
1	IBM PC-XT Model 68 computer
1	Mitsubishi M4851-125V second diskette drive
1	Segate ST-225 hard drive
1	Intel 8087 math co-processor
1	AST 6-Pack Plus multifunction board
1	Micro Way Mega Page extended memory board
1	AST Preview! PC-graphics board
1	Quadram amberchrome monochrome monitor
1	Epson FX-286 printer
1	Hitachi VIP-9550 laser videodisc player with remote control
1	Sharp XM-1300 13" color monitor
1	Cuesta Systems Corp. 40012060 Datasave 400/uninterruptable power supply

Setup, testing, installation, and instructional sessions were provided by the contractor.

Approximate investment in videotape equipment to date: $108,000.
Approximate investment in video photolog equipment to date: $375,000.

Most Frequent Uses for Videotape

Training: Viewing videotape programs produced by other agencies and companies that document research and new products. Viewing computer-software training aids.

Documenting research: Videotape dubs of CDOT research documentary films are produced for distribution to other agencies.

Observing traffic: Interstates and rail lines have been videotaped from aircraft for later use in traffic flow analysis and at public hearings.

Disseminating information to field offices: Videotape will be used to disseminate information and provide training to field offices.

Name of contact person:

James M. Sime, P.E.
Transportation Assistant Engineer
Department of Transportation
24 Wolcott Hill Road
Wethersfield, Connecticut 06109-0801
(203) 529-7741 X 61

Delaware Department of Transportation

The in-house production capabilities of the Delaware Department of Transportation are small due to the relatively short amount of time Delaware has been using videotape. There are no specific employees who are responsible for videotape needs at this time. In-house production is mainly limited to the Preconstruction Section, which makes videotapes for design reference. Pre-recorded tapes are mainly used by the Training Division. Both the Field Services Division and the Central District Engineer maintain videotape libraries which contain 40 and 50 tapes respectively.

The Department plans to institute videologging in the near future. Data to be retrieved will include roadside development, documentation of historical sites and recording roadside features prior to construction. There are also plans to convert 5,000 miles of data to video laser discs.

Major Videotape Components

Quantity	Description
1	Mitsubishi HS-330 Umatic recorder
1	Pentax PV-U1100 Avideo tuner
1	Pentax PV-R1100A portable VTR
1	Pentax PC-K1100A video camera
1	Quasar 19" television Monitor
	Various additional cameras, recorders, and monitors

Most Frequent Uses for Videotape

Training: How-to, and demonstration tapes especially for equipment operators.

Recording construction: Record complex or interesting operations.

Troubleshooting: Plan to use in the future.

Observing traffic: Videotape used to monitor traffic movements at intersections and entrances and to check traffic volumes.

Documenting field activities: Some before-and-after videotapes of construction projects have been produced. Videotape has been used to supplement survey notes and details.

Recording meetings and disseminating information to field offices.

Maintaining historical information.

Documenting research.

Name of contact person:

Temple Carter
Traffic Projects Engineer
Administration Building
P.O. Box 778
Dover, Delaware 19901
(302) 736-3308

Florida Department of Transportation

The Florida Department of Transportation frequently uses videotape in its operations. A staff of two are responsible for all of the Department's videotape and videologging needs. In approximately one and a half years, Florida has videologged both directions of 3,742 miles of primary and interstate highways. Items most commonly logged are roadside development and right of way boundaries. A videotape library containing 100 tapes is maintained.

Major Video Components

Quantity	Description
2	Panasonic WV555 cameras
4	Sony 5800 3/4" VCR's
1	Sony 5800 3/4" edit deck
1	Sony genlock computer
3	Sony CVM 1270 monitors

3	Panasonic AY-6300 1/2" deck
1	Paltex ABR-1A editor

Approximate investment in videotape equipment to date: $150,000

Future Plans: To purchase another camera.

Most Frequent Uses for Videotape

Training: Prerecorded videotapes are used in selected training activities.

Recording meetings: Various meetings within the Florida DOT have been videotaped if they are of special interest.

Name of contact person:

Donald I. Dobson
Engineer Tech. IV
Department of Transportation
Haydon Burns Building
605 Suwannee Street
Tallahassee, Florida 32301-8064
(904) 488-4752

Georgia Department of Transportation

The Georgia Department of Transportation's Public Information, Traffic Safety, and Systems Inventory units all use videotape. These units both produce tapes and use prerecorded tapes when necessary. A videotape library is maintained which contains approximately 100 tapes.

Videologging has been used for about a year and a half. A van is equipped to record longitudinal distance, a sign inventory, and roadside development. Approximately 1,200 miles of interstate and 17,915 miles of state routes have been videologged. Three originals are produced with each recording. A full time staff consisting of one vehicle operator and one camera operator are in charge of the videologging operations. The vehicle operator is in charge of the schedules and operates the vehicle when recording while the camera operator does all required video and computer work.

Major Video Components

A videologging system including a computer and step-van.
Various videotaping components (mostly JVC and Panasonic).
Approximate investment in video equipment to date is $100,000.

Future Plans: To purchase additional equipment to supplement that already on hand.

Most Frequent Uses for Videotape

Training: Training films have been produced and distributed to each resident engineer office.

Recording Construction: On every major traffic routing change during construction and on a monthly basis for possible litigation.

Observing traffic: Videotapes are often used to record large vehicle movements such as mobile homes.

Disseminating information to field offices and employees communication/personnel: Films covering safety and proper methods of installing signs have been produced for departmental and other uses.

Videologging: All interstates have been videotaped, and, as equipment is available, all state routes will be videotaped. This will replace the existing photolog system.

Name of Contact Person:

Jack Williams, Chief, Data Planning
No. 2 Capitol Square
Atlanta, Georgia 30334-1002
(404)393-4313

Hawaii Department of Transportation

The Hawaii Department of Transportation has overcome the logistical problem of being composed of four islands by initiating extensive training in the use of videotape equipment for Department employees. Offered twice yearly over the past two years, more than 200 employees have received basic video training while 50 have taken an editing course which trains them to use the Department's editing equipment. For special assignments a core group of 20 employees who have received advanced video training is called upon.

Major Video Components

JVC and Panasonic cameras (approximately 25)
JVC and Panasonic decks
JVC video editing system
Character generator
Sony VCR
Toshiba VCR
Microphones
Lights

Future Plans: Installation of additional editing studios on neighboring islands so staff will not have to come to Oahu for all editing and

post production work. The Department also plans to establish a videotape library.

Most Frequent Uses for Videotape

Training: Training sessions for crash/fire and bomb threat procedures.

Recording construction: Videotape is used to show various stages of construction for historical purposes and in case of disputes with contractors.

Observing traffic: Videotape is used to document problem areas.

Televising programs/advertisements: Public service announcements are produced.

Recording meetings and disseminating information to field offices: Record public hearings, informational meetings, legislative hearings, city council meetings on controversial subjects, and sharing of training information, etc.

Documenting field activities: Documentation of construction projects, problems, etc.

Maintaining historical information: Ground breaking and dedication ceremonies, project histories, etc.

Name of Contact Person:

Marilyn Kali, Public Information Officer
Department of Transportation
869 Punchbowl Street
Honolulu, Hawaii 96813
(808) 548-2268

Idaho Transportation Department

The Idaho Transportation Department uses videotape for numerous applications in its daily operations. The 3/4" format is presently used, but conversion to 1/2" VHS format is being considered because of recent improvements in it as well as its ability to contain more material than a 3/4" tape. Videotape needs are handled by a core staff of two with help (as needed) from eight additional department employees. The core staff consists of a videographer who edits, produces, and operates the camera in the field and office, and a scriptwriter who works thirty hours per week on scripts.

The Department produces mostly training tapes, although there is some production of general information and news-type programs which relay

information to management and staff. An extensive videotape library containing more than 275 tapes is maintained; most of these are produced by the Department. An occasional prerecorded tape is acquired if it is of special interest.

Videologging has been conducted for approximately two years. Longitudinal distance has been recorded in both directions for approximately 500 miles of interstate, 2,200 miles of U.S. highways, and 2,300 miles of state highways. The videolog system is similar to the existing photolog system except the medium used is videotape rather than film.

Major Video Components

Quantity	Description
2	Sony DX 1820 video camera
1	Sony 2600 video camera
1	Sony SEG 2000A special effects generator
1	Sony WEX 2000 wipe pattern extender
1	Sony control unit RM-440
3	Sony VO-5850 3/4" editing recorder/player
1	Tascam audio mixer
1	Sony Genlock graphics generator
1	Knox K-128B titler
1	JVC CP-5200U recorder
1	JVC CR-6060U recorder
12	Mitsubishi HS-318UR VHS recorder/player
1	Sony Beta I-II-III recorder/player
1	Sony Beta I recorder/player

Assorted monitors and older recording equipment
Approximate investment in video equipment to date: $100,000

Future Plans: To purchase a broadcast quality camera.

Most Frequent Uses for Videotape

Training: A video library of over 275 videotape programs containing everything from motivation, equipment operation, and in-depth lectures, to training philosophy, job instructor training, and train-the-trainer programs, etc.

Documenting research: Videotape is used to track various highway research projects such as before-and-after documentation of various patching materials and testing equipment usage in the field.

Recording construction: Several major construction projects, including bridges, are videotaped before, during, and after construction. These tapes are used to brief engineers and the Transportation Board, saving them the time they normally spend visiting these various projects.

Troubleshooting: Videotape has been used for surveillance to prevent theft of fuel and equipment at Division of Highway yards.

Observing traffic: Videotape has been used to monitor high accident locations and traffic movement, and to study sign and lighting needs.

Televising programs: Several public service safety announcements have been produced for the Department. Programs on winter driving, drinking and driving, and use of seat belts have been broadcast on television stations statewide.

Recording meetings: A number of programs featuring prominent speakers who lecture small groups of engineering and management personnel have been videotaped. The tapes are later made available to a broader segment of the staff.

Disseminating information to field offices and communicating with employees: Management, the Idaho Personnel Commission, and the Department of Insurance, have videotaped messages, which are shown to field personnel. The videotape library is also available to field personnel for information and training. Videotape is also used for disseminating late-breaking, important management information and for training.

Videologging: This activity has been ongoing for some time with many improvements in equipment and procedures.

Testing New Equipment: Videotape has been used to document brake testing on heavy trucks. Equipment operation procedures are also videotaped for demonstration to personnel in the field.

Documenting field activities: Slides and road closures are "spot-videoed" for use by television and for in-house documentaries and other programs. There is no specific schedule for videotaping such projects.

Maintaining historical information: Old buildings and bridges have been videotaped to provide a visual record of their existence. "Spanning the Canyon" is a historical documentary film produced on the Perrine Bridge on U.S. 93, north of Twin Falls in southern Idaho. The film has been transferred to videotape and has had many showings throughout Idaho and other transportation departments around the country.

Name of Contact Person:

Rick Gardner, Training Manager
Transportation Department
3111 W. State Street
P.O. Box 7129
Boise, Idaho 83703
(208) 334-3664

Illinois Department of Transportation

The Illinois Department of Transportation production needs are handled by the Illinois Information Service section of the Department of Central Management Services. The Illinois Information Service employs approximately 12 radio and television technicians and still photographers.

The Department of Transportation has purchased video equipment for nine district offices and five divisions. Various brands of cameras, VCRs and monitors are used in both the VHS and BETA formats.

Both prerecorded and self produced tapes are used by the Department. Training tapes are used to bring field and remote area work to the classroom. Tapes of construction are used to chronicle the progress of a project and for later reference. Documentation of field activities using videotape is available for public relations work and in-house viewing. Also, videotapes are used to maintain historical information.

Approximate investment in video equipment to date: $10,000

Name of Contact Person:

John Weir, Chief, Information Services
Department of Transportation
Administration Building
200 S. Dirksen Parkway
Springfield, Illinois 62764
(217) 782-6953

Iowa Department of Transportation

The Iowa Department of Transportation frequently uses videotape in its operations and is in the process of selecting equipment to replace its second generation 16mm photolog. A few miles of road have been ordered videologged for comparison purposes. It is anticipated that videologging will be used in the near future on detours and haul roads.

The Department has a complete production studio with dubbing capabilities in Ames and playback potential at 54 locations around the state. Recently the offices of Materials, Maintenance and the six districts acquired video cameras and recorders. New equipment plans include the purchase of additional 3/4" editing equipment.

A library of 200 videotapes is maintained. The Department uses both prerecorded and self produced tapes. Research documentation and research reports are produced on videotape and used at both state and national meetings. Training tapes, tapes of important meetings and personnel matters are also videotaped and sent from central headquarters to field offices.

Major Video Components

Quantity	Description
1	Hitachi 1010 camera
1	Hitachi SX80 camera
1	JVC 310 camera
2	JVC 8500 3/4" editors
1	JVC controller
1	Harris 516 time base corrector
2	Sony 3/4" recorders
5	JVC 6400 1/2" recorders
1	Sony 3/4" portable recorder
1	Hitachi 3/4" portable recorder
2	JVC 1/2" portable recorder
1	sound mixer
1	Sync. generator
10	3/4" videocassette players with 17" or 13" monitor/receivers
50	1/2" videocassette players with 17" or 13" monitor/receivers
1	3M special effects generator and switcher

Approximate investment in video equipment to date: $150,000.

Name of Contact Person:

George Norris, News and Information Specialist
Department of Transportation
800 Lincoln Way
Ames, Iowa 50010
(515) 239-1372

Kansas Department of Transportation

The Kansas Department of Transportation has a staff of three to handle its video needs. This staff is comprised of a supervisor (who is the head of the audiovisual unit) and an engineering technician; they handle the camera operation and the in-house production of videotapes.

The Department maintains a library comprised of 171 tapes; some are prerecorded tapes and some are produced by the Department. Both 3/4" U-matic and 1/2" Betamax formats are used. Some of the Department's videotape equipment was obtained in 1978 through a FHWA safety grant. This equipment is used extensively to produce training tapes for field and headquarters personnel.

Major Video Components

Quantity	Description
7	Sony SLP-300 Betamax players
1	Sony SLO-320 Betamax player/recorder
1	Sony VO-3800 3/4" portable player/recorder
1	Panasonic NV 9240 3/4" editor
1	Panasonic NV 9600 3/4" editor
1	Panasonic A-500 edit controller
1	BEI CG-410 character generator
1	Shintron VW-5500 special effects generator
1	Sony DXC 1610 camera
1	Hitachi GP-70 camera
7	Sony 17" color receivers
2	Sony 17" color monitor/receivers

Approximate investment in video equipment to date: $50,000

Most Frequent Uses for Videotape

Training tapes for construction and maintenance personnel include programs on safety, construction, materials testing, equipment maintenance and personnel supervisory training. Videotape is also used to record accident locations which are used by the legal staff in court cases.

Name of Contact Person:

Dan Plantz, Technical Support Supervisor
Department of Transportation
State Office Building
Topeka, Kansas 66612
(913) 296-3293

Kentucky Transportation Cabinet

The Transportation Cabinet of Kentucky recently purchased its first videotape equipment, thus the use of videotape has not been extensive to date. There are no in-house production facilities. New equipment and uses will be added as funding becomes available.

Major Video Components

Quantity	Description
1	Panasonic WV-3170-6X color camera
1	Panasonic NV8420 VCR

Most Frequent Uses for Videotape (Planned)

Training: Training tapes for maintenance workers in pavement operations.

Recording construction: Videotapes will be used to demonstrate safety procedures during construction.

Documenting field activities: Tapes will show pavement conditions to demonstrate resurfacing needs.

Name of Contact Person:

John Carr, Specifications Engineer
Transportation Cabinet
State Office Building
Frankfort, Kentucky 40622
(502) 564-3888

Louisiana Department of Transportation and Development

The Louisiana Department of Transportation and Development is an occasional user of videotape. An engineer IV and an engineering specialist III work approximately one day a month on varying video assignments. Most tapes produced are troubleshooting assignments, testing of new equipment, materials and procedures, and documentation of field activities. Prerecorded tapes are obtained if they are of special interest. A small videotape library is maintained.

The Department of Training and Safety has plans to use videotape extensively as a training aid. These plans include the conversion of multi-image slide safety presentations to 1/2" VHS videotapes which will be used in the nine highway districts by training specialists.

Major Video Components

Quantity	Description
1	RCA CC015 video camera
1	RCA TGP 1500 VCR
1	JVC AV 2000 video monitor
1	Panasonic 1/2" VHS video camera
1	Panasonic 1/2" VHS portable recorder/playback unit

Approximate investment in video equipment to date: $6,000.

Most Frequent Uses for Videotape

Training: To instruct field personnel in proper use of new equipment, materials, or procedures.

Troubleshooting: To troubleshoot field productivity problems. These problems involve equipment, materials, and manpower.

Televising programs/advertisements: Videotape equipment is used to record informative video conferences, programs, and advertisements related to maintenance operations (safety, litter ads, etc.).

Testing new equipment: Videotapes are made to test and document new equipment alternatives so as to compare features, cost, and productivity rates with existing equipment.

Name of Contact Person:

Robert Blouin, Assistant Road Maintenance Engineer
Kevin Murphy, Education Supervisor
Department of Transportation and Development
P. O. Box 94245
Capitol Station
Baton Rouge, Louisiana 70804-9245
(504) 342-7538

Maine Department of Transportation

The Maine Department of Transportation is in the process of exploring how videotape can be used in its operations and what equipment is needed. Initially, the operation of equipment will be the responsibility of existing personnel. Equipment will consist of basic playback units for division offices and cameras and editing equipment for the central office. Early emphasis will probably be placed on the use of prerecorded tapes. It is envisioned that in-house production will take place as needed equipment is purchased.

Most Frequent Uses for Videotape (Planned)

Training: Primarily for playback of commercial training tapes. Eventually training tapes will be produced in house.

Recording construction: To document unusual or potentially troublesome construction activities.

Observing traffic (including traffic counting): Field recording to be used for later analysis.

Troubleshooting: Documentation for use before Worker's Compensation Commission in cases where it is felt the system is being abused.

Name of Contact Person:

John M. Stanley, Assistant to Commissioner
Department of Transportation
Transportation Building
Augusta, Maine 04333
(207) 289-2672

Massachusetts Department of Public Works

Videotape is occasionally used by the Massachusetts Department of Public Works' Bureau of Transportation Planning and Development. It has been used for research documentation; the most recent such use was the videotaping of a reconstruction project as part of a research effort. So far, all video production work has been contracted out, and the Department has invested only $400 in videotape equipment.

Name of Contact Person:

Michael Meyer, Director
Bureau of Transportation Planning and Development
Department of Public Works
10 Park Plaza
Boston, Massachusetts 02166
(617) 973-7310

Michigan Department of Transportation

The video needs of the Michigan Department of Transportation are met by the photography section. A photographer devotes more than 100 hours per month to videotape work and operates all field and lab equipment.

The Department has in-house production facilities for 3/4" videotape. These productions have included training and safety tapes and tapes used in court cases. A video library containing 250 tapes is maintained. Copies of these tapes, both prerecorded and produced by the Department, are available to all Department supervisors.

Major Video Components

Quantity	Description
2	Sony DXC 1610 cameras
2	Sony 1/2" VCRs
	Panasonic monitors
	3/4" JVC editing equipment

Approximate investment in video equipment to date: $30,000-$40,000.

Future Plans: Future plans include the videologging of the railway system, and the purchase of new cameras, character generators, time base correctors and wave form monitors.

Most Frequent Uses of Video

Training: Videotape programs are used for employee and driver safety training and to train managers and staff at Michigan's Travel Information Centers.

Documenting research: Testing and research procedures are recorded.

Recording construction: Most recent is the videotaping of the Zilwaukee Bridge construction.

Observing traffic: Used to record traffic flow.

Televising programs/advertisements: Videotapes are produced for use in the state's information centers.

Disseminating information to field offices: Duplicate copies of training tapes are sent to district offices.

Name of Contact Person:

Jim Lawry, Jr., Manager
Photography Section
Department of Transportation
State Transportation Building
425 West Ottawa Street
P. O. Box 48909
Lansing, Michigan 48909
(517) 322-1671

Minnesota Department of Transportation

The Minnesota Department of Transportation uses both prerecorded tapes and those produced in house. A videotape library of 120 tapes is maintained. Most in-house productions are for information dissemination to

the workforce with playback possible at 16 different locations.

The video needs are met by a full-time staff which includes an audio-visual supervisor who manages the unit and all production, a scriptwriter who is in charge of all scripts, a student worker who is involved in production, and a producer/photographer who is also involved in production.

Major Video Components

Sony 5800 VTR
Sony 5850 VTR
Sharp 9000 camera
Sony 4800 VTR
ECS 90 Convergence editor
CEL-TBC
JVC 2000 switcher
Audio components

Approximate investment in video to date: $100,000.

Most Frequent Uses for Videotape

Training: Instructional programs including "how to" productions on equipment and safety operations have been produced.

Documenting research: Used mainly in the area of research and development on new equipment and techniques.

Televising programs/advertisements: Public service announcements dealing primarily with safety practices.

Communicating with Personnel: Used to deliver commissioner's messages and management views.

Name of Contact Person:

Gary Andrist, A/V Supervisor
Minnesota Department of Transportation
Transportation Building
John Ireland Building
St. Paul, Minnesota 55155
(612) 296-0841

Mississippi State Highway Department

The videotape needs of the Mississippi State Highway Department are met by a camera operator who works on an as-needed basis. Both prerecorded and in-house produced videotapes are used. Most in-house productions are requested by the Transportation Planning Division to aid in the evaluation

of new equipment. Documentation of some field activities and training programs are also frequently produced.

Videos will replace the existing photologs when funds become available. The new videologs will include a sign inventory, records of roadside development, and surface texture and pavement ratings.

Major Video Components

Panasonic CT-1930 monitor
Panasonic NV8420 recorder/player
Panasonic WV3240 12x camera
Panasonic NVB 58 AC adaptor

Approximate investment in video equipment to date: $3,900

Most Frequent Uses for Videotape

Training: Field crews and office personnel are shown tapes of new equipment. Also, certain field job sites are videotaped.

Testing new equipment: Tapes are used to evaluate equipment performance. One recent application was an evaluation of the Mays Ridemeter Tracks used to calibrate equipment.

Name of Contact Person:

Bill Norton, Engineer III
State Highway Department
P. O. Box 1850
Jackson, Mississippi 39205
(601) 354-7172

Missouri Highway and Transportation Department

The Missouri Highway and Transportation Department is currently seeking to expand its uses for videotape. In-house productions, which are the responsibility of various personnel whose primary job function is not video work, are on the increase. Most of these productions are for employee training and information. The Department also maintains a library of 75 videotapes.

Videologging has been used for six months to log airport runway and approach data. Pavement surface texture and pavement ratings data are logged for future analysis. Approximately 150 miles of airport runways and 150 miles of approaches to runways have been logged. Videologging is the responsibility of a senior airport inspector who operates the camera in the field approximately 25 hours a month.

Major Video Components

Quantity	Description
12	Panasonic WV3240 or WV3250 color video cameras
13	VCRs, receivers, and monitors of various brands

Approximate investment in video equipment to date: $40,000.

Future Plans: To purchase edit controllers for the main office and additional cameras and recorders for field use.

Most Frequent Uses for Videotape

Training: New employee orientation, and signal and radio repair training.

Recording construction: Major airport construction projects are taped for reference for updating the state airport system plan and airport safety data program.

Observing traffic: Recording peak period traffic conditions in metropolitan areas.

Televising programs/advertisements: Prerecorded public information programs are provided to local television stations and public schools.

Disseminating information to field offices: Indoctrination tapes are provided to district offices to inform them of the functions of the main office.

Communicating with Personnel: Employee orientations.

Videologging: Annual airport inspection is taped to provide a chronology of airport conditions.

Counting traffic: Traffic-turning movements and weaving volumes are recorded for later analysis in the office.

Documenting field activities: Tapes of conditions, problems, etc. are made to relieve administrative personnel of travel to the field.

Name of Contact:

W. L. Trimm, Division Engineer
Highway and Transportation Department
P. O. Box 270
Jefferson City, Missouri 65102
(314) 751-7306

Montana Department of Highways

Videotape is rarely used by the Montana Department of Highways. There are no personnel assigned to perform video work; the majority of it is performed by the Training and Public Information offices. Most videotapes used are prerecorded, since tapes produced by the Department must be edited by another agency. A small library includes tapes that contain training programs and public service announcements.

The department experimented with videologging but found it to be unsatisfactory.

The department has 3/4" RCA players in 12 offices. Headquarters contains both a 3/4" and a 1/2" RCA player. Cameras are borrowed when necessary.

Approximate investment in video equipment to date: $9,000.

Future Plans: To purchase a 1/2" camera.

Name of Contact Person:

Dennis J. Unsworth, Public Information Officer
Department of Highways
2701 Prospect
Helena, Montana 59620
(406) 444-6200

Nebraska Department of Roads

There is no video division at the Nebraska Department of Roads, nevertheless videotape is used for public relations work and training programs. Owing to the lack of in-house expertise and equipment, many productions are contracted out.

Major Video Components

Quantity	Description
40	television monitors
30	player units
10	recorder/player units
2	cameras

This equipment includes various brands and models and is located at various field districts.

Approximate investment in video equipment to date: $35,000

Future Plans: To purchase cameras for the eight field offices.

Most Frequent Uses for Videotape

Training: In-house programs created and shown within the Department, i.e., training of maintenance workers.

Observing traffic: Videotape has been used to monitor traffic at peak periods near project sites.

Maintaining historical information: Past directors and state engineers have been videotaped for a historical committee.

Name of Contact Person:

Larry Shafer, Division Manager
Information and Office Services
Department of Roads
P. O. Box 94759
Lincoln, Nebraska 68509-4759
(402) 479-4512

Nevada Department of Transportation

The Nevada Department of Transportation occasionally uses prerecorded tapes to aid in its day-to-day operations. Most tapes are used for research analysis and documentation, and there are no employees specifically assigned to oversee the video needs of the Department.

Videologging of the Nevada road system is currently under investigation.

Major Video Components

Quantity	Description
1	Panasonic NV1300 1/2" cassette player/recorder
1	Panasonic NV8410 Portapack recorder
1	Panasonic WV3100 color camera
1	Mitsubishi HS7800 Umatic recorder
	Various pieces of Sony reel-to-reel equipment.

Most Frequent Uses for Videotape

Training: Videotape is used to record participants in various classroom exercises.

Observing traffic: Data for turn movements and speed studies are collected and brought back to the office for further analysis.

Disseminating information to field offices: Tapes of interest to employees are sent to district offices for viewing.

Documenting field activities: Recent flooding was taped to document the need for emergency relief funds.

Name of Contact Person:

Robin Holabird, Public Information Officer
Department of Transportation
1263 S. Stewart St.
Carson City, Nevada 89712
(702) 885-5440

New Jersey Department of Transportation

The New Jersey Department of Transportation uses videotape extensively. Various department personnel aid a full time director and camera operator who handle the bulk of the department's video needs. Full in-house production facilities are available. The Department uses 3/4" U-matic, 1/2" Betamax, and VHS formats.

An extensive videotape library contains more than 7,000 prerecorded and Department produced tapes. The most extensive use of videotape is in the Research and the Training Units. The training unit uses commercially produced material in the Betamax format, while the research unit has 3/4" U-matic, VHS and Betamax capabilities.

Major Video Components

Quantity	Description
1	Beckman RMS-3030 multi-meter
1	Berkey LQF-6 studio lights
1	RCA TC-1006UZOC environmental camera
1	RCA TC-3251 time lapse recorder
1	Sampson 7310 tripod with fluid head
1	Sony CVM-1250 12" color monitor/recorder
3	Sony CVM-1900 19" color monitor/recorder
7	Sony DXC-1640 color cameras with accessories
1	Sony C-74 shotgun microphone
2	Sony VO-4800 Portapack with accessories.
1	Sony VO-6800 Portapack with accessories.
1	Sony RSC-1050 rotary shutter camera
1	Sony SVM-1010 high speed motion analyzer
1	Sony SEG-1210 special effects generator
1	Sony CG-101 sync generator
1	Sony DA-101 distributor
2	Sony VO-2860A editors
1	Sony RM-430 controller
1	Sony RX-353 auto search
1	Sony VPM-722QIHR video projector
2	Topaz 5112-6 inverters
2	Odetic G-77 timer

A research van equipped with AC generator, inverters, and platform is presently being equipped. The Department also plans to purchase a character generator, gyrolens, Sony 5850 editing system, high resolution television, additional cameras, and a VHS recorder/player.

Approximate investment in video to date: $100,000.

Future Plans: To use videologging and to expand in-house production facilities.

Most Frequent Uses for Videotape

Training: Various training seminars (on bridge inspections, computer operations, material testing, equipment installations, etc.) are videotaped, edited, and presented to employees.

Documenting research: Research projects, new materials, new equipment demonstrations, road conditions prior to construction, and land use are videotaped.

Recording construction: Construction activities on selected state roads and the interstate network are taped. These tapes are edited for training programs and study by research staff.

Observing traffic: Traffic surveillance is performed from stationary observation points, vans, and helicopters. Studies of complicated traffic circles, intersections, and passing lanes are also made.

Recording meetings: Selected meetings such as those between the Department and the FHWA or various public groups are recorded.

Disseminating information to field offices: Training tapes are shared among the four regions in the state. Other tapes might be shared with various local governments.

Counting traffic : Traffic volume, speed data, and lane distribution data are collected and analyzed.

Documenting field activities: A variety of research, maintenance, and design activities are taped and documented for future reference and evaluation. Tapes concerning noise mitigation are made for public meetings.

Maintaining historical information: Archaeological activities are taped and documented.

Name of Contact Person:

John Senyk, Project Engineer
Department of Transportation
1035 Parkway Avenue, CN 600
Trenton, NJ 08625
(609) 530-2992

New York Department of Transportation

The New York Department of Transportation uses videotape in a variety of applications. The Data Services, Traffic and Safety, and Transportation Bureaus maintain libraries of 24, 30+, and 20+ tapes, respectively.

Staff assigned to work with videotape equipment varies from bureau to bureau. Traffic Safety has two employees responsible for video work: a coordinator who schedules equipment and a camera operator who operates the camera in the field. A CEI operates a camera and a VCR in the transportation department. Trainers in the Staff Development and Training Bureau record classroom performance.

The use of videologging was evaluated by the department. The following quote was received. "To date, a portable video system capable of capturing a quality image equal to that of the 35mm film used in photologging is not available. Results of the evaluation of videotape vs. 35mm film is that film should be used for long-term inventories where accurate detail is needed; videotape should only be used for short-term studies that require temporary analysis."

Major Video Equipment

Quantity	Description
4	Panasonic WV-3250/8AF video camera
13	Panasonic NV 8420 portable VCR (11 with NVB58 AC adaptors)
2	Panasonic PV-1535 4 head VCR
2	Panasonic CT-1930V 19" color monitor
1	Panasonic AG 6200 1/2" VCR
1	Sony V05600 3/4" VCR
11	Panasonic CT 1930 V television monitor
2	NEC VC-7505 3/4" timelapse recorder
2	Panasonic NV-8050 1/2" timelapse recorder
2	Sony AVC-3260DX b&w camera
2	Sony CVM-19S b&w television monitor
1	Panasonic VHS 1/2" VTR
1	Panasonic CT-1930 V 19" television monitor
1	Newvicon stereo sound color video camera
2	Diamond STV-4 b&w camera

Approximate investment in video to date: $42,050.

Most Frequent Uses of Video

Training: Trainee performance is recorded and shown. Self-instructional tapes are also shown; one example is real estate building cost estimating.

Documenting research : Documentation of lab and field testing has proven to be an excellent tool when used to show results to department decision makers.

Observing traffic: The department monitors traffic study areas; it also makes vehicle classification studies and truck weight studies; further, it collects data on intersection operations/traffic flow.

Counting traffic : Monitor traffic study areas.

Testing new equipment: Videotape has been used to examine a new ramp-metering device.

Documenting field activities: Videotape is used to record the testing of roadside equipment.

Recording Construction: Various uses.

Troubleshooting: Various uses.

Recording meetings: Various uses.

Disseminating information to field offices: Various uses.

Name of Contact Person:

Tom Sweeney, Senior Transportation Analyst
Department of Transportation
1220 Washington Avenue
Albany, NY 12232
(518) 457-6186

North Carolina Department of Transportation

The North Carolina Department of Transportation has no formal videotape operation. The equipment available is limited to VHS cameras and recorders assigned to 14 division engineers. The tapes that are produced are used mainly for training and for office review of trips to the field. There are no plans to increase videotape use or equipment.

Name of Contact Person:

Charles Adkins, Manager of Planning and Research
Department of Transportation
P. O. Box 25201
Raleigh, North Carolina 27611
(919) 733-3141

North Dakota State Highway Department

The North Dakota State Highway Department frequently uses videotape in its day-to-day operations. The audiovisual unit's staff is made up of two scriptwriters and two production-helpers (all of whom work 20 hours per week) and one producer-director who works 40 hours per week. One production-helper works mainly with videotape and the other with slides, but as deadlines near, duties are changed as needed. The audiovisual unit is responsible for the video needs for all state agencies in North Dakota.

A 25' x 25' production studio is used for both videotape and slide/tape production. Color videotapes are produced and edited in 3/4" cassette format. Videotapes may be duplicated in the following ways: 3/4" cassette to 3/4" cassette, 3/4" cassette to 1/2" cassette, and 1/2" cassette to 3/4" cassette, 1/2" cassette to 1/2" cassette. The duplication of 1/2" reel-to- reel to 3/4" or 1/2" cassette, slides to videotape or 16mm film to videotape is also available.

The highway department uses both prerecorded tapes and tapes produced in house. A library of 300 videotapes is maintained.

Major Video Components

Quantity	Description
1	Sony DXC-M3A 3-tube color camera
1	Sony V06800 3/4" portable deck
3	JVC CR8300U 3/4" Helical Scan edit deck
1	Panasonic NV8200 1/2" recorder
2	Panasonic CT 1310 M 18" monitor
1	JVC RM834 edit controller
1	Sony TC 3884 reel-to-reel audio tape deck
1	TEAC A2340SX reel-to-reel audio tape deck
1	TEAC TASCAM 5 mixer
1	Sanyo turntable
1	Sony TC-1315D cassette audio recorder
9	1/2" playback and monitors
	Numerous microphones (shotgun and studio)

Approximate investment in video equipment to date: $60,000-$70,000.

Future Plans: To purchase new editing equipment, special effects generator, a graphics system, a time base corrector, and an additional 3-tube camera.

Most Frequent Uses for Videotape

Training: Videotapes are used to train part-time staff in materials testing. Twenty programs are in progress.

Documenting research: Recently used to record a concrete recycling project.

Recording construction: New bridge construction and other special projects are recorded.

Televising programs/advertisements: Public service announcements on drinking and driving, speed limits, safety during the holidays, and seat belts have been produced.

Recording meetings and disseminating information to field offices: Used to reduce travel time.

Communicating with personnel: Tapes on stress management, health issues, and retirement have been produced for employees. An orientation program for new employees has also been produced.

Name of Contact Person:

Terry Wiklund, AV Producer Director
State Highway Department
600 East Boulevard Avenue
Bismarck, North Dakota 58505-0178
(701) 224-2500

Ohio Department of Transportation

In the Ohio Department of Transportation, the Bureau of Traffic uses videotape extensively for various traffic observations. Videotapes are used by both the central office staff and the district offices. All districts have 3/4" players. The department has in-house facilities to transfer 1/2" tapes to 3/4". When needed, 1/2" equipment is borrowed.

Both prerecorded tapes and tapes produced in-house are used by the department. A videotape library of 400 1/2" VHS and 3/4" U-matic tapes is maintained. Videotape needs are met by a television and radio coordinator, who has a part-time commitment to video. Some in-house production facilities are available.

Major Video Components

Ford Step Van
Hitachi three-tube camera
RCA time-lapse recorders
Owan generator
Sony 19" color monitors
Video switcher
Knox character generator
Panasonic 1/2" portable recorder
Panasonic 1/2" camera

Approximate investment in video equipment to date: $115,000.

Future Plans: The department plans to purchase Sony M3A cameras, Panasonic time-lapse recorder, and a digital video camera.

Most Frequent Uses for Videotape

Training: Videotapes are employed for training in proper maintenance procedures.

Documenting research: Research projects involving new products and installations are often videotaped.

Recording construction: Videotape is used to document construction procedures and traffic control in construction zones.

Observing traffic: A van containing time-lapse videotape equipment is used to tape high accident locations and intersections for analysis.

Counting traffic : Videotape is used to record data for traffic counts, conflicts, signal timing, and delays.

Documenting field activities: Videotape is used to document field activities such as research projects, detours, construction operations, and signal timings.

Maintaining historical information: Videotapes are kept on file for up to 3 years.

Name of Contact Person:

Roger Dunn, Research Coordinator
Mike Keller, Television and Radio Coordinator
Department of Transportation
25 South Front Street
Columbus, Ohio 43215

Oklahoma Department of Transportation

The Oklahoma Department of Transportation is a heavy user of videotape. Full in-house production is available in both VHS and Betamax formats. The majority of videotape work is performed by the Training Division's video production branch. A full-time staff writes, directs, and produces numerous video projects. A training officer operates the camera in the field and studio; edits, directs, and produces videotapes; manages the office; attends script meetings; does audio work; and duplicates tapes. The full-time training specialist's primary job is editing, but he also operates the cameras and other equipment. Two training specialists are also assigned to the unit on a part-time basis as writers and to help out where needed.

Most videotapes used by Oklahoma are produced in-house. A videotape library is maintained with 126 tapes available for loan. The Traffic Division plans to begin videologging very soon. Videologging equipment will be used by two engineer technicians to log longitudinal distance, to conduct a sign inventory, and to record roadside development. The Department plans to videolog the entire road system.

Major Video Components

Convergence 204 editor
Intergroup 903 switcher
CEL P147-20 digital frame synchronizer with time base corrector
TBC and a P151-12 digital effects controller
Microtime T120-d time base corrector
Chyron VP-1 character generator with an Apple IIe
Sony 5850 recorder
Sony 5800 source deck
Convergence TCR-100 time code reader
Convergence ECs-261 time code generator
Hitachi FP-21 camera with CCU
Panasonic AG-2000 recorders
Sony 6800 portable recorder
Various monitors (color and b/w), a synchronized generator, and test equipment

Major Audio Equipment

TASCAM 133 audio cassette recorder
TASCAM 22-2 reel-to-reel recorder
TEAC-A3440 reel-to-reel portable mixer
Patch bays

Videologging Equipment

JVC 210 three-tube color video camera
JVC HZ-E512 power zoom lens
JVC VF 215 camera view finder
Panasonic WJ 300B video distribution amplifier
Panasonic WV 7230B video camera pan and tilt
Panasonic WV 7330 remote control for camera pan and tilt
JVC AA-P 26V AC camera adapter
JVC BR 6200 1/2" VHS video recorder/players (2)
Audio Technica AT 805S microphone
Rapid Tech 77C video mixer
Panasonic CT 7711A video color monitor (2)
Power inverter
Transwave NK 1203 distance measuring instrument
S.L. Waber surge protector and multiplug
Panasonic NV-8950 1/2" VHS video recorder/player
Keyport 300 digitizing tablet
Technar Graphics Master
IBM XT (DOS 2.0) compatible computer
AST Research multifunction expansion board
Sony PVM 1910 19" video color monitor

Approximate investment in audio and video equipment to date: $146,276.

Future Plans: Major components to be purchased include: matched cameras (leaning toward the Hitachi Z-31); upgrades for the editor, switcher, and CEL; another time-base corrector (either CEL or a Fortel Y688); a new character generator (probably a Chyron VP-2); a new production monitor; an additional Sony 5800 so ABC roll editing can be performed.

Most Frequent Uses for Videotape

Training: Equipment is used to explain new operations and procedures.

Documenting research: A videotaped report is sometimes submitted with reports to the FHWA.

Recording construction: Large projects employing new techniques are sometimes videotaped.

Troubleshooting: Drive-throughs of construction areas on highways are recorded in case of legal action as a result of an accident.

Recording meetings: Tapes of meetings are sent to staff to view at their convenience.

Disseminating information to field offices and employee communications: The department uses videotape in training, bond drives, and to disseminate information from administration. They are preparing to

produce a DOT video news show. They also have EEO, drug and alcohol abuse, and other counseling tapes.

Videologging: Videos are used to collect data on longitudinal distance, to provide sign inventory, and to record roadside development.

Testing new equipment: Videos are used by the research unit in the development of new procedures.

Name of Contact Person:

Cynthia White, Training Officer II
Department of Transportation
200 N.E. 21st
Oklahoma City, Oklahoma 73105
(405) 521-4521

Oregon Department of Transportation

The Oregon Department of Transportation is a frequent user of videotape and video equipment. Tapes produced in-house and prerecorded are used, and a videotape library of 300 tapes is maintained. The videotape recording needs are handled by a staff of four in the Photography Section. Time commitments to video work vary with production needs.

Oregon's road system has been videologged over the past two years. The data collected include a sign inventory, a record of roadside development, and general information pertaining to legal questions.

Major Video Components

Quantity	Description
1	Ikegami camera
1	JVC monitor
2	RCA television/monitor
1	Panasonic switcher
2	Panasonic monitor
1	Sony monitor
1	JVC 1/2" portable deck
2	JVC 3/4" portable deck
1	JVC 3/4" edit system
1	JVC 1/2" edit system
	Various tripods, lighting equipment, and sound equipment

Approximate investment in videotape equipment to date: $50,000.

Future Plans: To purchase a time base corrector, a character generator, additional lighting equipment, a sound support, and duplicators.

Most Frequent Uses for Videotape

The department reports that videotape is used in the following applications: training, documenting research, recording construction, troubleshooting, observing traffic, televising programs/advertisements, recording meetings, disseminating information to field offices, communicating with personnel, videologging, testing new equipment, documenting field activities, and maintaining historical information.

Name of Contact Person:

Ann Snyder, Public Affairs Specialist
Department of Transportation
140 Transportation Building
Salem, Oregon 97310
(503) 378-6546

Pennsylvania Department of Transportation

The Pennsylvania Department of Transportation uses tapes produced in-house and prerecorded. It maintains an extensive videotape library of 3/4" tapes, which covers a broad range of topics. A majority of the tapes are concerned with training. Tapes produced by the department are loaned upon request.

All videotape production needs, including post-production work, are handled by Media Services of the Department of General Services. Media Services was part of the Department of Transportation until demands for videotape services by other state agencies warranted the establishment of a separate division.

Both the Traffic Counting and Roadway Management Sections are considering the use of videologging, which will be used in a sign inventory, to provide surface texture and pavement ratings, and in counting traffic.

Name of Contact Person:

Barbara T. Harder, Director
Office of Research and Special Studies
Department of Transportation
Commonwealth and Forester Streets
Harrisburg, PA 17120
(717) 787-5593

Rhode Island Department of Transportation

Videotape is frequently used by the Rhode Island Department of Transportation's Training Office. Since there are no in-house facilities

available, prerecorded videotapes are primarily used. A videotape library is maintained, and there are no further plans to expand the use of videotape by the Department.

Major Video Components

Panasonic WV-CC25 color camera
Panasonic NV-8420 recorder
Panasonic NVB-58AD tuner/timer

Most Frequent Uses of Video

Training: Training tapes are used to assist in the orientation of new employees as well as for on-the-job training.

Recording Construction: Construction projects are taped to provide historical information and for use by the monitoring and evaluation section.

Documenting field activities: Field activities are videotaped to provide documentation for contract disputes and as a monitoring tool.

Name of Contact Person:

Carol M. Constanzo, Training Officer
Department of Transportation
210 State Office Building
Providence, Rhode Island 02903
(401) 277-2572

South Carolina Department of Highways and Public Transportation

The South Carolina Department of Highways and Public Transportation maintains in-house production facilities to take care of its occasional videotape needs. Videotapes are produced for various departmental units in conjunction with specific needs. All video production is the responsibility of one staff person who obtains occasional assistance from others. While the amount of time the department spends on videotape production varies, one of the most ambitious undertakings has been the production of a thirty- minute program emphasizing highway needs in South Carolina. This program has 16 different versions tailored to specific highway commission districts.

Major Video Components

Sony DXC-1610 color camera
Sony VO-3800 portable recorder
Sony VO-2610 player/recorder
Sony VO-2860 editing recorder
Sony VP-2260 editing player

Sony CVM-1250 monitor/receivers
Sony ECM-50 PSV Lavalier microphones
Sony TT-100 tuner/timer
Sony RM-430 editing control
Lowell light system
Gitzo 305 Cine 3 Pan tilt head
#1778 Video Storyboard pads
3600A/3610A Laird Telemedia character generator
Panasonic TT-100 tuner/timer
JVC 5" portable monitor
TEAC 3400 4-channel recorder
AKG 900E shotgun microphone

Additional equipment will be purchased as funds are available to replace outdated equipment.

Approximate investment in video equipment to date: $30,000.

Most Frequent Uses for Videotape

Training: Videotape is being used more extensively in this area since a training officer has recently been appointed.

Televising programs/advertisements: Twenty 30- and 60-second public service announcements (as well as longer news clips) have been produced.

Recording Meetings: A wide variety of meetings.

Communicating with personnel: Use of videotape for this purpose is on the increase.

Name of Contact Person:

James L. Walker, Jr., Director
Public Relations
Department of Highways and Public Transportation
Silas N. Pearman Building
Box 191
Columbia, South Carolina 29202
(803) 758-2101

South Dakota Department of Transportation

The South Dakota Department of Transportation has videotape production capability, and most minor post-production work is done in-house by the Training Division. The two most frequent uses of videotape are for training and to document research activities. Most training tapes deal with work techniques.

Major Video Components

Panasonic AV8500 1/2" recorder with NVA500 controllers
Sony 1820 camera
Sony 6800 portable deck
Several Panasonic 8410 and 8420 1/2" decks
Several Panasonic 3150 and 3160 cameras

Approximate investment in video equipment to date: $50,000.

Future Plans: To purchase 3/4" editing equipment.

Name of Contact Person:

Bruce Huxford, Training Specialist
Department of Transportation
Pierre, South Dakota 57501
(605) 773-3461

Tennessee Department of Transportation

The Tennessee Department of Transportation occasionally employs prerecorded videotapes for training purposes. A library of twenty tapes for supervisory and quality circles training is maintained. The Department is planning to expand its videotape uses to videologging. Videologging will be accomplished using a specially equipped vehicle purchased from Highway Products International. One thousand and fifty-seven miles of interstate and 12,223 miles of state highways will be recorded. Longitudinal distances, surface textures, and pavement ratings will be logged. All data currently gathered with the existing photolog procedure may eventually be converted to the videolog. While the Department currently maintains no video staff per se, specific personnel are being trained to use the videologging equipment.

Major Video Components

JVC KY 210 camera
Sony monitor
Panasonic AG-6300 recorder
JVC BR-6200U recorder
JVC monitor
Panasonic WJ-4600C effects generator

Name of Contact Person:

Willard R. Newton, Transportation Manager
Department of Transportation
Suite 700, James K. Polk Building
505 Deadrick Street
Nashville, TN 32719
(615) 741-2151

Texas State Department of Highways and Public Transportation

In the Texas State Department of Highways and Public Transportation, the most common uses for videotape are training, the production of television programs/advertisements, recording meetings, and maintaining historical information. The Department's use of videotape varies among highway districts throughout the state.

Videotape equipment is decentralized to the extent that all 24 districts and the central office have equipment at their disposal. Videotape equipment located in the districts is of both the 3/4" and 1/2" variety; the central office has in-house 3/4" production equipment. Most training and special project tapes are produced by the central office, and a video library contains mostly training tapes and special reports.

Name of Contact Person:

Herman Kelly, Director
Texas State Department of Highways and Public Transportation Magazine
DeWitt C. Greer State Highway Building
11th and Brazos
Austin, TX 78701
(512) 463-8603

Utah Department of Transportation

The videotape needs in the Utah Department of Transportation are the responsibility of the staff in the Training, Testing, and Development Unit. This unit consists of one supervisor, one training technician, and one part-time maintenance operations coordinator. A complete videotape playback system is available in both the central office in Salt Lake City and in six district offices. Most videotape production is contracted out, and the majority of tapes produced are for training, especially in the area of maintenance.

Virginia Department of Transportation

The Virginia Department of Transportation makes occasional use of videotape in its operations. Currently, tapes produced in-house and prerecorded are used, and a video library is not maintained.

The Virginia Transportation Research Council in Charlottesville produces videotapes used by the central office located in Richmond. The Research Council has part-time staff to respond to videotape production needs. It is comprised of a video administrator who oversees the operations and schedules shootings, a camera operator/editor, and two technicians who assist the camera operator as needed. Members of this staff have other responsibilities besides their part-time commitment to video work.

Major Video Components

Quantity	Description
1	Sharp XC-A1 camera
1	Sony VO-6800 3/4" portable VCR
1	Panasonic NV-8420 1/2" portable VCR
1	Panasonic NV-8950 1/2" VCR
1	Panasonic NV-9300A 3/4" VCR
1	NEC 25" color monitors
1	Quasar 25" receiver monitor
1	Panasonic CT-500V 10" monitor
1	Panasonic WV-3400 camera
	Various battery packs, tripods, etc.

Approximate investment in video equipment to date: $20,000.

Future Plans: To purchase editing equipment for the central office and outfit the entire Department with recording equipment.

Most Frequent Uses for Videotape

Training: Videotapes are used in courses where taping of interaction is called for. The department uses "canned" videotapes for career development.

Documenting research: The Research Council tapes research experiments.

Recording construction: Construction of I-664 bridge tunnel is being videotaped.

Observing traffic: Some traffic counts, intersection and conflict analyses are made using videotape.

Documenting field activities: The staff takes cameras into the field to record problems.

Name of Contact Person:

Mike Perfater, Research Scientist
Virginia Transportation Research Council
Box 3817 University Station
Charlottesville, Virginia 22903-0817
(804) 293-1939

Washington State Department of Transportation

The Washington State Department of Transportation uses videotape in its operations. Tapes produced in-house and prerecorded are used. A videotape library containing 20 training tapes and 64 technology transfer tapes is maintained. The staff responsible for video production is comprised of two transportation planning technicians who work part-time as camera operators, one planning specialist who works 120 hours per month supervising the videolog system, and one transportation planning technician who duplicates tapes and maintains the video library.

Videologging, which assists the department in determining the condition of both the roadway and the roadside, has been performed for four years. To date, 654 miles of interstate and 6,234 miles of state highways has been logged.

Major Video Components

Quantity	Description
3	Vans
5	JVC 19" monitor
3	JVC VHS recorder/player
1	JVC KY-3100 camera
1	JVC HZ E 5721 zoom lens
1	Apple II computer
1	Video Associates VB-3 video board
1	Sony VO 2611 3/4" video recorder
1	Dynamote B10 1000 watt power inverter
1	JVC RS-5000 remote camera control unit
2	JVC TM-22U 5" video monitor
1	Sony VP-5000 3/5" Umatic video player
1	JVC BR-6400 1/2" video player/recorder
1	JVC RM-P53U remote control
1	Sony 19" monitor with trintron tube
1	Sony RX 353 programmable random access control
	Show-Time Video Ventures image enhancer model VV-27COP

Most Frequent Uses for Videotape

Training: The Training Office uses prepared videotapes for employee training in the NWT2 Center.

Documenting research: Research projects of special interest have been videotaped. The most recent dealt with the topic of "Highway Runoff Water Quality."

Videologging: All state routes are videotaped on a two-year cycle (half of the system each year). Copies are sent to headquarters and district offices.

Disseminating information: Various uses.

Name of Contact Person:

George D. Crommes, Manager, NWT2 Center
Washington State Department of Transportation
Building KF-01
Olympia, WA 98504
(206) 753-3811

West Virginia Department of Highways

The West Virginia Department of Highways reports limited use of videotape in its operations. The Equipment and Training Divisions are the primary users of videotape equipment in the Department, often employing prerecorded tapes produced by the Federal Highway Administration, the Treasury Department, and specialized research organizations. A few in-house training tapes using JVC and SHARP recorders and cameras have also been produced by the Department.

Name of Contact Person:

J. Craig Rothwell, Deputy Commissioner
West Virginia Department of Highways
1900 Washington Street, East
Charleston, West Virginia 25305

Wisconsin Department of Transportation

The Wisconsin Department of Transportation frequently uses videotapes produced in-house and prerecorded in its operations. In-house production of 3/4" tape is available; special effects is contracted out. A videotape library is maintained which contains approximately 200 tapes.

Videotape needs are handled by a full time engineer technician IV group leader and a photographic technician III. They work both in the field and in the office and are involved in both recording and post-production work.

Upgrading the editing system and videologging are currently under consideration by the Department.

Name of Contact Person:

Phil Stanley, Media Prod. Coordinator
Department of Transportation
4802 Sheboygan Avenue
Madison, Wisconsin 53702
(608) 267-2306

District of Columbia Department of Public Works

The District of Columbia Department of Public Works has recently invested $14,000 in RCA cameras and VCRs. Owing to the lack of production expertise and equipment, only prerecorded tapes are used at this time. The Department plans to use videotape in the following ways: training tapes for dealing with the media; spot-filming of major construction projects; and traffic surveillance to aid in pedestrian and vehicle movement studies. Future plans also call for in-house recording of major projects and emergency situations.

Name of Contact Person:

Tara Hamilton, Public Information Officer
Department of Public Works
2000 14th Street, N.W., 6th Floor
Washington, D.C. 20009
(202) 939-8099

VIDEOLOGGING AND VIDEO LASER DISC APPLICATIONS

Videologging

Videologging, like photologging, is a method of making videotape recordings of the highway corridor. Owing to recent advancements in videotape picture quality and editing techniques, the states of Connecticut, Delaware, Florida, Georgia, Idaho, Missouri, New York, Oregon, and Washington are now using videologging to aid in their day-to-day operations. Alabama, California, Michigan, Mississippi, New Jersey, Oklahoma, Pennsylvania, Tennessee, and Wisconsin report that plans are being finalized for implementing videologging in those states. Videologging offers most of the same advantages as photologging in that it helps to minimize field trips, is an easy method to collect data, and the data are easy to store. However, it also offers many advantages which filmed photologging cannot offer. Videologging provides the opportunity by which voice recordings can be added either in the field or at a later time. Since no processing is required, videotape allows for real-time monitoring as a result of immediate playback. Moreover, videotapes can be reused a number of times and interfaced with a microcomputer to allow computerized inventories.

Any data gathered by photologging may also be collected using videologging. The most frequent use of videologging by state transportation agencies is the maintenance of sign inventories. Other uses mentioned by survey respondents include: determining longitudinal distance, assessing roadside development, rating surface conditions, pavement rating, determining horizontal and vertical curvatures, determining azimuth, grade, cross slope, roughness, and side friction, and assessing right-of-way boundaries. Other possible videologging applications might also include documentation of sight restricted areas, determining the location of speed and passing zones, ascertaining location and type of roadway lighting, locating and typing curbs, sidewalks, and parking zones, planning landscaping and determining compliance with state roadside regulations.

Videologging does have a few disadvantages when compared to photologging. First, photologging can be performed by one person, whereas a videologging operation usually requires two people. This extra budget demand is a major consideration in an era of diminishing highway funds. Second, high-quality videologging equipment may be more expensive initially than photologging equipment. As the cost of film processing continues to increase and the cost of video equipment decreases, this gap between videologging and photologging start-up costs is rapidly closing. Another disadvantage of videologging is that large groups cannot easily view videolog data since several monitors are necessary. Also, for certain applications, the image quality of videotape may not be sharp enough, although this problem is diminishing as videotape technology improves. The New York DOT, for example, opted to retain their existing photologging system rather than switch to videologging because the picture quality of the former is superior. Finally, it should be pointed out that photographs cannot be made directly from videotape while they can with the photolog film. Because the California Department of Transportation is involved in frequent litigation requiring photographs as evidence, it hasn't switched to videologging.

Laser Disc Technology

A video laser disc resembles a 12-inch phonograph record and has the capacity to store four gigabytes of data on one or two sides. Images are digitized and recorded onto the reflective surface of the disc by a high-energy laser beam. The disc is then read by a low energy beam. Data recorded on these discs can include graphics, alphanumerics, sound, moving pictures, and still pictures. The video disc is nearly damage proof as its clear coating is impenetrable by anything other than the laser beam which reads it.

Video laser disc technology was introduced to the consumer market at the same time videotape recording equipment was introduced. Due to competition from videotape equipment, the disc did not become popular. These early discs, called Level I discs, had no built in programming. The user could only insert a disc into a player and view it. Recent improvements in the interfacing capability of video laser discs have advanced the

technology considerably. Level II discs provide for instant access to any track on the video disc as well as slow motion, fast forward review, and reverse. The newer Level III system offers the same features as Level II, except that the disc is controlled by an external computer (often a personal computer) which allows the disc to become as flexible as a computer program. This flexibility and control by the operator has made the video laser disc an excellent interactive medium for education.

Both Levels II and III are suitable for use in training. For example, Level III is currently being used by General Motors Corp. and Gould, Inc., for employee training. This training takes may forms and basically allows the student to move at his own pace. A Level III system costs between $8,000 and $10,000. As video laser disc usage continues to grow, many manufacturers of disc equipment are beginning to specialize in the various courseware products which are needed for training applications. As use increases, the cost of video laser disc systems will likely decrease and capabilities will likely increase.

The laser video disc system that the Connecticut Department of Transportation uses is based on existing photolog 35mm film. The 35mm film is converted to videotape, which is edited to create a master tape; this master tape is then used to produce a video laser disc. One side of a disc can store 54,000 frames of 35mm film. This translates to 260 photolog miles of normal road images and 260 photolog miles of corresponding pavement close-ups. These discs are less expensive to store and cheaper to reproduce than film or videotape and have been found easier to access than either of the other two mediums.

The Wisconsin Department of Transportation is developing a video laser disc system similar to that of the Connecticut Department of Transportation. One major difference is that the Wisconsin DOT is using the DRAW format (which involves the use of a smaller disc than that used in Connecticut) in which 240 photolog miles are recorded per disc with random access from frame 0 to 24,000 in one second. A pilot project in which one highway district was completely photologged in 1985 is currently under way. Approximately 2,228 photologged miles have been transferred to ten optical discs. The Department is currently awaiting the delivery of a disc player with a modified controller and high resolution monitor which is needed to conduct a total evaluation of this system.

Videologging in Transportation - Some Specific Examples

Each state transportation agency using videologging has developed its own methods for the use of this technology. These methods range from the system substituting videotape for film in Idaho and Florida to the use of the video laser disc system in Wisconsin. Ten state transportation departments use videologging to some degree; all report favorable experiences.

The following section of this report provides some in-depth information as to the various activities four state transportation departments

(Connecticut, Alabama, Oklahoma, and Washington) have under way in the videologging area. Exhibits A - D provide videologging system specifications drawn up by those states.

EXHIBIT A

CONNECTICUT DEPARTMENT OF TRANSPORTATION

Videologging System Specifications

EQUIPMENT SPECIFICATIONS

HIGHWAY PHOTOLOG/DATA SYSTEM

The following specifications describe a van-type vehicle equipped with a photolog/data system to be purchased by the Connecticut Department of Transportation (ConnDOT). The complete system shall consist of a vehicle, camera, data-display unit, power supplier, instrumentation unit, sensors and control console. All data-acquisition, processing, monitoring, and display-input and -output functions shall be controlled by a microcomputer. The vehicle will be used for photologging and the recording of pertinent data on the state-maintained highway system.

VEHICLE

The vehicle shall be a new model E-250 Ford Econoline Van, or equivalent, powered by a V-8 engine of at least 350-cu. in. displacment and equipped with the vehicle manufacturer's recommended automatic transmission. The following features shall be included with the chassis and engine:

Four-barrel carburator
Factory-installed air conditioning
Factory-installed power steering
Dual batteries (one possessing
an 81 ampere-hours rating and
the other a 68-ampere-hours rating)
Alternator with 135-ampere capacity
16-inch wheel rims and radial tires
(LT 215/85 x 16")
Spare wheel and rim on rack mount
at rear of van w/tire-changing tools
Heavy-duty suspension and shocks
Heavy-duty radiator
Cruise Control
Dual fuel tanks (min. total capacity 40 gal)
Complete undercoating and rust proofing

Equipment Specifications
Highway Photolog/Data System

The van body shall be painted with a white gloss enamel and possess the following features:

A non-tinted windshield; all other windows heavily tinted
Swivel captain's chairs for driver and passenger
Sliding side door and hinged rear doors
Anti-static floor mats for driver and passenger
Dual exterior low-mount western swingaway mirrors
AM Radio
Roof-mounted strobe light
Interior mirror
Dual sun visors

PHOTOLOG/DATA SYSTEM

The above-described vehicle shall contain the photolog/data acquisition system. The system shall be properly installed and in working condition when delivered. The system shall meet the following specifications:

GENERAL

The complete system shall consist of a camera, recorder, display unit, instrumentation unit and an operator's control console. The system shall be thoroughly tested at the factory and an exposed test film and corresponding printout shall be provided on delivery to demonstrate the performance of the camera, instrumentation, data display and recorder.

The contractor shall provide instruction for two ConnDOT personnel for two days each on the contractor's premises at no charge to ConnDOT. All travel expenses and subsistenance costs incurred by ConnDOT personnel on departure from Rocky Hill, Connecticut, until such time as they depart the

contractor's premises, including the two days' instruction period, shall be borne by the contractor. Expenses incurred in transporting the vehicle from the contractor's premises back to Rocky Hill, Connecticut will be the responsibility of ConnDOT.

CAMERA

The camera shall be a 35mm Automax GS-1R with electric drive and electronic triggering. A secondary field lens shall be provided with the camera to produce an image of the instrumentation readout. The camera shall possess the following characteristics and features:

1. solid-state circuitry for motor control and synchronization;
2. 24-volt DC power supply (from vehicle battery using a 12 to 24 volt converter;
3. synchronization pulse provided by an internal LED and photocell;
4. switch to defeat end-of-film bulb and audible alarm;
5. switch to provide an output pulse for each frame;
6. maximum pulse rate of 10 frames per second;
7. a cine rate of 10 frames per second;
8. a variable shutter possessing a range of shutter speeds from 1/125 to 1/2000 sec.;
9. four 400-ft Mitchell film magazines;
10. a Nikkor 24mm focal length f2.0 lens with the click stop removed;
11. a 30mm focal length, f3.5 secondary-field lens to produce instrumentation readouts on top of the projected image;
12. built-in mirror for use with bore sight;

13. black wrinkle over anodized finish;

14. three operation/maintenance manuals and a tool kit shall be provided with the camera;

15. a two-axis mount capable of at least an 11° sweep in each direction from the zero setting (in this case the zero setting shall correspond to the camera aimed straight ahead with the longitudinal and transverse axes of the vehicle parallel to level ground) in both azimuth and elevation. The mount shall be divided into degres to indicate the position of the lens axis with respect to the zero setting. The scales shall encompass at least 22 degrees of arc (11° each side of the zero setting);

16. one 100-ft film magazine;

17. an Apex B35 automatic exposure module. This module shall be capable of calibrating shutter speeds over a range of from 1/50 to 1/12,000 second and shall have a two-second response time to cover the entire aperture range. The sensor angle shall be at least 35°; and,

18. An audible insufficient-light switch.

INSTRUMENTATION UNIT

The instrumentation unit shall consist of sensing components and power-conversion units, and a processing section. All components of this unit shall be instrumented through heavy-duty shielded flexible ribbon cables. The instrumentation unit shall be constructed of standard 19-inch rack-mount cabinets. Each module with the instrumentation cabinet shall be provided with sliding rails to permit easy removal for servicing.

1. Sensing Components and Power-Conversion Units

A. Odometer. The odometer shall consist of a magnetic transducer mounted at the left front wheel, and shall be independent of the

vehicle's speedometer. This transducer shall include a magnetically operated, mercury-wetted diaphragm switch mounted to the brake caliper of the left front wheel and magnets mounted on the wheel hub. It shall be interfaced directly to an interrupt line of the microcomputer in the processing section. Distance traversed is determined by counting and storing transducer output pulses, and applying a correction factor for tire wear and volume changes due to pressure effects. Odometer output is transmitted simultaneously to the camera display unit and display section of the console. Proper calibration of the odometer shall permit an accuracy of +/- 0.1%. This accuracy shall hold for operating speeds of from creep to 60 MPH.

B. Clock. A crystal-controlled 24-hour clock circuit shall be located on the microcomputer circuit board and shall inferface directly to the system microcomputer. This circuit shall have an independent power supply. Time and date information shall be transmitted from this clock to the recorder via the microcomputer. The capability shall exist to set the time and date through the keyboard of the console unit and to monitor each field in the console display separately. Nominal accuracy shall be +/- 1 min/month under operating temperatures of from 0 to 40°C.

C. Roughness Sensor. Pavement-roughness shall be measured using a transducer mounted as closely as possible to the center of the vehicle's rear axle. The transducer shall be an accelerometer

placed so as to sense vertical displacement of the rear axle. The accelerometer output shall be converted to a signal proportional to displacements of the rear axle and shall be transmitted to the microcomputer via an analog multiplexer and A/D converter. The microcomputer shall detect rear-axle deflections within a range of +/- 24mm, which is divided into 16 3mm increments. The roughness shall be the accumulated count normalized over a preset distance.

D. Pendulum or Side Friction Sensor. A damped pendulum with a potentiometric output shall be mounted on the vehicle's rear axle. The output from the pendulum shall be transmitted to the microcomputer through the analog multiplexer and A/D converter. A plug-in circuit board for the sensor shall be provided in the instrument unit, together with a zero control.

E. Vertical Gyroscope. A Collins Model 332E11 vertical gyroscope shall be used as a reference platform for grade and cross slope measurements. The gyro output shall be transmitted directly to the microcomputer via a synchro-to-digital converter. The capability shall exist to correct for variations in vehicle altitude due to load through the keyboard on the Control Console. Gyro accuracy shall nominally be +/- 1%. The gyro shall be powered by a 12-V to 110-V, 400-Hz supply installed near the gyro. The gyro and its power supply shall be connected to the microcomputer via flexible cables.

F. Gyro Compass. A Sperry Model SR220 shall serve as the reference for azimuth determinations. Compass readout shall be in true degrees. Accuracy shall be within +/- 1 degree. This accuracy shall hold in vehicle turns of up to 25 degrees per second. The gyro shall be powered by a converter that changes the vehicle's 12-V DC supply to 24-V DC and an inverter that converts 24-V DC to 110-V, 400-Hz AC. The gyro compass output shall be transmitted to the microcomputer.

2. Processing Unit

All data-acquisition, processing, monitoring, display, and recording functions shall be controlled by a microcomputer. The microcomputer shall be located in the instrumentation cabinet. The microcomputer shall receive output from all sensors, process the signals, and transmit appropriate data to the recorder, control console, and camera data display via heavy-duty, shielded ribbon cables.

CONTROL CONSOLE

Operation of the entire system shall be controlled through a console positioned so as to be readily accessible to the photolog operator. The console shall consist of a keyboard and an alpha-numeric display panel, as well as circuits to interface these components with the microcomputer.

Equipment Specifications
Highway Photolog/Data System

1. Keyboard

The keyboard shall be of the membrane type and shall be divided into three groups of keys, each group having its own specific function, namely: data entry, instrument and variable, and systems operation. When any of the keys are depressed an audible beeper shall be activated.

A. Data-entry Keys. This group shall contain 40 keys: one for each upper-case letter of the alphabet, one for each numeral, one for the symbols "+", "-", and ".", and an entry key. These keys shall be used for entering data such as route number, mileage correction factors, etc. into the system.

B. Instrument and Variable Keys. This section shall consist of 19 instrument keys and 8 variable keys. The instrument keys shall address the various instruments and the recorder, which are controlled by the microprocessor. These fields are as follows: date, route, control, odometer, time, film number, event No. 1, event No. 2, recorder, compass, horizontal curvature, speed, grade, vertical curvature, cross-slope, side friction, and long- and short-term roughness.

The variable keys shall address the appropriate sections of the microprocessor to permit access to the system for servicing and selection of the following system operating parameters: odometer correction factor, frame-interval distance, frame number, and intervals for horizontal and vertical curvature and long- and short-term roughness.

C. Operation Keys. The 16 keys in this group shall be used to select a test function (preset odometer, reset odometer and roughness counters, clear odometer to zero, roughness update, calibrate, test system, test display, and halt test), control camera operations (pulse, cine, load, and stop), and control odometer operations (enable, hold, up count, and down count).

2. Alpha-numeric Display Panel

The display panel on the control console shall have one 40 character line of dot matrix, alpha-numeric LED readouts divided into five groups. These groups shall be labelled and function as follows:

LABEL	CHARACTER NO.	FUNCTION
ODOMETER	1, 2	Space
	3	Indicates odometer or system status as E - Odometer Enabled H - Odometer Hold T - System under Test D - Display under Test
	4 - 11	Show the current odometer distance together with a + or - sign to indicate direction of odometer count
INSTR	12, 13	Space
	14 - 17	Designate the instrument or variable selected by the operator on the keyboard
DATA	18	Space
	19 26	Show the alpha-numeric data of the selected instrument, or data entered by the operator on the keyboard

LABEL	CHARACTER NO.	FUNCTION
ALARM	27, 28	Space
	29 - 32	Indicates the instrument or variable that is detected by the microcomputer to be in error or malfunctioning
FRAME	33, 34	Space
	35 - 38	Displays current camera frame number
	39	Space
	40	Indicates the status of camera display console. "D" indicates the display is on

An audible alarm shall also be actuated when any one of the instruments or readouts is detected to be malfunctioning.

DATA DISPLAY UNIT

The data display unit shall consist of a camera adaptor and display head. The adaptor shall be attached below the camera and the display head secured to the adaptor via latches to permit access to the data panel. The display head shall contain circuitry to store data transferred from the microprocessor and control console, decode the data and display them on an LED data panel in the display head.

The data panel shall consist of a single row of self-illuminating dot matrix light-emitting diode (LED) readouts. The LEDs shall be pulsed to a high intensity by a synchronization signal from the camera. The display unit shall be connected to the instrumentation unit and control console via shielded flexible ribbon cables.

The data items that shall appear on the one-row array and their arrangement with respect to one another are shown in Figure 1.

The color of the light emitted by the diodes and its intensity shall be suitable not only for reading on positive film, but also for transfer to a video laser disc.

MAGNETIC-TAPE DATA RECORDER

A magnetic-tape data recorder utilizing cassettes shall be incorporated as part of the system to store all pertinent digital information generated by the system sensors and microcomputer. The system shall consist of a Tandberg Data Inc. TDC 3000 Digital Cartridge Recorder/Playback unit with a four-track capability. The recorder shall use 3M Company's DC-300A Data Cartridge. Provision shall be made to rack-mount the recorder in the instrumentation unit. The recorder shall contain a Tandberg TDC-3205 Communications Interface with a 2,048 ASCII character buffer, data formatter and 110V power supply. The data-system microcomputer shall utilize an RS-232 interface to control the operation of the recorder and permit the transfer of data from the photolog system to the recorder. Three operations/maintenance manuals and complete schematics shall be provided for the recorder.

The recorder shall store on tape the following data items and information in the sequence posed:

Equipment Specifications
Highway Photolog/Data System

ITEM	CHARACTERS	POSITION FROM	POSITION TO
1. Route	8	2	9
2. Control	8	11	18
3. Odometer	8	20	27
4. Side Friction	4	29	32
5. Grade	5	34	38
6. Cross Slope	5	40	44
7. Date	6	46	51
8. Time	6	53	58
9. Compass	3	60	62
10. Roughness LT	3	65	67
11. Roughness ST	3	69	71
12. Curvature (Horiz.)	5	73	77
13. Curvature (Vert.)	4	79	82
14. Film No.	4	84	87
15. Event	8	89	96

T[illegible] Revision Date: 3/5/86
Prev[illegible] Revision Date: 11/85

ATTACHMENT A

ConnDOT PHOTOLOG LIBRARY VIDEODISC VIEWING SYSTEM SPECIFICATIONS

ITEM/DESCRIPTION	MANUFACTURER	MODEL
GRAPHOVER 9500 - commercial grade raster-scan display generator and videodisc controller; includes built-in Motorola 6809 processor with a bank of 32 64K RAM chips, NEC uPD-7220 graphics display controller with 768 x 682 x 4 pixel display buffer, pan, zoom, RGB analog and NTSC outputs gen/lock, video switcher, host CPU interface, and controller for two videodisc players. Includes User and Service Manuals.	New Media Graphics	G O 9500
GRAPHICS TABLET GT-100 - electromagnetic type with 11 x 11 inch active tablet area, 0.001 inch resolution, 15 ft custom cables to Graphover 9500, 5-button censor.	GTCO	GT-100
5160 SYSTEM UNIT - 256Kb RAM on motherboard; 8088 @ 4.77MHz; one 5.25-inch DS/DD diskette drive and adapter; 83-key keyboard; BASICA Interpreter w/Manual; Guide to Operations Manual.	IBM	PC-XT Model 68
SECOND DISKETTE DRIVE - 5.25 inch half-height drive with controller card and Manual.	Mitsubishi	M4851-125V
HARD DRIVE - 20 Meg half-height hard drive with controller card; half-height drive Stack kit; and Manual.	Seagate	ST-225
MATH CO-PROCESSOR	Intel	8087
MULTIFUNCTION BOARD - 384K RAM memory; 1 parallel port; 1 serial port (RS232-C); clock/calendar; multifunction board software; and Manual.	AST	6-Pack Plus
EXTENDED MEMORY BOARD - 2 Megabyte, low power consumption; low heat; CMOS RAM with software for extended memory RAM disks; print spooling and disk cache (meets Lotus/Intel standard); with Manual.	Micro Way	Mega Page
PC-GRAPHICS BOARD - 720 x 348 pixel monochrome graphics; 1 parallel port; with Manual and video port.	AST	Preview!
MONOCHROME MONITOR - 720 x 350 resolution 12-in. Amber Monitor	Quadram	Amberchrome
PRINTER - Near letter quality; 15-in. IBM char. set, shielded printer cable; with Manual.	Epson	FX-286

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This Revision Date: 3/5/86
Previous Revision Date: 11/85

ConnDOT PHOTOLOG LIBRARY VIDEODISC VIEWING SYSTEM SPECIFICATIONS

ITEM/DESCRIPTION	MANUFACTURER	MODEL
LASER VIDEODISC PLAYER with Remote Control Unit, external computer interface and repair manuals - front leading unit - 3 sec max search time - variable speed playback - x1 to 1/127 (FWD, REV) - RS-232C, serial interface selectable 9600, 4800, 2400, 1200 bps - supports both "Inquire" and "Show" frame and chapter number	Hitachi GEM Division	VIP-9550 w/remote controller; manuals
13" HIGH-RESOLUTION PROFESSIONAL COLOR MONITOR with service manual. - 0.31 mm dot pitch - precision-in-line CRT - RGB and NTSC inputs - aperture, brightness and contrast control in RGB mode - more than 600 scan lines at center - NTSC comb filter - 0.5 mm convergence in Zone 1 and 0.7 mm elsewhere	Sharp Electronics Corp. Professional Products Div.	XM-1300
DATASAVE 400/UNINTERRUPTABLE POWER SUPPLY - 400 Watt - UPS hold-up time - at full-rated power - 5 min. - at half-rated power - 15 min. - front panel master switch - 3 UPS outlets - 1 line outlet w/surge and transient protection - line input current, 5 amps (RMS) - line to UPS transfer time is 2-8 milliseconds - dimensions - 2" H x 13" W x 13" L	Cuesta Systems Corp.	40012060
ALL REQUIRED CABLES BETWEEN COMPONENTS	Various	Various
SOFTWARE (in addition to items included elsewhere		
a. Modifications to GO-9500 program HIWAY in accordance with specifications in Attachment B.	New Media Graphics	
b. IBM PC Driver in C	New Media Graphics	DR-100
SETUP, TESTING, INSTALLATION & INSTRUCTIONAL SESSIONS	New Media Graphics	

This Revision Date: 3/5/86
Previous Revision Date: 11/85

ConnDOT PHOTOLOG LIBRARY VIDEODISC VIEWING SYSTEM SPECIFICATIONS

WORK STATION

ITEM/DESCRIPTION	MANUFACTURER	MODEL NO.
1. Work Station/Terminal Table Steel Construction Colors: Oak top, putty base Dimensions: 72" W x 30" D x 27" H	Marvel Metal Products Company	60006
2. Suspension Drawer Unit for Electronic Environment Color: Putty Dimensions: 14 3/4" W x 19 1/2" D x 21" H	Marvel Metal Products Company	62002
3. Topper Color: Putty Dimensions: 21" W x 13" D x 4 3/4" H	Marvel Metal Products Company	69219
4. Caster Package	Marvel Metal Products Company	69600
5. Ergonomic Chairs/Ergonom 2 Color: Cocoa (Stock Fabric) Pneumatic-lift swivel arm chair w/casters (Arms: L3, Brown)	Grahl	0321M

EXHIBIT B

ALABAMA HIGHWAY DEPARTMENT

Videologging System Specifications

VIDEOLOG SYSTEM
SPECIFICATIONS

Item I is intended to be one integral unit and is to be bid as one unit complete, installed in a one-half (1/2) ton, heavy duty, long wheel base van which will be supplied by the State of Alabama Highway Department, and delivered to the specified address. This van will be available for installation of equipment in December 1985 or January 1986.

Item II is to be stated separately and the department reserves the right to accept or reject the vendor's bid on each of these individual items.

Due to the frequent advances in technology, the department also reserves the right to reject any individual bid on an item which may be outdated during the procurement process.

Item I consists of the following components:

I. (A) Commercial Grade Color Video Camera
   (B) Camera Platform
   (C) Computer
   (D) Commercial Grade 1/2" Video Recorder/Players VHS (three (3) required)
   (E) Distribution Amplifier
   (F) Commercial grade 7" color monitor (two (2) required)
   (G) Vertical/Horizontal curve instrumentation
   (H) Miscellaneous

Item II consists of the following components:

II. (A) Viewing Equipment
      (1) Remote control video cassette recorders 1/2" VHS (thirteen (13) required)
      (2) Color monitors - 19 inch, high resolution (thirteen (13) required)
   (B) Microcomputer - 100% compatible with IBM 3081 mainframe
   (C) System Communications
   (D) Miscellaneous
   (E) Storage Cabinets
      (1) VCR & monitor (thirteen (13) required)
      (2) 1/2" video tape (thirteen (13) required)

III. Vendor Information

VIDEOLOG SYSTEM
SPECIFICATIONS

I. FIELD EQUIPMENT :

A. Commercial Grade Color Video Camera

1. Camera - JVC 210
2. Lens - Fujinon 12X9
3. Optical Filter - Close, 3200K, 5600K & 1/4ND, 5600K
4. Microphone - Technica AT805S Omni Directional

B. Camera Platform

1. Panasonic Vicon - Electric Pan and Tilt
2. Tilting Speed - Approximately 4 degrees per second
3. Tilting Angle - 45 degrees up - 45 degrees down from level
4. Panning Speed - Minimum 5 degrees per second
5. Panning Angle - 10 to 340 degrees adjustable
6. Remote control unit to include lens & zoom focus

C. Computer - IBM Portable 5155 System Unit Model 76

1. Automatic Date and Clock
2. Nine inch composite video display (Amber)
3. Quick Data Entry Pad to include 300 separate inventory items

4. Peripheral for Data Acquisition - Ability to interface with Rockwell/Collins Attitude Heading System 85 and Transwave Distance Measuring Instrument Model - NK 1203

5. Eight interrupt levels

6. Direct Memory Access (DMA) - three channels

7. 40K bytes of Read Only Memory (ROM)

8. BASIC 80-Interpreter in Read Only Memory (ROM)

9. Seven system expansion slots for feature cards

10. Color/graphics monitor adapter

11. A programmable speaker and associated adapter

12. One 5 1/4 inch diskette drive adapter.

13. Two 5 1/4 inch Double Sided, 360K byte Diskette Drives

14. Keyboard Adapter and 83- Key lightweight keyboard with adjustable 5 or 12 degree typing angle.

15. Automatic power on self-test

16. Protective lightweight carrying case with handle

17. Parallel Printer Ports

18. Serial Data Transfer Port

19. Physical Characteristics:

    (a) Height - 8 inches (204 mm)

(b) Width - 19.5 inches (500 mm)

(c) Depth - 17 inches (430 mm)

(d) Weight - Approximately 32.4 lbs (14.7 Kg)

(e) Air Temperature - 60 to 90 degree F (15.6 to 32.2 C) for System On, 50 to 110 degrees F (10 to 43 C) for System Off.

(f) Cooling: Air cooled via internal fan

(g) Noise Level: 49.5 decibles without printer

(h) Electrical: 115 volts AC, 60 Hertz

(i) Humidity: 8% to 80% for System on/off

20. Software Package-menu driven with the following:

(a) Ability to enter data thru data entry pad

(b) Ability to gather roadway inventory data to allow seven digit coding

(c) Ability to reflect history data

(d) Ability to capture data on 5 1/4" floppy disk

(e) Ability to merge computer generated data and video camera output, and define position of video overlay.

(f) Ability to supply cross reference to video file

D. Commercial Grade 1/2" Video Recorder/Player VHS

1. JVC Portable Recorder BR6200U (3-required)

E. Distribution Amplifier

1. Panasonic WJ300B (1-required)

F. Commercial Grade 7" Color Monitor

1. Panasonic CT 7711A (2-required)

G. Vertical/Horizontal Curve Instrumentation

1. Rockwell/Collins - Attitude Heading System AHS-85
The verticle/horizontal curve instrumentation is to be a strap-down reference system that will generate angular rate and linear acceleration about the axis of the vehicle, and digitally process this data to obtain 3-axis angle, rate, and acceleration information. This system will allow software control of system integrity. The monitoring architecture is to provide a high-coverage check of output validity. This system is to consist of the following components:

(a) Attitude Heading (Computer (AHC-85)

(b) Internal Compensation Unit (ICU-85)

(c) Flux Detector Unit with mount mating connector Kit (FDU-70)

(d) Instrument Power System (400Hz; 28VAC)

H. Miscellaneous

1. Interchangeable, stable, camera mount

2. Operator Console - To be compatible with onboard equipment

3. Operator and service manuals with schematic diagrams of individual devices

4. Equipment Racks & Storage - To be compatible with onboard equipment

5. Cables

6. Power Meters - DC/AC Instrumentation (12V/120V)

7. Power Inverter (DC/AC) 115 Volt AC Output at 500 watts and battery storage

8. Distance Measuring Instrument - Transwave Model NK 1203

9. Dehumidifier

   (a) Power required: 115 Volt AC, 3-5 amps

   (b) 27 pint reservoir

   (c) Dimensions: 12" x 20" x 18"

   (d) Approximate weight: 60 lbs

10. System Design, Development, Purchasing

11. Training

   (a) A minimum training period of not less than five working days eight hours per day will be required to train three operators to use the Videolog System.

II. Office Equipment

A. Viewing Equipment

(1) Thirteen (13) - Panasonic NV-8950 1/2" VHS Dynamic Tracking Video Cassette Recorders with the following characteristics:

   (a) Power Source: 120 VAC, 60 Hz.

   (b) Power Consumption: Approximately 77 watts

(c) Television System: EIA Standards (525 lines, 60 fields) NTSC Color Signal

(d) Video Recording System: 2 rotary heads, helical scanning system Luminance; FM azimuth recording color signal; Converted subcarrier phase shift recording.

(e) Audio Track: 2 tracks

(f) Tape Format: Tape width 1/2 inch (12.77mm) high density tape

(g) Tape Speed: SP 1 5/16 i.p.s. (33.35mm/s) SLP; 7/16 i.p.s. (11.12 mm/s)

(h) Record/Playback Time: 360 minutes with T-120 in SLP mode

(i) FF/REW Time: Less than 6 minutes with T-120

(j) Heads: Video; 4 rotary heads, Audio/control; 1 stationary head, erase; 1 full track erase for audio dubbing.

(k) Input Level: Video; Tuner connector 1.0V p-p, 75 ohm unbalanced, camera input terminal - 1.0V p-p 75 ohm unbalanced, "VIDEO IN" - connector (BNC) - 1.0V p-p 75 ohm unbalanced

(l) Input Level: Audio; - 16dB 5K ohm unbalanced, Camera input terminal -20dB, 50K ohm unbalanced "MIC IN" jack X2-70dB, 47 K ohm unbalanced "LINE IN" jack X2 (RCA) -20dB, over 50K ohm unbalanced

(m) Output Level: Video "VIDEO OUT" connector (BNC) 1.0V p-p, 75 ohm unbalanced.

(n) Output Level: Audio, "LINE OUT" jack X2 (RCA) - 9dB, less than 1 K ohm unbalanced, "AUDIO MONITOR OUT" jack (RCA) - 9dB, less than 1 k ohm unbalanced

(o) RF modulated; channel 3 or 4 67dBu (open voltage), 75 ohm unbalanced

(p) Video Horizontal Resolution (monoscope test Pattern): color; more than 240 lines

(q) Audio Frequency Response: 50 Hz. - 10 KHz. in SP mode

(r) Signal-to-noise Ratio: Video; Better than 45 dB (Rohde & Schwarz noise meter)

(s) Signal-to-Noise Ratio: Audio, Better than 48 dB (Dolby NR in)

(t) Operating Temperature: 41 - 104 degrees F (5-40 degreesC)

(u) Operating Humidity: 35% to 80%

(v) Weight: Approximately 36.3 lbs (16.5 Kg)

(w) Dimensions (W x H X D) 17 3/4" x 6 5/8" x 16 13/16" (450mm x 168mmx 426mm)

(x) Accessories to include:

- 1 piece wireless remote controller (VSQ0227)
- 1 piece VHF matching box 75 to 300 ohm transformer (VSQ0015)
- 1 piece 300 to 75 ohm transformer (VFA0010)
- 1 piece coaxial cable with one-touch type F connector (VJA0147)
- 1 piece twin-lead cable (VJA0102)
- 1 piece F Connector (VSQ0051)
- 2 pieces - batteries for wireless remote control

(y) Features to be included:

- Single knob multi-speed control
- Microprocessor Program Access
- Remaining time and tape end warning in digital counter
- Auto rewind and memory stop
- Front loading - front operation
- Tracking and slow tracking controls
- Frame advance to allow single frame advancing
- Forward and reverse search
- Tape protection circuit

(z) Miscellaneous - to include operator, and service manuals with schematic diagrams.

(2) Thirteen (13) - Sony 19" color video monitors model PVM-1910, to include the following:

(a) Color System: NTSC system

(b) Picture Tube: Trinitron tube, 19 inch measured diagonally, 100 degree deflection angle.

(c) Resolution: 350 TV lines, 440 x 240 dots

(d) Color Temperature: 6,500 degree K/9,300 K switchable

(e) Frequency Response: 8 megahertz (-3db, RGB), 6 megahertz (-3db, composite video)

(f) Horizontal Linearity: plus or minus 5%

(g) Verticle Linearity: plus or minus 5%

(h) Line Pull Range: Horizontal plus or minus 500 Hz., Verticle 8 Hz

(i) Overscan of the Picture: 5%

(j) Return Loss: 4 MHz., 35 db (Line A, Line B)

(k) Zooming: Within 2%

(l) Covergence: central area 1mm, outside of central area 1.3mm

(m) Brightness: More than 500 foot-lamberts

(n) Inputs:

- TUNER: 6-pin DIN connector
- VIDEO IN: BNC connector
- VTR: 8-pin connector (pins 2 and 6) composite 1V p-p plus or minus 6 db, sync negative, 75 ohms and high impedance switchable
- AUDIO IN: Minijack
  VTR: 8-pin connector (pins 1 and 5) -5db high impedance
- EXT SYNC IN: BNC connector composite sync 2-8 vp-p, negative, 75 ohms and high impedance switchable
- RGB IN: BNC connectors 0.7V p-p, non-composite
- AUDIO (RGB) IN: Minijack -5db high impedance

(o) Outputs: Loop through

- VIDEO OUT: BNC connector
- AUDIO OUT: Minijack
- EXT SYNC OUT: BNC connector
- RGB OUT: BNC connector
- AUDIO (RGB) OUT: Minijack

(p) Audio output: 1.5 watt

(q) Power Requirement: 120 V AC, 60 Hz.

(r) Power Consumption: 120 watts (max.)

(s) Dimensions: Approximately 18 1/4" x 19 1/4" x 21 1/4" (HWD)

(t) Weight: Approximately 63 lb. 15 oz.

(u) Miscellaneous: to include operator and service manuals with schematic diagrams.

B. Microcomputer System - IBM 3270 PC-AT 5273 System Unit to include the following:

1. Minimum of 640 kilobytes of random access memory (RAM).

2. 20 megabytes fixed disk drive IBM, feature code 0205

3. One 5 1/4" double sided diskette drive, capable of storing 360 kilobytes, IBM feature code 0207.

4. One 5 1/4" high capacity diskette drive, capable of storing 1.2 megabytes, IBM feature code 0206.

5. Clock/calendar with battery backup.

6. ROM based BASIC language supported

7. Type microprocessor - Intel 80286

8. Eight system expansion slots

9. 5272 Color display adapter

10. 5271 - Keyboard, Keyboard Adapter and Keyboard cable

11. One fixed disk and diskette drive adaptor.

12. One serial/parallel adaptor

13. Keylock feature

14. Microcomputer control program must provide an equivalent function to the IBM 3270 PC control program Version 2.1 and have the ability to provide file transfer between the system unit, via a 3274/76 control unit and interface with an IBM TSO file transfer program number 5665-311 which is currently installed on the IBM 3081 main frame.

15. Power requirement: 115 volt, 60 Hz. Commercial power supply

16. Display Unit - IBM 5272 color with the following features:

    (a) Color monitor and interface capable of working with system unit

    (b) Pixel resolution of 720 by 350

17. Color Printer - IBM 5182 - model 1 with the following features:

    (a) Draft print speed of 200 characters per second bidirectional, 110 characters per second correspondence quality bidirectional, and 40 characters per second letter quality.

    (b) Ability to print 132 characters across a pitch of 10 characters per inch.

    (c) Adjustable tractor feed and automatic single sheet feeder

    (d) Parallel interface capability

    (e) Must have IBM control codes stored in read only memory (ROM)

    (f) Paper rack - IBM feature code 0101

    (g) Printer cable - IBM feature code 5612

EXHIBIT C

OKLAHOMA DEPARTMENT OF TRANSPORTATION

Videologging System Specifications

SPECIFICATIONS

The van shall be modified to include carpeting and insulation package and alterations to accommodate equipment and other miscellaneous items. Camera will be mounted inside the van. Mounting frame for camera, camera mount, and associated control racks shall be assembled in such a manner as to fit a 1985 Chevrolet Model G van. These frames and/or racks shall allow the camera and assembly to be easily moved to allow removal of the engine cowl for routine maintenance.

Basic to the system will be that it makes two ½" VHS copies of videologged material simultaneously. Single control and separate control of recorders shall be provided in the record start, record pause, record stop, play start and play stop, and stop modes as a minimum. Exceptions or additions to this capability shall be noted in bid. Microphone for audio tracks shall also be input to both recorders.

The display of information will be at the top of each frame and as a minimum shall include:

1. Highway Name:
   Example: US-281B Two alpha, dash*, three numeric, one alpha (maximum).

2. County Name:
   Example: COMANCHE Nine alphas (maximum)

3. Control Section:
   Example: 281-16-68 Three numerics, dash, two numerics, dash, two numerics (maximum).

4. Direction of Section:
   Example: N One of four alphas N, S, E, and W, general direction of travel.

5. Mileage:
   Example: 21.04 (from DMI) Four numerics; tens and hundredth of mile, with decimal point. .

6. Month, Day, Year:
   Example: 12-03-85 Two numerics, dash, two numerics, dash and two numerics.

7. Time:
   24 hour or AM, PM, Designation.

Final layout of information to be approved by ODOT personnel and will generally be as shown in lines from left to right as in the example, below:

US-281B COMANCHE 281-16-68 N 21.04
12-03-85 09:31

* All dashes to be permanent if possible.

-1230

This videologging system shall include all associated cables, meters, connectors, racks, seats, and associated fittings to complete the installation.

Also provided will be complete operation manuals (2 sets) and accessories including all schematics and drawings, any special tools or cleaning instruments, operating instructions, and training of personnel in use of equipment will be provided. (Number of days training suggested by bidder _____).

All equipment shall be capable of operating under extreme range of Oklahoma ambient temperatures of 0° to 110° in the environment of a closed vehicle.

BASIC EQUIPMENT

1. Camera - Three Tube Color Video
   a. J.V.C. Model 210

2. Power Zoom Lens
   a. J.V.C. Model HZ - E512

3. Camera View Finder
   a. JVC Model VF 215

4. Video Distribution Amplifier
   a. Panasonic Model WJ 300B

5. Video Camera Pan and Tilt
   a. Panasonic Model WV - 7230B

6. Remote Control for Camera Pan and Tilt
   a. Panasonic Model WV 7330

7. Video AC Camera Adapter
   a. J.V.C. Model AA - P 26U

8. Two (2) Video Recorder/Players ½" VHS
   a. J.V.C. BR 6200U

9. Microphone - Omni Directional
   a. Audio Technical - AT 805S

10. Video Mixer
    a. Rapid Tech Model 77C

11. Two (2) Video Color Monitors
    a. Panasonic CT 7711A

12. Power Inverter
    a. Best - D.C. to 120V A.C.
    b. A.C. Power Meter
    c. D.C. Power Meter

13. Distance Measuring Instrument
    a. Transwave Model NK 1203

14. Surge Protector and Multiplug
    a. S. L. Waber

15. Vehicle Equipment Cabinets

16. Video Recorder/Player - ½"VHS (For Playing Inhouse)
    a. Panasonic NV - 8950

17. Digitizing Tablets
    a. Keyport 300

18. Graphics
    a. Techmar Graphics Master - Part No. 20037

19. IBM XT(DOS 2.0) Compatible Computer
    a. 256K R.A.M.
    b. Double Disk Drive 5.25" Floppy Disk
       (DSDD 40 Track Soft Sectored Disks)
    c. 9" Video Screen - Green (Integral to Unit)
    d. Detachable Keyboard - IBM Layout
    e. Parallel/Serial Printer & Communication Ports
    f. Software - Designed by ~~Roadnet~~ for our Application
    g. Peripheral for Data Acquisition & Auto Date and Time
    h. IBM 8088 Processor and Math Coprocessor

20. Multifunction Expansion Board - SPK 384
    a. A.S.T. Research - Memory Expansion to
       640K

21. Video Color Monitor - 19" (For Viewing In House)
    a. Sony Model PVM 1910

22. Miscellaneous
    a. Burglar Alarm

EXHIBIT D

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION

Videologging System

WASHINGTON STATE'S VIDEOLOGGING SYSTEM

by

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and
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BACKGROUND

The Washington State Department of Transportation (WSDOT) had operated a 35mm photologging system since 1970. During the first two years a Robot camera was used which did not do all the things we wanted. In 1972 we purchased our first of two Flight Research cameras and since then have maintained a very high quality photologging system. During the 1972-1980 period, we had taken approximately ten million pictures and the mechanism operating the camera was worn out. Consequently, in the latter part of 1980, we started investigating second generation equipment to upgrade our photologging system.

Security Record Systems, since then renamed Mobile Video Technology, Inc. (MVTI), of Olympia, Washington was doing some research in video recording and invited us to a demonstration. We subsequently viewed another video demonstration at Techwest Enterprises, Ltd., in Vancouver, B.C. In both instances the picture detail was not as good as the 35mm camera pictures, but was considered adequate for the purposes for which it was intended. It was determined that we could purchase the videologging system for approximately the same amount of money as one year's film cost (as used in the photolog system). This cost was estimated at between $40,000 and $50,000.

Since the picture quality was acceptable to our Department personnel and for use in courtrooms as evidence for the state; and the cost estimates were favorable, we decided to switch from photologging to videologging, provided an operational system could be produced by the vendor. Without committing the State, a Letter of Interest was given to the vendors to encourage them to develop the new system.

MVTI was awarded the bid for the field data collection portion, for approximately $35,000, which was to be installed as a complete operating unit in the Dodge van purchased by the Department. The data viewing portion (monitors and recorder-player units) were purchased under a separate contract from Photo and Sound Company of Seattle, Washington for approximately $10,000. The specifications for the equipment are included in Attachment 1.

FIELD OPERATION EXPERIENCE

We had some problems, as anyone who has attempted to put together a videologging system surely knows. The problems basically involved the mini-computer and the video resolution. However, we were able to overcome these problems with the combined expertise of the vendor, MVTI, and our own staff personnel who are knowledgeable in the capabilities and drawbacks of minicomputers.

Resolving the problems in the mini-computer required knowledge of the hardware and also required creating part of the software -- that is, the instructions the computer could understand and accept. The major problem involved processing the distance-measuring signal from the sensing unit prior to receiving the next signal.

Each signal had to be checked, for example, to determine if there was a milepost equation at that location. When a signal was missed, the distance computed would be in error. There was no existing software which would accomplish what we needed.

The video resolution problem involved an extremely narrow depth of field. After some experimentation, we increased the field depth by leaving the turret set for 3200K (indoor lighting) and using two 72mm screw type filters in front of the lens. The first filter absorbs the ultra violet rays, which improves object distinction and reduces haze. The second filter corrects color for outdoor use. This greatly increased the depth of field by allowing bright sun iris (aperture setting) operation at between f 11 and f 16 with the lens focused at 30 feet.

The best operating speed for this system is between 35 mph and 40 mph. We have experienced better video resolution and better overall results at this speed. We are presently trying to increase the speed to 55 mph by purchasing a recently developed computer board. We believe that by next summer we will have the system operational at 50 to 55 mph.

OFFICE OPERATIONS EXPERIENCE

The data in the field are recorded on 3/4 inch cassettes. These cassettes are used as the masters to make duplicate copies and will become part of our history file when that portion of roadway is relogged. All copies for viewing in our Headquarters Divisions and in our Districts are copied on 1/2 inch cassettes.

We are using three half-inch player-recorders to make the three copies we require. As picture resolution deteriorates somewhat when copies are made, it is

recommended that copies be made from the original cassettes. At this time, it is a manual operation; however, we are looking at the possibility of gang connecting a single play-record switch to make three copies simultaneously. This will involve using a distribution amplifier, a signal enhancer, a control panel locking all equipment together for the play, record and rewind modes, a switch mechanism for monitoring each recorder-player and a running-time clock for each of the machines.

ADVANTAGES OF THE VIDEO SYSTEM

The principal advantage of a videologging system is the savings in dollars compared to the photologging system. Another major advantage is the response time. The video system provides a copy for viewing immediately, whereas developing the film from the photologging system required from two to four weeks. Ease of operation can also be considered an advantage, although it cannot be attributed directly to the development of this system.

OPERATIONAL APPLICATIONS

The video cassettes are used extensively throughout Headquarters and the Districts. They are used by Design, Traffic, Maintenance, Construction, Accident Location, etc. They are also used as state evidence in court, in tort claims and wrongful death suits against the Department.

FUTURE EXTENSIONS OF THIS TECHNOLOGY

We are relying on this system more and more for information previously gathered in the field. The video tapes are being used for accident location and modifications to the State Route Milepost Log (roadway data) file.

We are also experimenting with a grid pattern overlay for distance measurements. The success of this type of measuring will depend on the accuracy required by the user. It does look promising, however.

COSTS COMPARISIONS - VIDEOLOGGING VS. PHOTOLOGGING

We have a total of six districts which are videologged on a two-year cycle. We have completed field operations for the three districts scheduled for this year. We have also completed the office operation for one of these districts, i.e., the editing and re-recording from the 3/4-inch master cassette to the three ½-inch cassette copies which we require. The savings was $7,600 for the district. When we began recycling the cassettes, the savings will be in the area of the $30,000 per year which we had anticipated.

Typical costs:

The following costs are based on our experience in one of the districts videologged in 1982.

Lane miles videologged = 2,493

Number of 3/4 inch (60 minute) cassettes used in the field = 72

Average lane miles per cassette = 34.6

Number of 1/2 inch (120 minute) cassettes used to make copies = 40. Average lane miles per cassette = 62.3. Three sets (120 cassettes) are required.

Video cassette cost:

72 3/4 inch cassettes at $19.35 each =	$ 1,393
120 ½ inch cassettes at $11.95 each =	1,434
TOTAL COST	$ 2,827

1980 35 mm photolog cost for the District:

Note: Average 60 miles filmed on a 400 foot reel of 35 mm color film.

42 400 foot rolls at $100 each	=	$ 4,200
Process negative at .056 per foot x 16,800 ft.	=	941
Process negative to get 3 positive prints .1049 per foot (16,800) x 3	=	5,287
TOTAL COST		$ 10,428

Savings by using video = $7,601

POSSIBLE AREAS OF IMPROVEMENT

We are satisfied with the performance of the system to this point. However, the following are areas we plan to pursue for video system improvements:

Clarity and Sharpness

While video cassettes will not produce an image comparable to film, we believe a better product can be achieved. Testing is now being done on different camera angles and zoom lens adjustments. Panning with the camera rather than the present fixed angle videologging is also being tried. A major item of effort is to improve the legibility of the smaller signs. The results should be available in about three months.

Measurements

Once the most acceptable camera angles are established, we plan to develop the procedures to take measurements from the video screen. If successful, the data may be used to update various state route data files.

Vibration

The gyro system presently employed does aid in dampening vibration when using a wide angle lens setting. It is not sufficient when using a longer zoom setting. We plan to investigate a softer suspension apparatus for the camera.

Computer Program Modification

We plan to modify several areas in the computer programs. These changes are mainly to aid the operator in the field. As a result, it will also improve efficiency.

OBSERVATIONS

We are very pleased with this system. We would be happy to show this system to anyone interested in videologging and would also welcome questions on any technical problems encountered, or on our solutions for some of the problems we resolved.

3/R11

A SELECTED ANNOTATED BIBLIOGRAPHY OF TRANSPORTATION ASSOCIATED USES FOR VIDEOTAPE 1969-1986

I. Law Enforcement

Law enforcement agencies throughout the United States have employed videotape in myriad applications. In the early 1970's, the medium was used to record the behavior of drivers who were apprehended as DWI suspects. These tapes were used both as evidence and in rehabilitation efforts. This practice has been discontinued partially due to the increased reliability of breath, blood, and urine analysis testing procedures and partially because of the expense of the video equipment. In addition, videotape has been used for surveillance of traffic violations and in various law enforcement training programs.

1. Brennan, M.E., LeBlanc, A.G. (1973). Use of videotape and personality testing in detection and study of drinking drivers. Police Chief, 40 (12), 58-67.

   A study of drunk drivers in Coronado, California, is presented. The Coronado police force utilizes videotape at the point of apprehension, and breath, blood, or urine analysis at the station to determine the blood alcohol content (BAC). Detailed discussion is included regarding military personnel who, though they have a high BAC, show no evidence of it at the videotaping. Various hypotheses are presented to explain this and to explain why so many military personnel are apprehended. It appears that individuals with a high BAC do not feel their ability to drive is impaired. (DIALOG)

2. Casswell, S. (1982). Driving behavior of cannabis users and non-users in closed-course and normal traffic situation. In American Association for Auto Medicine Conference Proceedings, Vol. 2 (pp. 330-341).

   In an effort to determine the effects of cannabis on driving behavior, user and nonuser behavior was compared on a closed course and in a normal traffic situation. Drivers were matched for age, education, and driving history. Subjects were tested using perceptual and decision-making tasks and high speed driving. Each subject was monitored by videotape recorder in the car while driving the experimental track. No behavioral difference was found in the two groups on consistent driving patterns. Differences were found, however, in overtaking behavior. This suggests some difference may exist in the non-intoxicated driving pattern of cannabis users when compared to non-users.

3. Fales, E.D., Jr. Watch it! You're on trooper T.V. Popular Mechanics.

   The Connecticut State Police are carrying videotape equipment in their patrol cars to record traffic violations. This videotape is then used as court evidence.

4. Harris, F. (1983). The drunk driver. New approaches to an old problem. FBI Law Enforcement Bulletin, 11-13.

Creve Coeur, Mo., has combined the old with the new in its approach to drunk driving. Their program consists of two phases--the traditional and the electronic. The traditional phase includes increased enforcement of closing hours for establishments which sell alcohol, increased patrols, and publishing the names of people arrested and charged with drunk driving in major newspapers. The electronic phase involves the passage of a city ordinance that requires all cocktail lounges and restaurants licensed to sell liguor by the drink (with sales of $100,000 or more annually) to install a breath analyzing machine. In addition, the car-with-the-camera program has been reinstituted; it is used to videotape traffic offenses and record conversations through a wireless microphone. All events electronically recorded are permanently maintained for evidence in court.

5. National Highway Traffic Safety Administration. (1984). Improved sobriety testing. Washington, D.C.

The National Highway Traffic Safety Administration has written a manual to acquaint the reader with the most effective procedures for testing drivers at roadside to determine intoxication. Police officers generally evaluate a driver's physical appearance and condition, including condition of eyes, breath odor, color of face, demeanor, dexterity, speech, and clothing. Further testing is administered if the officer suspects intoxication. Testing and scoring procedures have been standardized and evaluated both in the laboratory and in the field. To assist officers in learning and practicing testing techniques, a videotape was prepared which explains and illustrates the tests.

6. Merrill, Darwin, Maranville, Irvin W. (1972). The use of video tape in driving while intoxicated enforcement in the state of Vermont (Project CRASH). Waterbury: Vermont Department of Mental Health.

Vermont's Alcohol Safety Action Project known as project CRASH (Countermeasures Related To Alcohol Safety On The Highways) used videotape evidence to increase driving-while-intoxicated convictions. Over a year's time, videotape was admitted into court as evidence only once. The use of audiotape, however, has proven to be helpful, inexpensive, and admissable as evidence.

7. Pilot, J. (1969). Instant re-play for the traffic violator; New Hampshire state police become T.V. producers. Law and Order, 17 (6), 38-41.

Portable videotape units are being used by the New Hampshire State Police in the apprehension and conviction of traffic violators. Videotape is acceptable proof of tailgating, driving under the influence of alcohol, driving too slow and other violations. In addition, videotape's role in highway safety is discussed.

8. Review and Analysis of ASAP Enforcement Effort. (Final Report. Vol. 6. Individual Site Reports). (1975). Washington D. C.: Planning and Human Systems, Inc.

In an effort to reduce drunk driving, the Alcohol Safety Action Project tried many new methods of education, detection, and enforcement. Videotape was used in many localities to capture in pictures and words, driver performance and response to instruction. These videotapes were then used as evidence (when admissible) in court. The use of videotape in some states was found to lead to increased guilty pleas, a reduction in altercations, and rehabilitation benefits. For the last few years there has been a steady decline in the use of videotape as a result of plea bargaining and increased production costs. Many states opted for the use of audio tape after a trial run with videotape. This report is comprised of individual site reports in the ASAP effort. These reports show forms and documents used in connection with processing drunk drivers. The use of video and audio recording equipment to record suspects' reactions and behavior is discussed. Legislative provisions pertaining to the operation of a vehicle while under the influence of alcohol is also discussed. A partial list of cities and states with site reports includes: Vermont, Utah (Salt Lake County), Minnesota (Hennepin County), Louisiana (New Orleans), Indiana (Indianapolis), California (Los Angeles County), Florida (Hillsborough County), Georgia (Columbus), Virginia (Fairfax County), Texas (San Antonio), Missouri (Kansas City), Nebraska (Lincoln), New Hampshire, Ohio (Cincinnati), Oklahoma (Olkahoma City), Maine (Cumberland), and Maryland (Baltimore).

II. Research and Field Documentation

Videotape is often used in research for data collection or as a documentation tool. It can be used for data collection at times and locations that may be difficult for manual collection. Tapes of special methods and procedures can be recorded for instructional use or for informational purposes.

10. Bragg, B.W.E., Finn, P. (1982). Young Driver Risk-Taking Research. Technical Report of Experimental Study, Final Report. Cambridge: ABT Associates.

    This report gives the results of an experiment conducted to determine if younger, less experienced drivers perceive the risk of an accident differently from older drivers. Videotapes, as well as pictures, were used to allow subjects to rate the risk of an accident. The results showed that young drivers perceive the situation differently from more experienced ones.

11. Brewer, K.A., Ring, S.L. Erratic maneuvers as an interchange design feedback tool (Transportation Research Record No. 562). Washington, D. C.: Transportation Research Board.

    Establishing basic design, safety, and aesthetic standards for interchanges does not guarantee that there will be no problems. A designer still faces a high degree of uncertainty regarding actual operation. Actual behavior at existing facilities can be used in establishing design criteria for future ones. One way to determine if actual behavior conforms to presumed behavior is to observe and analyze actual driver behavior. The research discussed in this report concerns itself with the operating characteristics of a freeway-to-freeway interchange in Council Bluffs, Iowa. A driver behavior analysis was conducted using videotape records of operations.

12. Bridge deck inspections go faster using infrared thermography. (1983). Better Roads, 53 (11), 28-29.

    In an effort to decrease inspection time, six bridges in Cedar Rapids, Iowa, were inspected using conventional videotape and infrared thermography. An infrared inspection of each deck was completed to detect areas of delamination. Conventional video inspection of the top surface was completed along with the infrared inspection to record the condition of the deck.

13. Brimson, T.A., Caldwell, R.D. (1984). Kerb use at airport terminals. Vermont (Australia): Road Research Board Vermont, 12 (6), 79-89.

    This paper describes a traffic data collection method in which videotape recording was used to determine the length of

time vehicles stay at airport terminal kerbs. Results show that length of kerb stay is dependent on the vehicle type, location of passenger baggage, terminal type, and whether or not the driver entered the terminal.

14. Brown, B.C. Detection of Concrete Delamination by Infrared Thermography. Ames: Iowa Department of Transportation. In Progress.

An infrared thermograph survey using a video camera was conducted on 15 bridges with P.C. Concrete pavement overlay. The results of this survey will be compared to those using a Delamtect, an accepted method for identifying delaminations. (DIALOG)

15. Brown, P., Geib, P., Leonard, R. (1980). Monitoring field installation of impact energy attenuators by videotape. Los Angeles: California Department of Transportation.

Volume I of this report discusses the secondary effects on passing vehicles when impact energy attenuators are used. Data for this report were recorded over a five-year period with commercial videotape. Three types of impact energy attenuators were monitored. Volume II of this report discusses the use of and effectiveness of videotape as a research tool, and provides evaluations of various types of video equipment.

16. Erikson, B., Hoeberg, U. (1980). The influence of speed reducing bumps on the search behavior of road users. Uppsala: Uppsala University, Sweden Psyklogiska Institution.

Videotape and film were used to record head movements of 1446 pedestrians and the corneal reflections of drivers. This information was used to determine the effect of pedestrian and driver behavior when speed bumps were introduced at crossings. Results showed that drivers paid more attention to the road than to the pedestrians after the bumps were installed.

17. Freedman, K., Humpheys, M. Emergency release from two child restraints. Roseberry (Australia): New South Wales Dept. of Motor Transport, Australia Traffic Accident Research Unit.

Child restraint seats are for crash protection. The need to make the release mechanism child proof yet not difficult for adults to release has been studied using videotapes. These tapes were examined to determine problems encountered with child restraint seats. Variables such as sex of rescuer, type of occupant (child/dummy), familiarity with restraint system, familiarity with child, lighting levels, and age of occupant were tested.

18. Graham, N.R. (1982). Validation of signalized intersection survey method (Transportation Research Record No. 841). Washington D. C.: Transportation Research Board.

The development and validation of a manual survey method for the measurement of performance at signalized intersections is described in this paper. The method is easy to use in the field and requires that queue lengths and flows be measured at particular times within each cycle of the traffic signals on each approach being surveyed. The validation of this survey method was performed by comparing these new survey measurements with measurements obtained by viewing a videotape of the same traffic stream and extracting the same data from the tape. The comparison concluded that the survey method is a simple, yet accurate, way of determining signalized intersection performance levels.

19. Hayden, R.L. (1982). Mt. Vernon Canyon Runaway Truck Escape Ramp. Denver: Colorado Department of Highways.

A closed circuit TV surveillance system was used to record 23 trucks using this escape ramp. Data from the videotape were used to determine the distances needed for vehicles travelling at various speeds to stop.

20. Hoegerg, V., Eriksson, B. The influence of signalized crossings on the search behaviour of pedestrians and cyclists. Uppsala University, Uppsala, Sweden.

Previous study results showing the behavior of pedestrians at crossings with and without traffic lights indicate that pedestrians searched less actively when crossing with traffic lights. The responses of pedestrians and cyclists to various new signals will be studied using videotape and film.

21. Huffine, W.W., Cargill, L.M. Implementation of roadside erosion control research results. Oklahoma City: Oklahoma Department of Transportation.

The purpose of this project is to develop maintenance activities to minimize the amount of work and time needed to complete needed upkeep on highway rights of way. These maintenance activities will be documented on videotape and made available to field divisions for use in training.

22. Johnson, D.W., Trial aids in highway condemnation cases. In Selected Studies in Highway Law (pp. 383-400). Washington, D. C.: Transportation Research Board.

This report points out the utility of using videotape in highway condemnation cases. These tapes are used to present the jury with the conditions of the properties in question before and after the condemnation.

23. Kirby, C., Stroud, P.G. (1978). Effect of motorcyclists' high visibility aids on driver gap acceptance. Traffic Engineering and Control, 19, (8 and 9), 401-3.

Videotape was used to collect data to investigate the effect of high visibility motorcycle aids on driver gap acceptance. The videotape was analyzed at one-fifth normal speed.

24. Kulmala, R., Makinen, T. (1983). The effects of a stop sign at railway grade crossings. Espoo: Technical Research Center of Finland.

A study was conducted to determine the effect of stop signs at railway grade crossings. Videotaping equipment was employed to observe traffic behavior at various sites.

25. Middlebrooks, P.B. (1976). Freeway wrong way entry study. Atlanta: Georgia.

Traffic behavior was monitored for 17 nights on the East Ponce de Leon Avenue exit ramp from I-285 southbound near Atlanta. Time lapse videotaping was used to determine the effectiveness of a state-of-the-art wrong-way entry prevention device. Six wrong-way movements were observed and findings show that additional steps need to be taken to reduce wrong-way entries.

26. Nemeth, Z.A., Rockwell, T.H., Smith, B.L. Recommended delineation treatments of selected situations on rural state highways. Columbus: Ohio State University Transplex. (In Progress.)

This research project will assess the impact on safety of raised pavement markers as a night time visual guidance system. It will also develop a methodology for using human observers to assess roadway delineation systems. Comparison of observer results between direct views of road delineation and videotapes of the same roadways will be used.

27. Nilsson, G. (1983). Risk measures for unprotected road users. Linkoeping: National Swedish Road and Traffic Research Institute.

Accidents involving unprotected road users (pedestrians and cyclists) and vehicles usually result in injury to the unprotected road user. A survey showed that there is a lack of risk measures for unprotected road users because of a lack of information about pedestrian and cyclist flows. Videotape was used to establish risk measurements. These tapes were used to record the relationship between the degree of separation of pedestrians during the day and accidents for the corresponding periods.

28. Richardson, A.J., Graham, N.R. (1981). Validation of a signalised intersection survey method (Civil Engineering Paper N81/8). Monash University, Australia.

This paper describes the development and validation of a manual survey method for the measurement of performance at signalised intersections. The validation of the survey method was performed by comparison of field survey measurements with measures obtained from a videotaped recording of intersection operation. The validation study showed negligible observer error and minimal theoretical error in the survey method.

29. Snyder, R.A., Brown, P.L., Geib, P.C., Keeling, R.C. (1974). Monitoring field installations of impact energy attenuators by videotape. Sacramento: California Department of Transportation, Division of Highways, Traffic Branch.

Three types of impact energy attenuators were monitored for two years using a modified commercially available videotape recorder. Night coverage of the attenuators was made possible by using an infrared sensitive Tivicon tube. Results show that attenuators are effective, but additional study is needed regarding the effect a collision with the attenuator has on uninvolved traffic.

30. Triggs, T.J. (1980). Influence of oncoming vehicles on automobile lateral position. Human Factors, 22 (4), 427-33.

Videotapes were made from a following vehicle in order to determine what effect oncoming automobiles have on the lateral displacement of vehicles headed in the opposite direction. Cameras mounted in the experimental vehicle allowed video records to be made of the vehicle being followed. Analysis of the videotapes showed a systematic linear movement away from the centerline as vehicles approach from the opposite direction.

31. Waterfall, R.C., Dickinson, K.W. (1984). Image processing applied to traffic. Traffic Engineering and Control, 25 (2), 60-67.

The development of an automated image-analysis system for recording and analyzing road traffic movements is discussed. Methods for detecting vehicles in a video scene and reducing the effects of noise in the image are presented. The performance and suitability of solid-state, CCTV, and infrared cameras are considered. Field trials show that 94% of vehicles observed by a human operator were also identified by the image analysis system. Currently, image processing is limited to simple procedures such as traffic counts. The report outlines the limitations of the system and indicates what improvements in it are necessary.

32. Wilson E., Williams, B.R. Developing and evaluating a procedure for determining the effectiveness of symbol signing in construction zones and other areas. Laramie: Wyoming University, Department of Civil Engineering.

In an effort to better understand driver comprehension of roadway signs, a program using a videotape of signs on the highway was compared to a program in which respondents were asked the meaning of a photograph of a sign. Both methods were evaluated using six symbol signs. Signs used were lane drop-off, narrow bridge, shoulder drop-off, school zone, truck tipping, and signal ahead signs. The videotape elicited the largest number of correct responses, indicating that signs not viewed in an authentic environment are not correctly identified by respondents.

III. TRAFFIC CHARACTERISTICS AND CONTROL

Videotape has been used in traffic applications to collect various types of information. Volume, classification, flow, conflict, and speeds can be accurately recorded and analyzed using videotape. This medium has also been used in traffic counting but data extraction appears to be more time consuming than mechanical counting.

33. Allen, B.L. et al. Analysis of traffic conflicts and collisions (Transportation Research Record, No. 667, 67-74). Washington, D. C.: Transportation Research Board.

Sequences of collisions and conflicts were videotaped and analyzed to determine the parameters of events leading to a traffic collision or conflict. Preliminary investigations revealed that using the common method of brake application is not adequate for describing conflict. Seven methods of defining a conflict situation are introduced and evaluated. As a result of this study two more practical and reliable applications of traffic conflict techniques were developed.

34. Ashworth, R. (1976). A video tape recording system for traffic data collection and analysis. Traffic Engineering and Control, 17 (11), 468-70.

A portable videotape recording system used to collect and analyze traffic data is described. This system has a digital timer that can be superimposed either in the field or in the lab. A comparison is made in both performance and cost between this system and conventional time-lapse photography.

35. Barrett, N. (1982). Complex monitoring confirms a simple flow solution. New Civil Engineer, 513, 28-30.

The M1 motorway was studied during 1982 at a point where two lanes cross over together and an experimental contraflow system has been installed. Video cameras and recorders were used to monitor this system. As many as six cameras were used per site with at least one on every entrance or exit of the crossover.

36. Brown, A. M., Churly, A. (1982). Parking surveys and the use of VISTA in West Sussex. Traffic Engineering and Control, 23 (12), 590-94.

Recent developments using videotape as a collection medium for parking data are described in this paper. The subsequent adaptation of VISTA for parking analysis through VISTApark is explained and the effectiveness of VISTApark is evaluated.

37. Dahlquist, C., Lindeloef, A. (1980). A video system for traffic studies in the field (Videosystem Foer Trafikstudier I Faelt). Linkoeping: Statens Vaeg-och Trafikstitut.

This report is a technical description of a video technical measurement system used to study traffic behavior at rural road intersections. The system consists of video cameras, monitors, time generator, point generator and videotape recorders. It runs on a 220v portable generator.

38. Dickinson, K.W. and Waterfall, R.C. (1984). Image processing applied to traffic, 1-A general review. Traffic Engineering and Control, 25 (1), 6-13.

This report reviews the subject of image processing, which is a method of reading videotape using a computer. Several systems being developed specifically for traffic data collection are discussed. General comments are made concerning the suitability of video image processing for gathering various types of road data.

39. Dods, J.S. (1982). The ARRB lateral position indicator. ARRB Technical Manual.

To assess driver path control, vehicle lateral position must be monitored continously. A system based on centerline measurements developed by ARRB is described in this report. Night operation is possible by use of a high sensitivity video camera with automatic iris. Signals from the camera produce clock pulses that are relayed to a binary computer. The binary computer output is interfaced with a microprocessor data logging system in the vehicle. A one-line LED display of the road surface facilitates initial contrast adjustment and the output is designed so the device may be interfaced with other recording equipment.

40. Hilger, B. Analysis of accident rates along urban freeways to determine where and when added enforcement of other remedial measures are required. College Station: Texas A&M University, Texas Transportation Institute.

Videotape recordings along with speed studies and site investigations will be used to identify characteristics of high accident locations. Probable causes will be identified and countermeasures suggested.

41. Van der Horst, A.R.A. (1982). The analysis of traffic behaviour by video. Proceedings of the Third International Workshop on Traffic Conflicts Techniques. Liedschndam, Netherlands: Institute for Road Safety Research.

Traffic behavior was recorded using videotape. It was found that videotaping traffic behavior provides information

about the effect of road design elements. Videotape also provides a means for the analysis of the behavior of road users.

42. McKnight, A.J., Weir, D.H. (1980). Analysis of moped rider performance. Linthicum, Maryland: Motorcycle Safety Foundation.

Two studies were performed to compare basic control skills and rider error of novice and experienced moped riders. The first study compared basic control maneuvers on a test course, whereas the second involved videotaping of mopeds' operations in highway traffic and documenting the most frequent errors.

43. Opeila, K.S., Khasnabis, S., Datta, T.K., Sorton, A., Lehman, J. (1980). Determination of the characteristics of bicycle traffic at urban intersections. (Transportation Research Record No 743, 30-38). Washington, D.C.: Transportation Research Board.

Bicycle traffic at urban intersections was studied to determine characteristics representative of this mode of travel. Videotape recordings were used to help record these characteristics and to compare operation under different situations.

44. Polus, A., (1983). Gap acceptance characteristics at unsignalized urban intersections. Traffic Engineering and Control 24 (5), 255-258.

Accepted and rejected gaps and lags, critical gaps and lags, and traffic flow characteristics at two unsignalized t-junctions were investigated. Data were collected by clock triggered switches on the road surface, and a video camera was used to record vehicle movements.

45. Schurmeier, H.M. (1980). SCAN (sensor for control of arterials and networks)-- An application of advanced image processing technology to traffic surveillance. Piscataway, New Jersey: Institute of Electrical and Electronics Engineers.

One of the major drawbacks of using videotape to obtain traffic data has been that the data have to ultimately be extracted manually. This study investigated the feasibility of automatic data extraction using a "breadboard" version of SCAN designed especially to deal with this problem. Software development is under way and field tests are being performed with the breadboard installed in a step-van.

46. Sumner, R., Baguley, C. (1978). Close following behaviour at two sites on rural two lane motorways in England. Crowthorne, Berkshire, England: Transport and Road Research Lab, Road User Characteristics Division.

Videotape equipment was used to monitor 7,325 vehicles to study close-following behavior on rural, two-lane roads in

England. Periods of both maximum and minimum traffic flow were studied. It was found that 31% of drivers were following the vehicle ahead with a gap of less than two seconds. Also, heavy-goods vehicles were found to follow more closely than lighter vehicles.

47. Troutbeck, R.J. (1984). Overtaking behaviour on narrow two-lane two way rural roads. South Victoria, Australia: Australian Road Research Board.

This study to determine the effect of road width on overtaking behavior on rural roads in Australia employed an experimental data collection technique. Digital information was superimposed on a video signal and videotape was used to record the behavior and surroundings.

48. Wasielewski,P., (1981). The effect of car size on headways in freely flowing freeway traffic. Transportation Science, 15 (4), 364-378.

Data were obtained using a videotape recorder system to determine the effect of car size on freeway capacity. Vehicle arrival times of oncoming traffic were measured from the videotape using a photodetector mounted on the monitor screen. Size classifications were made by an observer from the pictures of each vehicle pictured on the monitor. Results show that average headways increased monotonically with lead car size. The study also determined that freeway capacity could be increased 8% if all cars were replaced with small (subcompact) cars.

49. Wennell, J., Cooper, D.F. (1981). Vehicle and driver effects on junction gap acceptance. Traffic Engineering and Control, 22 (12), 628-632.

Driver gap acceptance was observed at four non-urban t-junctions employing a video camera and a microprocessor. Empirical relationships between gap acceptance and the time taken to complete turns were derived for cars. Along with the videotape, a conflict simulation model was used to determine accident risk.

50. Woodman, W.F. (1982). Computer-controlled videotape display: an innovation in traffic analysis. (Transportation Research Record No. 841, 47-50.) Washington, D. C.: Transportation Research Board.

Although videotechnology has been available to traffic researchers for over a decade, its uses have generally been limited to routine applications. Recent developments in microcomputers and interface equipment have facilitated the use of videotape in research. This report details work contracted to the Iowa Department of Transportation in which computer-videotape simulations of uncontrolled intersections were

presented to a group of respondents. Data are presented to demonstrate the effectiveness of the videotape-computer research approach.

51. Wooton, H.J., Potter, R.J. (1981). Video recorders, microcomputers and new survey techniques. Traffic Engineering and Control, 22 (4), 213.

A system comprised of video cameras and recorders for observing traffic movements and recording data, "VISTA" for short, is described in this article. This equipment has been used to monitor congestion and is useful for studying the merging operation of signalized junctions.

IV. TRAINING

Recent research findings show that the use of the television screen aids the learning process by enhancing recall ability. Videotape has been used primarily to teach traffic safety to young children and to instruct state employees in the proper use and maintenance of equipment.

52. Cawkell, E.M. (1982). Using videotape recording for traffic education in schools. Traffic Education, 7 (3), 8-9.

53. Cyster, R. (1980). The use of video recording in traffic education in primary schools. Traffic Education, 5 (2), 5-6.

54. Dueker, R.L. (1981). Experimental field test of proposed anti-dart-out training programs, volume 1: conduct and results. Valencia, Pennsylvania: Applied Science Associates.

55. Dueker, R.L., Berger, S.S. (1981). Experimental field test of proposed anti-dart-out training programs, volume 2: implementation guidelines and program materials. Valencia, Pennsylvania: Applied Science Associates.

56. Deuker, R.L., Berger, S.S. (1981). Experimental field test of proposed anti-dart-out training programs, volume 3: program staff training materials and videotape/film. Valencia, Pennsylvania: Applied Science Associates.

57. Rothengatter, J.A. (1981). The influence of instructional variables on the effectiveness of traffic education. Accident Analysis and Prevention, 13 (3), 241-253.

58. Rothengatter, T., Dijkstra, G., Ruyter, L. de. Comparison of the Effects of Videotaped Traffic Safety Messages for Preschool Children. Haren, Netherlands: Netherlands Traffic Research Center.

59. Vanmonds, G.R., Kerkof, J.H., Jong S.A.M. (1983). Training observers to follow children and score their road crossing behavior. Ergonomics, 26 (6), 535-553.

Videotape is used as an instructional tool to teach safety to children. This method has been found to be very effective with primary and grade school children. Observers who evaluate children's safety behavior are also trained using videotape.

60. Goldman. Test film analysis and video tape retrieval library. Washington, D. C.: Native American Consultants.

This project involves the consolidation and conversion to videotape of the existing FHWA film library. In addition, a videotape viewing and editing laboratory is to be developed, and a catalog of test films and records will be entered into a searchable database.

61. Pederson, C. M. (1983). Video tape: a research implementation and training tool. Oklahoma City: Oklahoma Department of Transportation.

This report discusses and explores the possible uses of videotape for training and information dissemination in the Oklahoma Department of Transportation. The report is presented both in written form and on videotape.

62. Synder, G. L. (1983). Driver training: how, what, and why. Fleet Owner, 78 (6), 80-83.

This article details the program one trucking firm uses to train drivers who haul hazardous materials. The videotape program illustrates correct procedures for loading and unloading and for coping with emergencies.

63. Wilson, S. D., Kelsen M. K. Foundation Instrumentation/ Inclinometer. Seattle: Shannon and Wilson, Inc.

A 45-minute videotape and accompanying manual on the inclinometer was prepared for highway engineers. This videotape and manual show how the inclinometer can be used to monitor the stability of slopes.

V. VIDEOLOG

Recent technological advances in videotape have rendered it less expensive than film with little difference in resolution. In many state transportation agencies, videotape is now being used to replace old film photologs. Videologs, as they are called, can contain the same types of data and can be transferred to video laser disc. A video laser disc interfaced with a computer makes information access faster, simpler, and more efficient than the old photolog method.

64. Hudson, John H. and Sime, James M. (1986). Procedure manual for photolog laser videodisc production (Pavement Management in Connecticut, Phase II- Development, Part 2-- Visual Rating of Pavement from Photolog Inventory, Report No. 887-6-86-1). Connecticut Department of Transportation, Division of Research.

    This is one in a series of reports written by the Connecticut Department of Transportation in conjunction with the evaluation of converting its existing photolog to laser videodisc.

65. Kloak, G. E. and McDough, J. J. (1978). Video-logged computerized traffic sign inventory. Transportation Engineering, 48 (4), 29-34.

    A system that uses videologging and a computerized inventory for quickly identifying and locating signs is described.

66. Ross, B. (1983). Mobile inventory system. Alberta Transportation Magazine, 6 (2), 3-6.

    A Mobile Highway Inventory System (MHIS) has been developed by Alberta Transportation. This system employs a videocamera mounted in a van to record the highway. An on-board microcomputer catalogues the exact location of signs, bridges, and intersections using the digital-based TENN-11 highway inventory program.

APPENDICES

Appendix A presents the reader with a breakdown of the responses received on the videotechnology questionnaire which was mailed to transportation departments in the 50 states and the District of Columbia. Completed questionnaires were received from 42 agencies. Appendices B, C and D contain examples of catalogs of videotape presentations available at the federal and state level.

APPENDIX A

VIDEOTECHNOLOGY QUESTIONNAIRE

VIDEOTECHNOLOGY QUESTIONNAIRE

1. To what extent does your agency use videotape in its operations?
   (a) 25 frequently (b) 13 on occasion (c) 4 plan to (d) 0 not at all
   (If "not at all," please return unanswered questionnaire.)

2. Please check your agency's uses for videotape. (If there are others, please list.)
   (a) 39 Training
   (b) 20 Research documentation
   (c) 23 Recording construction
   (d) 7 Troubleshooting
   (e) 18 Traffic surveillance
   (f) 17 Television programs/ads
   (g) 1 Video teleconferencing
   (h) 17 Recording meetings
   (i) 20 Dissemination of info to field offices
   (j) 16 Employee communication/personnel
   (k) 10 Videologging
   (l) 6 Traffic counting
   (m) 8 Testing new equipment
   (n) 23 Documentation of field activities
   (o) 15 Maintaining historical information
   (p) ___ Other (specify)_____

3. For each of the items you checked in the previous question, please briefly describe how videotape is used. (Use the back of this sheet if more space is needed.)
   Item
   ( ) See specific state write up.
   ( )
   ( )
   ( )

4. Do you produce your own videotapes, use prerecorded tapes, or both?
   3 Produce Tapes 5 Use prerecorded tapes 33 both

5. If you produce videotapes, please describe how they are used by your agency. (Use back of sheet if necessary.)
   See specific state write up.

6. (a) Do you maintain a videotape library? 27 yes 14 no
   (b) If yes, how many tapes does it contain? 0-7,200 tapes

7. We are especially interested in your knowledge and use of videologging. Do you use or plan to use a videologging system? 9 use 9 plan to use

8. If you use videologging, please check the items that you log.
   (a) 4 Longitudinal distance
   (b) 7 Sign inventory
   (c) 6 Roadside development
   (d) 4 Rating surface texture
   (e) 5 Pavement rating
   (f) ___ Other (specify)_____

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9. Please indicate the types of roads you videolog and the number of miles logged for each type.

Type	Total Routes Videologged	Total Miles
(Example) Interstate System	3	2,900
(a) See specific state write up.		
(b)		
(c)		

10. How long have you used videologging? ____ year(s) ____ months (4 yrs. to starting)

11. We would like to know something about the manpower necessary to perform your video operations. Please give job titles, description, and man-hours allotted to video work. (Use back of page if necessary.)

Job Title	Description	Man-hours/Month
(Example) Camera Operator	Operates camera in field	12 hr.
(a) See specific state write up.		
(b)		
(c)		

12. Approximately how much do you have invested in video equipment? $ 0-$200,000
(Of 42 states responding, the state average was $45,892.)

13. Please list the major components you have. Include brand name and any model numbers. (Use back or separate sheet if necessary.)
See specific state write up.

14. (a) Do you plan to purchase additional equipment? 28 yes 14 no
(b) If yes, what items? See specific state write up. Equipment tended to be the addition of more advanced equipment, including editing systems.

Please fill in this information about yourself.

Name:_____ Title: _____
Department:_____ Telephone: _____

Do you have a videotape that exemplifies the uses your agency makes of videotape that you would be willing to send us a copy of? If so, please send it to the address below.

Thank you very much for your time. Please give below any additional information, comments, suggestions, etc., you have regarding the use of videotape.

Thank you very much. Please return to:

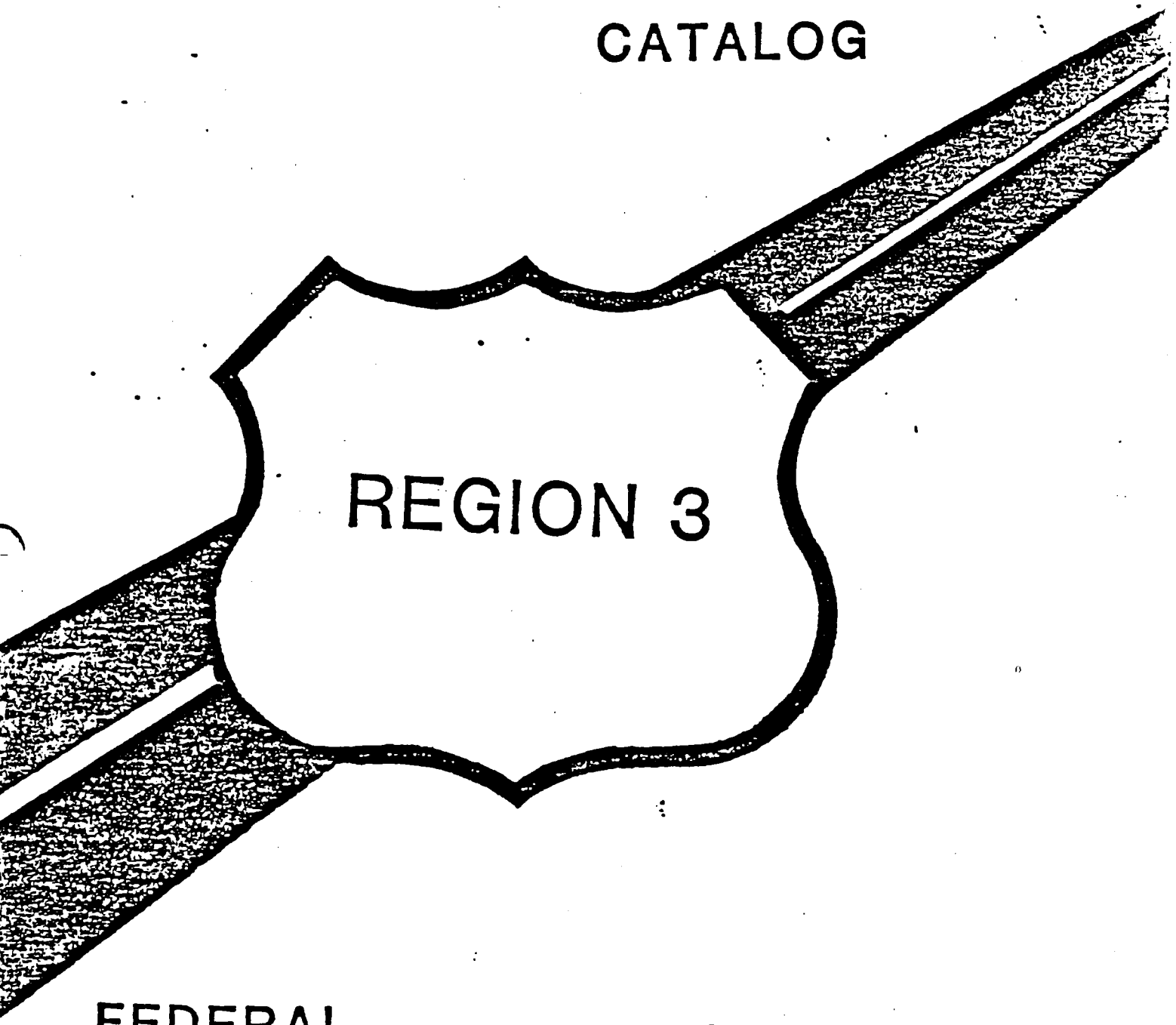
Mike Perfater, Research Scientist
Box 3817 University Station
Charlottesville, VA 22903-0817

APPENDIX B

FEDERAL HIGHWAY ADMINISTRATION

Audiovisual Catalog

AUDIOVISUAL CATALOG



FEDERAL HIGHWAY ADMINISTRATION

OCTOBER 1985

1272

INSTRUCTIONS FOR USING THE AUDIOVISUAL CATALOG

The Catalog contains slides, films and videotapes that are maintained in the Regional Office as part of the Technology Transfer Program.

The system can be best utilized by first locating the page number of the desired subject area, on page 1. Then by turning to the subject page, the specific audiovisual item can be located. The description for each specific item is listed in numerical sequence:

S - (Slides)
F - (Films)
VT - (Videotapes)

TABLE OF CONTENTS

The items contained can be obtained by contacting:

Federal Highway Administration
31 Hopkins Plaza, Room 1614
Baltimore, Maryland 21201
ATTN: Mr. John Webster
Tel.: 962-2542 FTS: 8-922-2542
Or through any FHWA Division Office

VIDEO TAPES

VT-1 Regions 4 and 6 Construction and Materials Conference
2 hours, b&w

Four tapes, each 30 minutes, deal with producer control of highway construction and materials. Discusses producer control of aggregates, portland cement concrete construction and asphaltic concrete. (May 13-14, 1975)

VT-3 Internally Sealed Concrete
19 min., b&w, 1976, 2 copies

Tape produced by the Oklahoma Highway Department explains the principles of internally sealed concrete (wax beads). The tape shows both the placing of wax bead concrete and the electric blanket heating process.

VT-4 Design of Embankments On Soft Foundations
P.I color, 1977 P.II color, 1977

The tapes are based on HPR studies conducted at MIT. Part I lasting 30 min. discusses geotechnical engineering design and methods of predicting embankment performance. Part II runs 50 min., discusses the International Prediction Symposium held at MIT in 1974. Should be of interest to soil engineers.

VT-5 Portland Cement Concrete Field Sampling and Testing
27 min., 1977 (To be shown W/F-33)

Videotape illustrates techniques described by AASHTO in the field of sampling and testing of PCC. Tests are those used by Utah DOT and include air, slump, yield, casting of cylinders and beams, Kelly ball and Chace indicator.

VT-6 FHWA by PA. DOT Workshop, Lancaster, Pa.
Approx. 3½ hours - 3 tapes, 1976

First afternoon session of the Region 3 Ninth Annual Quality Assurance Workshop held in Lancaster, Pennsylvania on February 17-19, 1976 made by the Washington Office.

VT-7 Concrete Pavement Rehabilitation by Georgia Department of Highways
3 - part videotape, 1½ hours, 1977

A 3-part tape presentation illustrating Georgia's rehabilitation work on I-75 south of Macon, Georgia.

VT-8 Presentation on Two-Course Bridge Deck Construction Technology
20 min., color, 1976

The tape focuses attention on two of their methods for bridge overlay systems - the DOW and the Iowa System.

VT-9 A) Internally Sealed Concrete/
B) Two-Course Concrete
(A-19 min., b&w, 1976, 2cc) (B-20 min., color, 1976)

A) Tape produced by the Oklahoma Highway Department explains the principles of internally sealed concrete (wax beads). The tape shows both the placing of wax bead concrete and the electric blanket heating process.

B) Presentation prepared by the Oklahoma Highway Department depicts Oklahoma practice for bridge deck overlays utilizing the DOW and Iowa Systems.

VT-10 A) Shoulder Treatment/
B) Solar Heated Asphalt Storage
(A-15 min., color, April 1979) (B-15 min., color, April 1979)

A) Describes spraying of shoulders to control bermuda grass damages. Course calibration, mixing, spraying, safety and reporting.

B) Describes design and construction of solar heated asphalt storage tank for emulsion.

VT-11 A) Speech on Energy/
B) Hand Patching (Asphalt)
(A-15 min., color, April 1979) (B-17 min, color April 1979)

A) Copy of political speech on energy. Sent out for information.

B) Oklahoma DOT videotape used as training devices for maintenance crews involved with potholde patching. Inspection, planning, and pavement repair procedures are shown.

VT-31 Highway Statistics: A Congressional Overview
27 min., b&w, July 1977

A brief discussion on how the Senate Public Works Committee uses data received from the Federal Highway Administration as planning tools to determine results of legislation and program effectiveness. (Technical)

VT-32 Traveler Response to Transportation System Changes
27 min., color, 1977

This videotape is an overview of the 10 categories of transportation system change in detail. These are designed to conform to the TSM actions and are the following:

pool/bus priority facilitiles
buspools/vanpools
carpool encouragement activities
bus routing coverage
transit fare changes
transit scheduling and frequency
transit marketing and amenities
variable work hours
area auto restraint
auto facility pricing

The tape is not recommended for general viewing; only technical personnel who are directly involved.

VT-33 People and the Land -- Community Involvement
27 min., b&w, 1974

The videotape illustrates a community involvement technique used by the Oregon Land Conservation and Development Commission (LCDC) during a series of public workshops. As part of an effort to fulfill a new legislative mandate, 56 public workshops were conducted throughout the State of Oregon in the spring and fall of 1974. These workshops assisted the LCDC in determining citizen attitudes and concerns about land use and comprehensive planning.

VT-35 Truck Size and Weight Relationships to Pavement and Bridge Design
32 min., color, July 1979

A non-technical chart-talk presentation on the relationship between truck loading, pavement design, and bridge design.

VT-36 Vanpooling
7½ min., color (cassetts & open reel)

The videotape explains what vanpooling is, the passenger advantages, driver benefits, general benefits, how to start a vanpool, and information on financing and insurance of vanpools.

-1276

VT-51 Safety Considerations in the Design of Highway Drainage - "FAC"
Presentation #I - Drainage Features

Drainage conflicts with guardrail, bridge railings, and median barriers, safe inlet and outlet structures, use of closed drainage systems for safety and hazard of pavement flooding and preventive measures.

VT-52 Delineation Conference Summary
(Two Tapes) P.I - Delineation Material P.II Traffic Operations

Summary presentation of delineation conferences. The tapes contain highlights on (1) traffic operations and (2) material aspects as presented at these conferences.

VT-53 Issues and Problems in Community Involvement
23 min., b&w

Videotape highlights on the issues and problems identified and discussed during the 1975 NHI courses "Community Involvement in Highway Planning and Design" by Toner and Associates. Portions of the course are shown with summaries and views by the consultant.

VT-54 Elements of a Community Involvement Program
25 min., b&w

Videotape highlights on the elements and techniques in developing and conducting a community involvement program for a transportation proposal. Portions of the 1975 NHI courses conducted by Toner and Associates.

VT-71 Emergency Operations Simulation
22:40 min., b&w, 1977

The tape describes the FHMA Emergency Operations Simulation (EOS) Program. The EOS is a practical emergency practice exercise for State Highway Agencies.

VT-72 President Carter's Visit to DOT
20 min., color, 1977

Secretary Brock Adams introduces President Carter to employees of the Department of Transportation during the week of February 1977 in Washington, D.C.

VT-73 New Directives Distribution
34:36 min., color, 1977

FHWA Order 1300.1, dated February 3, 1977, establishes a new distribution system and transmits a Distribution System Handbook containing policies, responsibilities and procedures. The videotape describes the system and provides instruction for documenting copy requirements. It is intended for use by Regional and Division Administrators in introducing the new distribution system to their personnel. The new distribution system became effective May 1, 1977.

VT-76 FHWA-NHI "Intergovernmental Management" - "The Task Ahead"
30 min., color, 1976

Tape designed to stimulate interest in actions proposed in Office of Management and Budget Report, "Strengthening Public Management in the Intergovernmental System."

VT-77 FHWA Emergency Preparedness Program
45 min., color, Oct. 1979

The purpose of the videotape is to provide a vehicle which will acquaint the FHWA Headquarters, region, division, and State Highway organization key personnel having emergency assignments with the overall FHWA EP Program.

VT-78 Community Involvement - Highlights from a Recorded Interview
37 min., 1975

Recorded highlights from a recent interview with Lowell Bridwell and Walter Arensberg on the subject of community involvement. Experience of West Side Highway project in New York City is discussed.

VT-79 Rope Wick
Narrative for VT, 1980

Videotape produced by Oklahoma DOT in collaboration with Oklahoma State University which shows the effectiveness of Roundup herbicide used with the Rope Wick Applicator in controlling Johnson Grass and other undesirable weeds on the highway right-of-way.

1978

VT-80 Save That Road
PI 20:23 min., PII 22:23 min., 1979

PI - Machine patching, cut out failures 20:23 min.
PII - Surface Restoration 22:23 min.

Videotape on surface maintenance procedures produced by the Oklahoma DOT. Tapes are intended for use in training maintenance crews on two selected types of surface repairs.

VT-81 Building on the Past
27:45 min., 1978

Archeological Salvage in connection with Interstate 270 in Illinois.

VT-82 Messrs. Hassell & Lamm Presentation
P.I - 27:03 min., color P.II 24:32 min., color
July 24, 1980

Presents comments by Messrs. Hassell and Lamm concerning FHWA program emphasis areas, administrative management issues, and other items of general interest to FHWA officials and employees.

VT-83 DOT Communicates
24 min., color, 1980

Videotape prepared for the DOT Communications Campaign "Between Hello and Goodbye" (telephone answering and "Gobbledygook" (letter writing) is featured for all DOT employees.

VT-84 The 1980's: Decisionmaking on Major Urban Projects
32:28 min., color, 1980

Videotape presentation on DOT's Urban Policy for the 1980's. Messrs. Wright, Hassell and Lutz cover planning development and communication, energy conservation and environmental policy, and interstate funding transfers and minority business goals.

VT-85 FHRS Groundbreaking Open House
26 min., color, 1980

Videotape made during the 1980 groundbreaking ceremonies at the FHWA Fairbank Highway Research Station. This videotape is designed to bring you information about the kinds of research being done at Fairbank.

VT-86 Energy Conservation: FHWA's Role
20:05 minutes, color, 1980

Videotape featuring Less Lamm, Executive Director of FHWA: Dean Calson, Deputy Administrator for R-4 and Vic Taylor, Division Administrator in New York. The topic for discussion is the role of the FHWA in energy conservation.

VT-87 10th Annual Awards: Interpretation of Entry Form
5 minutes, color, 1977

Videotape shows and explains the size, number and kind of photographs required for each of the entrees in the subject awards plus the types of projects that can qualify as an awards entry.

VT-88 I-66 from Helocopter (495 to D.C.) (Under Construction spring of 1979 32 min., color

I-495 to D.C., spring of 1979; I-495 to D.C. and return to I-495 early summer 1979: Dick Butler, VDH&T location engineer narrator, produced by Bill Lattin, R/3.

VT-89 I-476 "Blue Route" Region 3
18 minutes, color

The videotape is the first Region 3 production of a videotape from a helicopter showing a proposed highway corridor and three alternative alignments near an environmentally sensitive area (a community reservoir). The alternatives are shown by means of video-integrated graphics by which flight over the alternative alignments was simulated in the studio by means of the "zoom technique". Also used were "through-the-windshield" video scenes of built highways having characteristics similar to the proposed alternatives shown by means of the video taken graphics.

VT-90 Bridge Gross Weight Formula
19 minutes, color 1981

Videotape narrated by John Hibbs which provides an exploration of the Federal Bridge formula as it applies to the Truck Size and Weight Program.

VT-91 Edens Rehabilitation 1978-1980 Illinois Department of Transportation
30 minutes, color

The half-inch tape takes approximately 30 minutes to view and highlight such items as pre-construction planning, recycling, maintenance of traffic safety, and other essential elements of reconstruction work. The tape should be very informative for all highway personnel.

VT-92 Highway Backer Rod Use in Sealing Pavement Joints
15 minutes (1 reel-to-reel), 1 cassette, color

The videotape was made by Hercules Incorporated to explain in basic terms the mechanics and design of concrete pavement joints, its purpose, its construction and its seal.

VT-93 Geotechnical Engineering:

TS-77-219 "Foundation Instrumental/Inclinometer"

TS-77-219 Color, 44:34 min., copy

TS-77-209 "Dutch Cone Pentration Test"

TS-77-209 Color 12 min., 3 tapes

TS-78-210 "Negative Skin friction"

TS-78-210 Color part I 32 min., Part II 25 min.

Foundation Instrumentation/Inclinometer (TS-77-219): The inclinometer is an instrument for monitoring the lateral deformation of embankments and structures during construction. This instrument also is a useful device for analyzing and understanding landslide movements. The videotape will aquaint highway engineers with the application of the inclinometer to situation where lateral deformation must be controlled such as slope and embankment construction, sheet piling, etc.

This videotape describes the development of the instrument, its field use and installation, and interpretation of the field data.

Dutch Cone Penetrometer (TS-77-209): The Dutch Cone Penetrometer is a device which can be an effective tool in a soil exploration program with such specific uses as determining in-site soil shear strength, pile design parameters, etc. This device has been popularly used in Europe to obtain subsurface information for several years, but has only recently been introduced in the United States. The results are used by designers to more economically design foundation support needed for roadways and bridges.

Negative Skin friction (TS-78-210): The settlement of soil surrounding pile foundations causes negative friction to develop between soil and pile. If not considered in the design, the resulting downdrag force can cause excessive pile settlement or other serious pile distress which can result in unsatisfactory structure performance (E.G., settlement of bridge abutments and piers). MIT has investigated negative skin friction for a number of years and has developed procedures for estimating the magnitude of pile downdrag and methods of reducing the problem. This 2-part videotape presentation summarizes both the research and the results of an MIT Symposium conducted in conjunction with the research. In this videotape program, Dr. Lambe first describes the philosophy of his prediction technique and then discusses the mechanics of negative friction and the method of analysis and correction. Lastly, he presents a summary of the results of the symposuim.

VT-94 Video Tape, A Research Implementation and Training Tool

1 Booklet, ½ inch reel-to-reel tape, ½ inch VHS tape
July 15, 1983

This video tape and report clearly and dramatically show the uses and power of video tape for documentation of research, technology transfer and training.

VT-95 Corridor Management Strategies Applied to Reconstruction: The Case of I-376 in Pittsburgh

1 video tape cassette, 1 reel-to-reel, 18 minutes
August 24, 1983

The materials describe the planning, developement, operation and cost effectiveness of the following TSM strategies: A third-party vanpool program preferential treatment for high occupancy vehicles (HOV's), arterial signal improvements, park-and-ride lots, and also express bus service and commuter rail service

VT-96 Agricultural Access Network Pilot Study

A video tape describing the Pennsylvania Department of Transportation's 1984 experience in identifying those roads most important to the transportation of agricultural commidities in two counties. The information gathered enables the state to determine which roads and bridge improvement projects will provide the greatest benefits economically to the agricultural and rural communities.

VT-97 Pavement Division - FHWA

This videotape describes the activities of the Pavement Division of the Federal Highway Administration. It gives a brief overview of most of the topics currently being investigated in the pavement field. It also gives a quick summary of the state-of-the-art. It should be noted that the organization of the division has been restructured since this videotape was produced.

VT-98 Erosion and Sedimentation Control For Highway Construction

This fifteen minute videotape deals with ways to combat erosion

VT-98 (Continued)

and sedimentation along roadways. It gives reasons why this should be done and some are: irretrievable loss of soil, flooding, loss of industries and destruction of fish and their habitats. The tape was produced by the Pennsylvania DOT.

VT-99 Using TRIS: The Transportation Network

This videotape goes into great detail explaining the TRIS network and how it works. TRIS is a computer based network with over 185,000 sources of ongoing research material. It is available in the United States and Canada. The videotape shows how TRIS can make projects dealing with transportation easier and more indepth. Several people who have used TRIS give their opinions and their experiences using the network.

VT-100 Oklahoma DOT - Video Research and Training Applications for Television

Videotape goes into great detail to explain the expansive video recording program used by the Oklahoma DOT. It tells how video-tape can be used to show research findings and how the findings are put on put on videotape to send out to those who need them most. It gives point by point instruction on how to start a program similar to this one and how it could benefit you. Many of the video tapes produced through this program in Oklahoma are used throughout the FHWA network. A very informative video.

VT-101 Better Bridge Decks
27 min., 1985

Maryland State Highway Administration for use in training inspection personnel assigned to bridge deck construction projects. The video describes the inspection of bridge deck construction as a 6-step program throughout which the inspector plays a prime role in assuring proper construction. The program begins with preparatory phase (review of sports, etc.) and ends with careful inspection of the curing techniques. It will be of interest to bridge designers, construction engineers, inspectors and construction management personnel. This video is also available on film (F-39).

APPENDIX C

IDAHO TRANSPORTATION DEPARTMENT

1985-1986 A/V Video Catalog

GENERAL INFORMATION

While the contributors to this resource catalog have been most generous in providing listings of what they have in their libraries, there are a few ground rules:

1. Many programs are copyrighted and have been paid for by the various DOTs. Therefore, the state would be very reluctant to loan out these tapes or programs.

2. If programs from other states are ordered in quantiy, the borrower should utilize UPS COLLECT shipping and pay shipping charges when returning the material. If you don't already have a UPS account number, contact them for information.

   UPS naturally does not use P.O. Box Numbers. Use a DOT street address instead.

3. To save shipping expenses, book rate is more economical.

4. In instances where states have obtained programs from FHWA, TRB, or similar sources, it would be best to order directly from those sources rhat then inundate the individual states with requests.

5. We did not list all of the telephone numbers of individual contacts, but this information is available from the AASHTO 1985 Reference Book of member Department personnel and committees.

6. If you have any comments with regard improving this resource catalog, or better methods of exchanging programs among the states, they would be greatly appreciated.

7. When more returns come in from states who have not responded, we will send you an addendum to add to your catalog. I would note that several states have no AV production facilities or programs at the present time.

Alabama Highway Department
1409 Coliseum Blvd.
Montgomery, AL 36130

Contact: Maintenance Bureau
Tom L. Cain (205) 261-6272

Course Number	Course Title
1	Asphalt Surface Care
2	Spot Premix Patching
3	Major Premix Patching
4	Sealing Asphalt Surfaces
5	Mowing
6	Drainage Maintenance
7	Ditching
8	Shoulder Maintenance
9	Minor Bridge Maintenance
10	Work Area Safety
11	Maintenance Need & Condition Reportin
12	Correcting Hazardous Conditions
13	Accident & Hazardous Debris Control

CONNDot
2710 Berlin Turnpike
Newington, CT 06111

Contact: Joseph Kanachovski
Training Coordinator

Title: Handling Hazardous Materials - Transportation Emergencies
Format: Slide/tape
Description: 130 slides with sync tape describing Hazardous Materials emergencies that CONNDot personnel may be called to and the policies that personnel are permitted to be involved in.
Time: 30 min.

Title: Flagging
Format: Slide/tape/demonstration/discussion
Description: 85 slides with sync tape describing flagging procedures, illustrating common situations and the proper way to handle them, including maintaining a good public image.
Time: 30 min. for tape, demo-discussion as necessary.

Title: Truck Driver Training
Format: Slide/tape, demo, discussions, hands-on training.
Description: The program is divided into two halves. A classroom portion consisting of 239 slides covering such topics as accident procedures, backing, defensive driving, parking, plow and sandspreader hook-ups, and winter driving are presented. Demonstrations covering preventative maintenance and discussions follow. The other half of the program is given on a one-to-one basis between Department Driver Trainers and each employee.
Time: Classroom portion: 4 hours. Hands-on training varies with the skill of the individual employee.

Delaware DOT
P.O. Box 778
Dover, Delaware 19903

Contact: Paul Welsh,
Manager-Community Relations
(302) 736-4313

The following listing of audio-visual material is currently available and in use within DelDOT. Copyright conditions are listed.

1. Video tapes for equipment operators:

a. Overview of training program
b. Motorgrader
c. Dump truck
d. Gradall
e. Backhoe
f. Loader
g. Snow plow/salt spreader
h. Mowers
i. Crack sealer
j. Pothole patcher
k. Pneumatic roller
l. Steel wheel roller
m. Trailer
n. Athey loader
o. Bulldozer
p. Brush cutter
q. Pulvi-mixer
r. Wrecker
s. Lowboy
t. Preparation for winter operations
u. Drainage pipe installation
v. Work zone control flagging
w. Backing safety
x. Low volume road maintenance

Tapes (a) through (s) are owned by DelDOT and can be shared. Tapes (t) through (x) were purchased from others and copyright privileges are not clear.

2. Videotapes for Technicians:

a. Certification of Concrete Field Testing Technicians I.
b. IBC MK VII Barrier Maintenance.

These tapes were purchased from others and copyright privileges are not clear.

3. Slide/tapes for Technicians:

a. Bridge Inspection.
b. Minor concrete structures Inspection.

These tapes were purchased from Roy Jorgensen Associates - copyright privileges are unclear.

Idaho Transportation Department
P.O. Box 7129
Boise, ID 83707

Contact: Bill Harvey
Training & Development
(208) 334-4057

The following programs can be loaned in either 3/4" or 1/2" VHS

The ABC's of Diesel Engines	26 min.
Agricultural Chemical Emergencies	40 min.
Anatomy of a Road	30 min.
Are You Convinced?	10 min.
Building On The Past	28 min.
Business of Backhoe Loader Operations	20 min.
Closed Containers & Fires	18 min.
Crash Cushions (Barrels)	20 min.
CALTRANS (Long truck demo)	15 min.
Crashes Need Not Kill	28 min.
Danger Zone - Your Back	18 min.
Employee Orientation (MnDOT)	15 min.
Employee Orientation (Idaho)	12 min.
Employee Orientation (PennDOT)	15 min.
The Ears & Hearing	21 min.
Electrical Lockout Problems	15 min.
Everything Rides On The Roads	28 min.
Evolution of a Highway	27 min.
Forgiving Highways	15 min.

GMC Fiberglas Plastic Repair & Refinishing - 35mm slide/sound. Step-by-step repair of fiberglas used in making 4 & 6-ton dump truck cabs. General Motors Corp.

Continuous Concrete Pavement Patching - 35mm slide/sound/script. How To on continous concrete pavement patching.

Jointed Concrete Pavement Patching - 35mm slide/sound/script. How To on jointed concrete pavement patching.

Iowa DOT
Public Transit Division
5268 N.W. 2nd Ave.
Des Moines, Iowa 50313

Contact: Candace A. Bakke,
Director

Videocassettes

VC-01 Transit Potpourri - 32 min. color, 10 short subjects about transit, including interurbans, carpools, vehicle types, dial-a-ride and commuter buses.

VC-03 Just One of Those Things - 30 min. color, narrated by Rod Serling. How the future of transportation in the cities was envisioned in the 40's and what really happened.

VC-04 Double-Up - 25 min. color. U.S. D.O.T. production about carpooling.

VC-09 Koumalia - 5 min. color. Czeckoslovakian cartoon. Lead character attempts to escape city congestion and pollution, locates on an island believed to be desterted but finds the same problems.

VC-10 Goin' Into Town Feelin' Fine - 28 min. color. U.S. D.O.T. production describing transportation alternatives including park-and-ride in Seattle, why people drive in Los Angeles, exclusive bus lanes in Oakland, California, and the Shirley Highway in Washington, D.C.

VC-13 Innovations in Mass Transit - 20 min. U.S. D.O.T. program illustrating ideas on how to improve transit in urban areas

VC-16 Transit Options For Small Communities - 25 min. color. U.S. D.O.T. production featuring several small urban areas and their particular types of transit systems.

1299

Department of Public Works
and Highways
John O. Morton Bldg.
Hazen Drive
Concord, New Hampshire 03301

Contact: Pete Morrison,
Informational Representative

Operation Clean Sweep - 16 min. video. Highlights the Department's award-winning roadside litter cleanup effort. Produced in-house. Available on 3/4" or 1/2".VHS.

Nebraska Department of Roads
Box 84759
Lincoln, Nebraska 68509-4759

Contact: Blaine Osterman,
Training Officer

Videotapes Available Now

Preventative Maintenance:		*-An Overview*
Trucks:	*Part One*	*-Pre-Trip Inspections* *-Start-Up Procedures* *-Transmissions*
	Part Two	*-Basic Maneuvering* *-Dump Box Operations* *-Shut Down*
Loaders:	*Part One*	*-Pre-Trip Inspections* *-Start-Up Procedures* *-Loader Controls* *-Shut Down*
	Part Two	*-Maneuvering* *-Operations*
Tilt Bed Trailers:	*Part One*	*-Pre-Trip Inspection* *-Hooking Up* *-Loading the Trailer*
	Part Two	*-Towing & Basic Maneuveri* *-Unloading* *-Loading Materials*

Rotary Mower:	Part One	-Pre-Trip Inspection, Tractor & Mower
	Part Two	-Basic Operation
Motorgrader:	Part One	-Basic Information & PM -Start-Up -Shut Down
	Part Two	-Positioning the Blade
	Part Three	-Operating Techniques
	Part Four	-Blading Unpaved Roads

Video Programs To Be Produced:

Trucks - Snow Removal Operations
Motorgrader - V Plow Snow Removal

Oklahoma DOT
200 N.E. 21st St.
Oklahoma City, OK 73105

Contact: Ray Mayfield
Training Division, Branch Manager

Videotape Programs

Hand Patching - Don't Come Back	C-3
Willow Control	C-4
Shoulder Treatment - It's Up To You	C-5
Save That Road (Part I)	C-6
Save That Road (Part II)	C-7
Man That Spray Rig	C-8
Chemical Control - Keep The Right-of-Way	C-9
Johnsongrass	C-10
Water Emulsified Soil Asphalt	C-13
John Deere Articulated Motor Grader	C-14
Asphalt Armorcoating	C-15
Bridge Deck Hanger Technique	C-20
Shadows of the Road	C-22

AASHTO Materials Sampling & Testing Series
T-23
T-27
T-88
T-90
T-99
T-119
T-141
T-152
T-164

Pennsylvania DOT
Transportation & Safety Bldg.
Commonwealth & Forster Streets
Harrisburg, Pennsylvania 17120

Contact: ~~Simone Adamsky~~ ~~Press Secretaries Office~~ BOB STOLL Chief. Training Div. (717-787-4125)

A/V#	Title	Description
00000	Guide for Select'g/Deign'g/Locat/g Traf Barriers	AV 175-182
00000	Safety for Supervisors (See A/V 144,145,146)	
00000	TRB Annual Meeting 1985 Session Tapes	See 00213-11228
00001	Layalsock Creek Film	PA DOT Res Proj80-3
00002	Illegal Cutting of Vegetation on Highway R/W	27min/1979/film
00004	I Just Work Here	20min/1965/filmb&w
00005	Time of Your Life-Time Management	28min/1977/film
00006	Truly Exceptional-Carol Johnson Overcomes Handicap	16min/1979/film
00007	Managing Stress	35min/1976/film
00008	Where are You? Where Are You Going?(Goals)	24min/1976/film
00009	Modern Motor Grader Operation	24min/1981/vidcas
00010	Modern Motor Grader Operation Made Better	7min/1981/vidcas
00011	Critical Path	28min/1967/filmb&w
00012	Power of Listening	25min/1979/film
00013	Good Start-Meeting Leader's Guide	19min/1979/film
00014	Firm But Fair	17min/1979/film
00015	Supervisor's Role in Increasing Productivity	22min/1978/film
00016	Marketing The New Mass Transit	1980/text/1 cass.
00017	New Way To Lift	10min/1980/film
00018	It Always Happens To The Other Guy	22min/1981/film
00019	Shake Hands With Danger	22min/1979/film
00020	Such A Beautiful Day-Drinking & Driving	15min/1975/film
00021	So Long Pal-Drinking & Driving	22min/1975/film
00022	Traffic Safety & Children	15min/1974/film
00023	On Two Wheels	29min/1978/film
00024	Where Have All The People Gone? (Seat Belts)	30min/1974/film
00025	Until I Get Caught-Drinking & Driving	20min/1980/film
00026	Buckle Up Baby	11min/1979/film
00027	Everday Gamble-Safety Film	
00028	You May Not Get A Second Chance (Split Tire Rims)	30min/1980/vidcas
00029	Personal Grooming & Hygiene	11.5min/1981/vidcas
00030	Telephone Manners	10.5min/1980/vidcas
00031	Courtesy Is The Answer	17min/1980/vidcas
00032	Dickey John Automatic Spreader Controls	40min/1980/vidcas
00033	Managing Asssertively	1980/wkbk/6cass
00034	Your Job (Fire Prevention & Action During Fire)	20min/1981/film
00035	Time Mangement For Secretaries	1977/manual/2cass
00036	Keep Reaching: The Power of High Expectations	30min/1977/film
00037	Quality Circles	8 cassette/slides
00038	Productivity & The Self-Fulfilling Prophecy	28min/film
00039	Construction Inspector Responsibilities	14.5min/1982/vidcas
00040	Preventative Maintenance-air,cooling,lube	vidcas
00041	Electrical Systems 1, Batteries	10min/1981/vidcas
00042	Electrical Systems 2, Charging Circuit	10min/1981/vidcas

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00043	Diesel Engine Tune Up	Vidcas
00044	Hydraulic Contamination Control	Vidcas
00045	Pattern For Instruction-Four Step Method	26min/1976/film
00046	Dead Wrong	30min/1980/film/vc
00047	Conflict on the Line: A Case Study	15min/1982/vidcas
00048	Do It Right-Homelite Chain Saw	Vidcas
00049	Pothole Repair Management - 1982	Slide/script
00050	Foremen's Responsibilities	27min/1981/vidcas
00051	Diagnosing the DT-466	197-/vidcas
00052	Pressure Testing the DT-466 Air Induction Sys	197-/vidcas
00053	Troubleshooting the Electrical System	197-/vidcas
00054	Dual Power Hydraulic Brake System, Pt 1 Operation	197-/vidcas
00055	Dual Power Hydraulic Brake System, Pt 2 Repairs	197-/vidcas
00056	Performance Appraisal: Guidelines for Eval'g	1977/wkbk/cass
00057	Training & Coaching: Steps to Improved Perf	1977/wkbk/cass
00058	Setting Goals and Standards	1977/wkbk/cass
00059	How to Eliminate and Control Absenteeism	20min/1979/vidcas
00060	Bridge Deck Repair	8.5min/1981/vidcas
00061	Pothole Repair-1980	Cass/slides
00062	One Small Step(Employee Motivation-James Whitmore)	28min/1982/vidcas
00063	Adding Human Management (Productivity)	1982/cassette
00064	Miracle on Worth Street (Productivity)	1982/cassette
00065	White Collar Workers (Productivity)	1982/cassette
00066	Facilitating Quality (Productivity)	1982/cassette
00067	QC-Circles and Behone (Productivity)	1982/cassette
00068	QC-Circles-Participative Management (Productivity)	1982(cassette
00069	Progress Through People (Productivity)	1982/cassette
00070	Quality-Productivity Connection (Productivity)	1982/cassette
00071	Making It Happen (Productivity)	1982/cassette
00072	Misreading The American Worker (Productivity)	1982/cassette
00073	Case of Working Smarter, Not Harder	16min/1982/vidcas
00074	Tell Me About Yourself (Selection Interviewing)	27min/1980/vidcas
00075	Why Quit Quiz -Cancer Education Programs	15min/1981/vidcas
00076	Women & Smoking - Cancer Education Programs	10min/1981/vidcas
00077	Twenty-Three/Twenty-Eight (Productivity/Everyone)	Vidcas
00078	Value Oriented Creative Thinking-Value Engr	28min/film
00079	Evaluation of Function, Cost, and Worth-Value Engr	27min/film
00080	Seat Belt Video Cassette (Dept Seat Belt Campaign)	28.5min/NHTSA spns
00081	It's In Your Hands (Cancer Education)	45min/vidcas
00082	Work Zone Control-Flagging	15min/1982/vidcas
00083	Low Back Pain	30min/1982/vidcas
00084	One Minute Manager	Vidcas/50min/1982
00085	Doubling Idea Power (Training Div)	Slides/cass/1975
00086	Management by Objectives-Supervisory Skill	1974/12 cass/wkbk
00087	They Can Take It (Raised Markers)	14min/film/1978
00088	Hurricane Agnes	28min/film/1972
00089	Hidden Beauty-Junkyards	15min/film/197-
00090	Heritage of Splendor-Roadside	20min/film/196-
00091	Surface Treatment	1975 film
00092	Help On Highways	196-film
00092	Photogrammetry	196-film
00092	Pottstown Bypass	196-film
00093	Let Nature Work For You	Film
00094	Road to Better Roads-Penn St	Film
00095	On The Job Training	Record/filmstrp/6
00096	Failure Analysis-Diesel Engine Bearings	16min/vidcas/1980
00097	Preventative Maintenance-A Case For Reliability	24min/vidcas/1980

00098	Testing the 680H Relief Valve	4min/vidcas/1980
00099	Servicing Differentials & Planetaries	28min/vidcas/1980
00100	Failure Analysis-Diesel Pistons & Rings	15min/vidcas/1980
00101	Daily Maintenance 680H	9min/vidcas/1980
00102	Failure Analysis-Diesel Value System	10min/vidcas/1980
00103	Oil Flow Through the 680H Hydraulic System	7min/vidcas/1980
00104	Joint Sealing	13min/vidcas/1983
00105	Skills of the Executive-Peter Drucker/James Hays	5cassettes/brochure
00106	Low Volume Road Maintenance	14min/vidcas/1983
00107	Contacts-Customer Relations in Motor Vehicle Bur	25min/1982/vidcas
00108	Assistant County Manager Orientation	15min/1983/vidcas
00109	Blueprint For Safety (Handling Haz Trans Accident)	15min/1983/film
00110	Front End Loaders	New Mex Dot/Vidcas
00111	Highway Noise Analysis-FHWA Demo Proj 45	Cass/slide/12min
00112	Backing-You Owe It To Yourself Series	10min/1983/vidcas
00113	Problem Solving Approach to Planning Cish Flow	3cass/text/1983
00114	Assertiveness for Career and Personal Success	6cass/text/1977
00115	Productivity: Theme of the Future	30min/vidcas/1981
00116	Champion Road Grader (Pre-start Inspection)	20min/vidcas/1983
00117	Planning and Organizing for the Winter Season	10min/1983/vidcas
00118	Strategic Planning	1982/wkbk/6cass
00119	Gas Truck Operator	Vidcas
00120	Bituminous Seal Coat	24min/vidcas
00121	Surface Treatment-Equipment Calibration	1982/vidcas
00122	Materials Inspection	Vidcas
00123	Drainage Pipe Installation	Vidcas
00124	Pit Stop (Supplement to Defensive Driving Course)	Vidcas/film/29min
00125	Learning to think Like A Manager	25min/1983/vidcas
00126	Fingertip Face Massage	19min/1980/vidcas
00127	Experimental Segmental Bridge	28min/1983/vidcas
00128	Executive Writing, Speaking, and Listening Skills	Wkbk/6cass/1983
00129	Ideas That Make a Difference-Ideas From Field	10min/1984/vidcas
00130	Speed Learning-Science and Engineering Edition	1983/cass/wkbks
00131	Problem Solving-Some Basic Prin/Prob Solving-Case	20min/1983/vidcas
00132	Time Management (New) 1983	Text/toolkit/6cass
00133	Story of Radiation (A) Where is It?	Vidcas/1981/15min
00133	Story of Radiation (B) Can We Control It?	Vidcas/1981/15min
00134	Managing Your Time Effectively-Instructor's Kit	Text/cass/1977-81
00135	Dealing With People	Vidcas/1978/14min
00136	Experimental Segmental Bridge-State College, PA	Vidcas/1982/28min
00137	Ideas That Make A Difference II	Vidcas/1984/13min
00138	How To Use Your IBM PC In 10 Easy Lessons	3Vidcas/1982/2hr
00139	Classification and Compensation-Operational Overvw	2Vidcas/1980/80min
00140	Steel Truss Bridge Inspection	Vidcas/1981
00141	It'll Never Happen To Me (Passenger Protection)	22min/198-/Vidcas
00142	Timber Bridge Inspection	Vidcas/1981
00143	Risk Management-Involvement in Tort Claims	Vidcas/1984/20min
00144	Search For Safety	Vidcas
00145	Make Your Investigation Count	Vidcas
00146	Around Every Corner	Vidcas
00147	Oh My Aching Back	Cassette & Slides
00148	Using Managerial Authority	6cass/wkbk/1980
00149	How To Improve Your Memory	6cass/wkbk/1980
00150	How To Be A Successful Public Speaker	6cass/wkbk/1980
00151	How To Motivate For Superior Performance	6cass/wkbk/1982
00152	Supervisor's Guide To Boosting Productivity	6cass/wkbk/1981

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00153	Creative Problem Solving	6cass/wkbk/1981
00154	Managing Conflict	6cass/wkbk/1981
00155	Understanding & Managing Stress	6cass/wkbk/1980
00156	How To Improve Customer Service	6cass/wkbk/1980
00157	Total Time Management	6cass/wkbk/1983
00158	Listen & Be Listened To	6cass/wkbk/1981
00159	Guide For Executive Secretaries & Adm. Assistants	6cass/wkbk/1976
00160	Communications Skills for Secretaries	6cass/wkbk/1981
00161	Pre-stressed Concrete Bridge-Safety Inspection	Vidcas/1984/58min
00162	Forklift Safety-PA DOT Trans Personnel Safety	Vidcas
00163	I-95 Bridge Collapse, Hing Pjn Connection Failure	Vidcas/1983/30min
00164	Parkway East (3/4 & VHS formats)	Vidcas
00165	Research & Training Application for TV/Okla DOT	Vidcas/20min/1984
00166	Behavior of Structural Materials-Part 2	Film
00167	Behavior of Struc'l Mtls, Tensile, Compressive	Film
00168	Ideas That Make A Difference III	Vidcas/1984/13min
00169	Defensive Driving Course	1cass/wkbk
00170	Managing Change-The Human Dimension	Vidcas/33min/1983
00171	Operations Analysis Package (Soap)	1979/Slides/FHWA
00172	Guide To Visual Quality In Noise Barrier Design	1979/Slides/FHWA
00173	New Directions in Roadway Lighting	1980/Slides/FHWA
00174	Development of Priority Accessible Networks	1980/Slides/FHWA
00175	Roadside Barriers	1980/Slides/FHWA
00176	Length of Need and Upgrading	1980/Slides/FHWA
00177	Median Barriers	1980/Slides/FHWA
00178	Introduction	1980/Slides/FHWA
00179	Warrants	1980/Slides/FHWA
00180	Bridge Rails	1980/Slides/FHWA
00181	Crash Cushions	1980/Slides/FHWA
00182	Cost Effectiveness	Slides/FHWA
00183	Emergency Escape Ramps For Runaway Vehicles	Slides/FHWA
00184	Aerial Drainage Survey	1978/Slides/FHWA
00185	Sound Planning	1981/Slides/FHWA
00186	What You Are Is Where You See-Massey Looks-Future	1984/2 Vidcas
00187	Take Care - A Customer Relations Video	Vidcas/1983/20min
00188	On The Job Training	1977/wkbk/4 cass
00189	Corporate Safety Belt Program	1983/film,slid,cass
00190	How To Use Lotus 1-2-3	1983/4cass/wkbk
00191	How To Use Visicalc	1983/4cass/wkbk
00192	Communications/Use as Self-study or Leader's Guide	1983/6cass/handouts
00193	Agri-Access Network-Pennsylvania Pilot Study	1983/vidcas/30min
00194	Conversations with Gov. Thornburgh-Sec. Larson,Trns	1984/vidcas/13min
00195	Alcoa-Recyling, It's Nature's Way	1983/film/15min
00196	Stop Wasting Time	1982/cassette
00197	Selecting & Motivating People	1982/cassette
00198	How To Delegate	1983/cassette
00199	Diagnosing The DT-466 (199B)-PA DOT	Vidcas/1984/40min
00199	Pressure Testing The DT-466 (199A)-PA DOT	Vidcas/1984/40min
00200	Roadmap For Change-The Deming Approach	Vidcas/29min/1984
00201	Using TRIS-Transportation Network	Vidcas/15min/1984
00202	Winter Operations-PA DOT	Vidcas/22min/1984
00203	Ideas That Make A Difference IV	Vidcas/10min/1984
00204	Pothole Repair-PA DOT Maint & Oppr (Manual Incl)	1985/3hr/vidcas/sl
00205	Inspecting & Evaluating Short Term Operations	Instructor's wkbk
00205	Work Zone Traffic Control A. Lane Closure	2vidcas/90min/1985

00205	Work Zone Traffic Control B. Flagging	2vidcas/90min/1985
00206	Stitch in Time-Testing Insulation of Elec'l Conduc	Slides/Cass/83/20m
00207	Effective Team Building	1980/6cass/wkbk
00208	How To Be An Effective Middle Manager	1981/6cass/wkbk
00209	In Search of Excellence	1985/2vidcas/90min
00210	Controlling Vendor Deliveries - Expediting Tips	1973/cass/filmstrip
00211	Designing for Quality-I-90 in Wisconsin (WI DOT)	1984/vidcas/31min
00212	Say It For Safety -Miffling/Juniata Co. Equip Op	Vidcas/24min/1985
00213	America's Highways: Accelerating The Search -PT1	TRB 1985 Cass
00214	Strategies To Enact Traffic Safety Legislation	TRB 1985 Cass
00215	America's Highways: Accelerating the Search PT2	TRB 1985 Cass
00216	America's Highways: Accelerating the Search PT3	TRB 1985 Cass
00217	Strategic Planning: Into and Update	TRB 1985 Cass
00218	MoreSystematic Approach to Traffic Safety	TRB 1985 Cass
00219	Field Perf & Lab Test'g of Aggregate Material	TRB 1985 Cass
00220	Highlights of the new Highway Capacity Manual	TRB 1985 Cass
00221	Weigh In Motion	TRB 1985 Cass
00222	Double Trailers in the Urban Environment	TRB 1985 Cass
00223	Traffic Control During Rehabilitation	TRB 1985 Cass
00224	Impacts of Highway Financing Policies	TRB 1985 Cass
00225	Bicycles & Public Trans-New Strategies for	TRB 1985 Cass
00226	Innovations in Transportation Planning	TRB 1985 Cass
00227	Technician Training & Recognition	TRB 1985 Cass
00228	Making the Environmental Process work thru Coord	TRB 1985 Cass
00229	PennDot...We are Making a Difference	Slides/1985
00230	Strategic Highway Research Program	1985/vidcas/15min

South Dakota DOT
700 Broadway Ave. East
Pierre, SD 57501

Contact: Paul Herman
Training Program Manager

1. Calibrating the Hydraulic Sander
   A course for maintenance personnel in the method of calibration of a hydraulic sander. 21 min.

2. SD 38A
   A documentary on the 1.74-mile experimental section of SD 38A using a thin-bonded Portland Cement concrete overlay, 10.5 min.

3. Testing: Designed as instruction aids:
   a. Density---------- 43 min.
   b. Fine Sieve Analysis---------- 22 min.
   c. Coars Sieve Analysis---------- 23 min.
   d. Moisture Testing---------- 17 min.
   e. Liquid Limits & P.I.---------- 22 min.
   f. Slump Cone & Cylinder---------- 9 min.
   g. Airmeter Calibration Unit
      Weight & Air Content---------- 22 min.

   All of the foregoing are VHS in-house productions

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Title: Asphaltic Concrete Plant Inspector

Description: Course is to help prepare participants to take Asphalt Concrete Plant Inspector Certification tests. Video or slide presentations are part of the course and are from the National Asphalt Pavement Association.

16mm Films

Matter of Judgement
I Told 'Em Exactly How To Do It
Joshua In A Box
A Better Train of Thought
Down and Out
Motor Mania
One-Minute Manager
Go Sober & Safe
Before Help Arrives
The Road Ahead
Highway of Agony
First Aid
Decade of Highway Death

Washington DOT
Transportation Building
Olympia, WA 98504

Contact: Tom Schroedel
Training Director

Walk Around Inspection For Dump Trucks
Video, 7 min. color, 3/4", 1978---------- VC-007

Safety-When ditching in the midst of traffic, front-end loader operators must coordinate with flagmen for on-site safety, Video, 3 min. color, 3/4", 1978-- VC-045

Operator Maintenance of Front End Loaders
Operator maintenance means more than reacting to problems that arise during operations such as tightening a loose fan belt.
Video, 5 min. color, 3/4", 1974---------- VC-045

Oklahoma Bridge Deck
Video, 24 min. color, 3/4"---------- VC-053

The ABC's Of Diesel Engines
Video, 25 min. 3/4", 1978, General Motors-------- VC-111

Wisconsin DOT
State Office Bldg.
4802 Sheboygan Ave.
Madison, Wisconsin 53707

Contact: Maynard A. Schneider
Director, Office of Transportation Information

Designing for Quality

Video, 25 min. 1984.

Describes the rehabilitation of I-90/94 between Madison and Portage which Wisconsin feels is the most significant Interstate rehabilitation project in the U.S. last year.

LAST MINUTE ADDITION

Colorado Dept. of Highways
4201 East Arkansas Ave.
Denver, CO 80222

Contact: Ray Overfield
Training Officer

Bid Rigging - 1 hour 10 min.

Speech made in Keystone by Mr. Paul Dolan from the FBI in regards to investigations made by his Department into contractors of roads. Sam Mallor from the TennDOT also explains how it happened in his Department.
In-house production.

Surface Recycling by Heater Scarification - 12 min.

Project as done by District 6 on West Alameda. Shows procedure used and covers the cost savings of such an operation.
In-house production.

The Squeegee Seal - 16 min.

As performed by District 5 in the southwestern corner of Colorado. Explains cost, method, and equipment needed for this type of surface restoration.
In-house production.

CDOH Lab Tests

Department employees performing the following:

Concrete Slump Test - 4 min.
Air and Weight Test - 6 min.
Forming Cylinders - 2 min.

In-house productions.

-1300

Use of the Vacuum Pycnometer - 21 min.

Proper use of the vacuum pycnometer in performing tests as done by the Department's lab in Greeley. In-house production.

Girder Repairs - 15 min.

Shows how girders were straightened by flame straightening method on bridge near Boulder. Cost savings also discusses. In-house production.

Freeze Thaw Test - 10 min.

Presentation on how the freeze thaw test is performed by the CDOH Lab people in Denver. In-house production.

The Bailey Bridge - 25 min.

Explanation of parts, construction and launching as done by District 4 personnel. In-house production.

CDOH Vehicle Extrication - 44 min.

Procedures and equipment used by Eisenhower Tunnel personnel to free trapped victims from automobiles. In-house production.

Lower Back Care - 30 min.

This is a safety presentation given to District 5 - Section 7 maintenance employees. It deals with the care and prevention of lower back problems as well as some things you can do at home to treat lower back pain.

Avalanche Control - 17 min.

In-house production of methods used by District I in the control of avalances. Taped during the actual shooting of avalanche areas.

Orientation - 30 min.

This tape is intended to provide the new employee with an overview of how the Highway Department functions. A valuable tool for supervisors responsible for orientating new people.

Snow Removal - 18 min.

This in-house production covers a variety of topics. Starts with the preparation of equipment and extends into snow removal as done by District I. Tips are given on how to safely operate a plow and deal with traffic problems. A good tape to show to new plow operators as well as public groups.

Massachusetts Office of Transportation
and Construction
Department of Public Works
10 Park Plaza
Boston, MA 02116-3973

:60 Sec. Public Service Announcement to ease congestion caused by Southeast Expressway in Boston. Professionally produced by Ken Swope & Associates of Boston , received terrific play on all the local TV stations and a 30-sec. version was aired extensively by radio stations. To the tune of "Ruby, Don't Take Your Love To Town" Swope's piece musically implores motorists to "Don't Take Your Car To Town" to a montage of construction activity, traffic jams and commuter options.

Contact: Janice M. Saragoni
Director
Public Information

State Of New Hampshire
Department of Public Works and Highways
John O. Morton Bldg.
Concord, NH 03301

One videotape: "Operation Clean Sweep" - this 16 min. program highlights the Department's 1984 award-winning roadside litter cleanup effort. Produced in-house: available on 3/4" U-matic or 1/2" VHS.

Contact: Bill Rollins
at the above address

North Dakota State Highway
Department
600 East Blvd. Ave.
Bismarck, ND 58505-0178

Contact: Terry Wiklund
Audiovisual Section
Administrative Services Division

(Next three pages for North Dakota)

1. MISC. 3. FILE FOOTAGE 5. HOLDS 7. ERASE 9. BIS. EXP. BRIDGE 11. SOLD
2. C. O. LISTING 4. WORK 6. PRODUCTION 8. MAX. OVERPASS 10. DIV./DIST. 12. PSA

(North Dakota)

3/4" VIDEO TAPE MASTER

NOTE: As of March 20, 1985, this file MUST be remerged with VTM 3/4 FILE

REC. ID.	TAPE NO.	DATE	LENGTH	TITLE	DESCRIPTION	STATUS	LOCATION	PASSES
2	A0002	04-14-81	60	I-94 MAINTENANCE	Near Dickinson-patches, waves, bridge, guardrail, and overpass damage	02		02
					north ramp	08		13
6	A0006	01-05-81	60	TORT LIABILITY	Liability of State Transportation Officials - AASHTO			02 02
10	A0010	03-15-81	40	"OLD RED TRAIL"&"HIGHWAY IN CRISIS"	Video Copies of Slides-Tape	01		01
12	A0012	02-17-81	40	"GIVE US A CHANCE"	Child Safety Seats	10	Traffic Safety	01
13	A0013	05-05-83	40	I-94 RECONSTRUCTION	Near Chicago, Illinois (IL Dept of Trans.)	02		10
21	A0021	05-11-82	60	"CONC. FIELD TEST."&"ASPH. PAV. INSP."	Film Dub. - Utah Hwy. Dept.	02		02
22	A0022	03-31-80	15	STRESS	Produced by A.H.A.	02		01
29	A0029	05-03-82	20	HIGHWAY JOINT RESEALING	Herculus HBR Backer Rod - B&W	02		08
34	A0034	05-06-83	60	ALCOHOL & THE TROUBLED EMPLOYEE #2	Master - Al Gillette from Heartview Foundation - Tape #1 - A0124	02		02
37	A0037	07-09-81	60	"SUPPORT SERVICES"-"RECORDS MANAGEMENT"	Masters - Reedited Record Mgmt - Tape #A0015	02		01
40	A0040	07-09-81	60	RECRUITMENT & SELECTION	Master - edited	07		02
47	A0047	08-25-81	60	INTERVIEW TAPE & CLASSIFICATION	Master	02		01
49	A0049	09-09-81	60	WORK	Records Management	10	Personnel	02
52	A0052	05-31-83	45	"GROWING PAINS"	DUI	10	Traffic Safety	03
53	A0053	08-03-83	45	"CALL TO ACTION"	DUI	10	Dann Stuart	02
58	A0058	08-01-83	45	SQUEEGEE SEAL	Colorado Department of Highways	10	Construction	02
64	A0064	09-79	60	CLASSIFICATION & COMPENSATION - PART 1	An Operational Overview	02		01
65	A0065	09-79	30	CLASSIFICATION & COMPENSATION - PART 2	An Operational Overview	02		01
66	A0066	07-19-82	45	INTRO. TO BRIDGE INSPECTION	Master	02		01
67	A0067	12-02-81	45	EVALUATION	Master, edited	02		01
68	A0068	09-28-83	45	VIDEO TAPE: A TRAINING TOOL	Master	02		03
69	A0069	12-11-81	60	TIMBER BRIDGE INSPECTION	Master	02		01
74	A0074	05-10-82	30s	AGGREGATE SAMPLING	Film to video transfer	02		02

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(North Dakota)

REC. ID.	TAPE NO.	DATE	LENGTH	TITLE	DESCRIPTION	STATUS	LOCATION	PASSES
77	A0077	05-20-82	45	VARIOUS N.D., P.S.A.	Master	02		02
80	A0080	11-01-82	5	TEENAGERS AND DRINKING #2	Good Morning America - edited master - Part #1 - Tape #A0101	10	Traffic Safety	02
100	A0100	02-08-85	30s	I-29 RECYCLE - HILLSBORO	Copy - 3rd Generation - Edited	02		02
101	A0101	01-11-82	60	TEENAGERS & DRINKING #1	Good Morning America - Part #2 Tape #A0080	05		01
103	A0103	08-15-85	60	PSA DRUNK DRIVER & SEAT BELTS	Copy U. of Mich.	02		02
113	A0113	01-14-83	75	TEENAGERS & DRINKING	Copy edited - Good Morning America	10	Traffic Safety	01
115	A0115	12-16-82	45	CARL EIELER - 5TH SUPER BOWL	Master edited	02		01
119	A0119	02-16-83	45	EFFECTIVE LISTENING	Copy	05		01
123	A0123	05-18-83	30	UNDER THE INFLUENCE	Master	02	Traffic Safety	01
124	A0124	05-06-83	75	ALCOHOLISM & THE TROUBLED EMP. #1	Master - Al Gillette - Heartview Foundation - #2 - Tape #A0034	02		01
126	A0126	05-23-83	30	LONG TUCK DEMONSTRATION	California Highway Patrol	10	Truck Reg.	01
132	A0132	08-84	10	FREDDIE & FRANK, IT'S UP TO YOU	State of Oklahoma on Flagging	02		02
137	A0137	06-21-83	30	NEW DUI LAW	Praire Public TV	05		01
138	A0138	11-28-84	30	UNDER THE INFLUENCE	DUI	10	Dann Stuart	02
139	A0139	06-29-83	30	MEETINGS, BLOODY MEETINGS		02		02
140	A0140	08-15-85	30	STRATEGIC HIGHWAY RESEARCH	Commonwealth Media Services	10	Norlyn Schmidt	02
142	A0142	08-17-83	30	"BORN TO WIN"	Zig Zigler	02		01
150	A0150	01-10-84	60	ALCOHOLISM: Under the Influence	NOVA - Public Broadcasting	10	Traffic Safety	02
151	A0151	10-10-83	30	"A TEAM OF TWO"	Master - Alan Lakeins Time Management	02		01
152	A0152	10-10-83	30	"THE TIME OF YOUR LIFE"	Master - Alan Lakeins Time Management	02		01
168	A0168	11-09-83	45	BUSINESS OF MANAGEMENT	Organizational Conflict	02		01
173	A0173	12-08-83	30	KIVENS STORY	Master D.U.I.	02		01
180	A0180	12-12-83	45	KFYR D.U.I. SPECIALS	Dec. 10 & 11, 1983	10	Traffic Safety	01
182	A0182	12-13-83	30	"KTHI TV 11 FARGO "INSIGHT"	D.U.I. Dec. 18, 1983	10	Traffic Safety	01
185	A0185	01-30-84	60	"GROWING UP STONED"	HBO Special	10	Dann Stuart	01
187	A0187	01-19-84	30	ALCOHOLIC TRAFFIC SAFETY	N.D. P.S.A. on Alcohol	10	Dann Stuart	02
188	A0188	01-25-84	15	"DRUGS, DRINKING & DRIVING"	Film to Video Dub.	10	Dann Stuart	02
190	A0190	03-14-84	60	DRUNK DRIVING PSA'S	National - Copy	10	Dann Stuart	02
191	A0191	03-14-84	60	EDITED HOLNBOE FOOTAGE	Hist. Soc. has master	02		01
192	A0192	03-14-84	60	FEDERAL EMERG. RELIEF ASSN. IN N.D.	Hist. Soc. has master	02		01

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REC. ID.	TAPE NO.	DATE	LENGTH	TITLE	DESCRIPTION	STATUS	LOCATION	PASSES
195	A0195	03-27-84	30	"PARTY'S OVER"	Film Dub. to Video DUI	10	Traffic Safety	01
197	A0197	04-17-84	75	EDITED - BRIDGE INSPECTION	Master - State of Oregon	02		01
201	A0201	04-30-84	5	PSA TRANSPORTATION WEEK 1984	Master Edited	02		01
206	A0206	04-15-84	30	INSP. OF PIN & LINK DETAILS ON BRIDGE STRUCTURES	Copy of ½" reel to reel	02		01
219	A0218	07-01-84	30	"CHILDREN IN PERIL"	DUI - WPBS Special	02		01
226	A0225	08-01-84	30	CHILD RESTRAINT VIDEOS OF MICH. AND CALIF.	Sent to State of Michigan	10	Judy Froseth	01
227	A0226	08-01-84	30	CHILD RESTRAINT TRAINING FOR LAW ENFORCEMENT	Copy for S.D. Traffic Safety	02		01
228	A0227	11-01-84	30	GET IT TOGETHER KANSAS, SAFETY IS A SNAP	Copy from Kansas Hwy. Dept.	10	Judy Froseth	01
229	A0228	11-01-84	?	CLOWN TAPE	Copy from Kansas Hwy. Dept.	10	Judy Froseth	01
230	A0229	12-13-84	60	CONTRACT FOR LIFE: THE S.A.D.D. STORY	CBS Special Unedited	02		01
233	A0232	10-14-85	30	REASON TO LIVE	DUI	10		01
	A0234	02-27-85	75	BITUMINOUS PLANT INSPECTION	Copy from Wash. State DOT	02		01
	A0235	02-27-85	45	BITUMINOUS CONCRETE PAVING	Copy from Wash. State DOT	02		01
	A0236	02-27-85	30	BITUMINOUS SEAL COAT FIELD TESTING CONCRETE PART 2	Copy from Wash. State DOT	02		01
	A0237	05-01-85	45	WORKPLACE HUSTLE	Master Copy from Clark Comm.	02		01
	A0238	05-13-85	30	GETTING TO KNOW THE IDAHO TRANS. DEPT.	Copy from Idaho Trans. Dept.	02		01
	A0239	05-15-85	30	"TRAFFIC TRAILS! HEAVEN WON'T WAIT"	Master - Film Dub	10	Traffic Safety	01
	A0240	05-17-85	30	"ONE FOR THE ROAD"	Master - Film Dub	02		01
	A0242	06-24-85	75	"M.P.H. RADAR COURSE"	Copy from 1/2"	10	Traffic Safety	01
	A0247	08-09-85	30	COMMERCIALS SEAT BELTS/DESIG. DRIVER	Copy from MSLA Health Dept.	10	Judy Froseth	01

APPENDIX D

IDAHO TRANSPORTATION DEPARTMENT

Video Resource Library

IDAHO TRANSPORTATION DEPARTMENT

VIDEO

RESOURCE LIBRARY

TRAINING AND DEVELOPMENT SECTION

MARCH, 1986

Idaho Transportation Department

VIDEO MASTER LIBRARY

The following programs are available to all members of the Department. They may be obtained on loan or permanent copies can be made by Training & Development (T&D) for your permanent Headquarters or District Training libraries. Formats are: 3/4" U-matic; 1/2" Beta I, II, III, or 1/2" VHS.

To speed up the process of ordering programs, all requests should be directed to: Bill Harvey, T&D - 334-4057.

Each program has a short form for you to fill out and return to T&D whether you keep the program or not.

If you have special requests for programs not listed in this or other Department catalogs, please contact T&D and a nationwide search will be made to try and obtain the programming for you.

When ordering programs simply use the number at the left of the catalog listings.

PROGRAMS

Training & Self-Development

1. 3-M Training Tape: (each segment approximately 15 min.)
   Cut 1 - How to Act in Front of a Camera
   Cut 2 - Teaching Camera Techniques
   Cut 3 - Sets & Props

2. 3-M Training Tape:
   Cut 1 - Proper Lighting
   Cut 2 - Setting Up Equipment
   Cut 3 - How to Produce a Video Program

3. Time of Your Life - 26:00
   Narrated by James Whitmore. Teaches you how to budget your time so that you get the most benefit out of each day.

4. Leadership - Style or Circumstance - 30:00
   An in-depth program on developing your leadership style - very historical utilizing great figures from the past.

5. Something To Work For - 30:00
   Another motivation program with some very good points.

6. Job Orientation For Supervisors - 9:00
   A short program to help get you started on the right track.

7. You'll Soon Get The Hang of It - 20:00
   Narrated by English comedian John Cleese. A solid, how-to and how-not-to learn to do something "hands-on".

8. Management of Human Assets - 27:00
An interview-type program exploring the contributing factors that identify leaders in our society. Some very good hints on improving your leadership style.

9. What Do Employees Think? - 28:00
A U.S. Air Force motivation program. It shows what a proper program can do to tremendously increase job enrichment. An excellent program adaptable to most work situations.

10. Survival Training - 15:00
A very dramatic program showing what can go wrong if you are not properly trained in effective police methods. Mainly for Law Enforcement personnel. LAPD production.

11. Telephone Courtesy - 26:00
A Mountain Bell program detailing proper telephone communications.

12. Ideas That Make a Difference - 18:00
A roundtable discussion of an idea submittal program that has reaped benefits for the PennDOT.

13. Shop Productivity In Action - 8:44
How to create a more efficient and better working environment in a typical Transportation Department shop. PennDOT.

14. "IF" - The Excuse Cop-Out - Why Work Was Not Done - 20:00
Shows you how to rectify the situation.

14A- Future Shock - 40:00
A look at where we are headed. Narrated by Orson Welles.

Other Training Programs

15. Truck Driver Training - Part I - 45:00
Slide to Video - ConnDOT.

16. Truck Driver Training - Part II - 45:00
Slide to Video - ConnDOT

Welding Series

17. Arc Welding Methods - 26:21
Miller Welding

18. Gas Tungsten Arc Welding - 30:00
Miller Welding

19. Short Circuiting Metal Transfer - 30:00
Miller Welding

Train-The-Trainer Series

20. Training Methods - 20:00
Part I. An interesting feature on ITD training methodology.

21. Training Methods - 45:00
Part II. A continuation of Part I with members of the Training staff participating.

22. Training Problems - 17:00
Discusses problems that can be encountered in a training situation.

23. Use of Overhead Projectors - 6:17

24. Using Video Tape Equipment - 6:30

25. Using Hand's On Materials, Models, etc. - 4:35

26. Using 16mm Projectors - 9:00

27. The Rewards of Being a Trainer - 40:00
A candid group discussion of what rewards trainers get from training others.

28. Involvement In Training - 12:00

29. The Ideal Training Climate - 11:00
How to obtain the proper physical and mental environment for the best training situation.

30. Using Slide Projectors - 7:00

31. Proper Use of Language in Training - 7:00

32. Knowledge Levels of Students - 10:00
Differentiating various knowlege levels among students.

33. Organization - 5:00
Organizing your material for maximum benefit to trainees.

34. Field Specialists - 4:00
Using experts in the field to train others.

35. Handout Materials - 4:00
Supplementing training with the use of proper handouts.

36. Flip Charts - 6:00
Showing how to use them properly.

Ports of Entry

37. Full-Fee Registration Procedures - 1:33 hr.
An ITD in-depth Ports of Entry training program
(For more Port programs see: Motor Vehicle Bureau listing)

Equal Employment Opportunity

38. Sexual Harassment On The Job - 18:00
A series of dramatizations showing what should not be done in the workplace regarding the opposite sex.

Safety

(This heading overlaps other areas)

39. Hazardous Materials Training - 47:00
Discusses all aspects of chemical spills, safety, prevention and solutions. Slide to video. ConnDOT.

40. Crash Cushions - Safety by the Barrel - 15:00
Explains the need for steel safety crash cushions by U.S. Steel. Many illustrations of before and after improvements.

41. Impact Barrier Luminaire Supports - 15:00
A highway safety program produced by Texas Highway Institute and FHWA.

42. Crashes That Need Not Kill - 28:00
Shows the scientific development here ana abroad of safety systems to save thousands of lives from crippling car crashes. Insurance Institute for Highway Safety.

43. Protection In The Nuclear Age - 26:00
Shows what to do in the event of a nuclear attack and how to survive. Federal Emergency Management Agency.

44. Those Vital First Moments - 20:00
Shows what to do during the first few minutes around chemical spills and other hazardous materials. E.I. Dupont.

45. Danger Zone - Your Back - 18:00
Shows proper ways to lift.

46. A New Way To Lift - 8:00
Employee safety.

47. The Ears & Hearing - 21:00
Employee safety.

48. How To Avoid Muscle Strain - 13:00
Employee safety.

49. BLEVE - 15:00
What happens and what to do in the event of a gas explosion.

50. Anhydrous Ammonia and Your Safety - 12:00
Accidents involving ammonia gas and what to do about them.

51. Partners In Safety - 20:00
FHWA/Intermodal Transportation

(Safety - Continued)

52. Multiple Choice - 26:00
A test of survival around various types of equipment. Caterpillar.

53. Sold On Safety - 12:51
An OklahomaDOT safety presentation.

54. Front End Loader Safety - 13:00
Relates to mining operations, but some good safety tips.

55. Safety On The Move - Truck Haulage Safety - 16:00
Relates to large mining trucks, but has considerable good safety information for all truckers.

56. OSHA Compliance in Construction & Maintenance - 58:00
Construction Equipment; Excavation; Shoring & Steel Erection; Ladders & Scaffolding; Welding, Compressed Air, Electricity - slide to video.

56A. OSHA Highway Construction, Equipment, Excavation, etc. - 26:00
A short version - slide to video.

57. 48-Foot Truck Demonstration - 10:00
Shows off-tracking on urban streets and highways while truck travels throughout Idaho - 1983.

57A. Tire Hydroplaning - 15:00
Shows what happens when vehicle drives over wet surfaces.

Concrete - Cement

58. Portland Cement Recycling - 15:00
A North Dakota-PCA program showing an innovative way to recycle concrete pavement while salvaging the rebar.

59. Slipform Paving for Inspectors - 10:00
This TexasDOT program lays it on the line showing specifically what an Inspector should be looking for on a project.

60. Concrete Pavement Restoration - 20:40
An OklahomaDOT production showing the correct methods of restoring concrete pavement.

61. Recycling Portland Cement - 28:40
An excellent OklahomaDOT program on the subject.

62. Construction Inspector's Responsibility - 18:00
This PennDOT program covers all phases of what an Inspector should be doing on a project - properly.

63. New Generation High-Speed Concrete Cutting - 16:00
A Concrete Coring Co. production showing the latest equipment used for various types of high-speed concrete cutting (including rebar).

Contract Administration

(Construction)

64. The Road To Clean Water - 24:00
Construction does not have to pollute streams. MarylandDOT.

65. Nuclear Densometer Test of Plantmix Pavement - T-125-80 - 25:00

66. CPR - Concrete Pavement Restoration System - 26:00

67. Materials Sand Equivalent Test - T-176 - 17:30

68. Materials Cleanliness Value - T-72,73 - 12:00

69. Concrete Treated Base - 24:00
UtahDOT

70. Design & Control of Concrete Mixes - 40:00
FHWA

71. Introduction to Sieve Analysis - 31:30
ITD

72. Traffic Control During Seal Coat Operations - 5:00
ITD

73. Engineer's Levels - 36:19
OSU

74. Theodolite & Transit Vernier Systems - 34:00
OSU

75. Use of Theodolites & Transits - 45:24
OSU

76. Surveying: Field Use Of HP-3805A - 37:33
OSU

77. Portland Cement Concrete Testing & Sampling - 27:00
UtahDOT

78. Aggregate Sampling - 13:00
UtahDOT

79. Asphalt Paving Inspection - 27:00
UtahDOT

80. Principles of the Asphalt Finisher - 16:00
Barber-Greene

81. Seal Coat Inspection - 12:43
ITD

82. Checking Asphalt Distributor Spread Rate - 24:00
ITD

83. Asphalt Emulsion Spray Applications - 26:00
Asphalt Institute

84. Roadside Seeding For Inspectors - 26:00
ITD - Divided into segments

Maintenance & Equipment

85. Techniques for Superior Asphalt Paving - 28:00
Barber-Greene

86. Seal Coating - 14:00
Slide to video. ITD. General in nature.

87. Asphalt Recycler - 15:00
A MontanaDOt demo on the Simpson Mfg. Co. portable asphalt batch plant - a very saleable demonstration.

88. Save That Road - 22:23
Part I - An OklahomaDOT program showing various ways of road rehabilitation.

89. Save That Road - 27:22
Part II - A continuation of Part I.

90. Pothole Patching - 13:11
One of the best programs around on the subject. A Roy Jorgenson video in cooperation with the IRF for the Kingdom of Saudi Arabia.

91. Joint Sealing - 18:00

92. Motor Grader Operation - 45:00
A complete rundown by WABCO experts on getting the most out of a road grader.

93. Articulated Wheel Loader Operator's Guide - 20:00
A Caterpillar program hosted by an expert stressing efficiency and safety.

94. Maximizing Drum Mixing - 17:00
A Barber-Greene program on asphalt drum mixing operations.

95. Elgin Broom Brake Test - 12:00
Testing conducted at D-5, Pocatello around 1981.

96. More Productive Trucks - 27:00
A Western Highway Institure program. Getting the most out of your fleet.

97. Walkaround Inspection for Dump Trucks - 8:00
Important things you should look for.

98. The Business of Backhoe Loader Operations - 19:20
Tricks of the trade and how to utilize them.

99. Operating Tips For Wheel Loaders - 28:00

100. Tab Placer Invention - 15:00
Shows a D-2 invention which illustrates a much more efficient method of placing striping line tabs compared to walking the highway doing it by hand.

101. Loader Operation - 20:00
Part I - NebraskaDOT

102. Loader Operation- 16:00
Part II - NebraskaDOT

103. Motor Grader On Unpaved Roads - 13:00
OklahomaDOT

104. Tilt Bed Trailers - Part I - 15:00; Part II - 12:00
OklahomaDOT

105. Preventative Maintenance Overview: 14:00; Trucks-Part I-19:00; Trucks-Part II - 18:00. OklahomaDOT

106. Motor Grader - Part I - 19:00

107. Motor Grader - Part II - 18:00

108. Motor Grader - Part III - 18:00

109. Safety & Operator Maintenance of Front-End Loaders - 8:00

110. Heat Pipes - 20:00
Utilizing heat pipes using stored earth heat to melt ice and snow on off-ramps in Virginia. Virginia-FHWA.

111. Winter Season Operations - 25:00
PennDOT

111A. Holiday Driving PSAs (Idaho) - 30 sec. & 10 sec.

112. Winter Driving PSAs - 20 sec.
Office of Highway Safety - ITD

112A. Snow Removal - 15:00
ColoradoDOT

Design

113. Roadside Safety Design - FHWA - 7 Programs on one Tape.

1. Cross Section - Slope Grading - 11:00
2. Bridges - 20:00
3. Drainage Appurtenances - 14:00
4. Gore Areas - 5:30
5. Signing - 23:00
6. Delineation - 7:00
7. Lighting - 7:00

113A. Designing For Quality - I-90/94 in Wisconsin - 30:00
WisconsinDOT.

113B. Drainage Pipe Placement - 20:00
PennDOT

113C. Design Of Urban Streets: This is a complete 16 tape training program for Transportation Department design engineers covering everything from Design Elements, Capacity, Environmental Considerations, social & Economic Impacts, Illumination, Signs, Markings, traffic signals, etc. Each program is 30:00 in length. FHWA

Bridges

114. Spanning The Canyon - 26:00
Perrine Bridge documentary showing the history and construction of this U.S. 93 National Award-Winning Structure. 1976.

115. Sandpoint Bridge Construction - 10:00
General construction scenes - about 1980.

116. Sandpoint Bridge Dedication - 10:00
KREM-TV (Spokane) news program. 1981.

117. Heat Transfer - Bridge Deck De-Icing - 40:00
Very informative program hosted by Prof. Pell, U of Colorado. Earth heat utilization.

(Bridges - Continued)

118. Ada County Bridge Cave-In - 5:00
Channel 2 TV News program - 1982.

119. Timber Bridge Inspection - 49:00
OregonDOT

120. Better Bridge Decks (For Inspectors) - 26:00
MarylandDOT/FHWA

121. Building Better Concrete Bridge Decks - 26:00
MarylandDOT/FHWA

122. Concrete Bridge Deck Construction - 40:00
OhioDOT/FHWA

Highways-General

123. Anatomy of a Road - 30:00
A good general program for new employees or the public showing how roads are built from conception to completion.

124. Everything Rides on the Roads - 28:00
The history of American roads over the past 80 years.

125. Evolution of a Highway - 23:00
An excellent slide present a tion converted to video showing the history of highways in America from Indian trails to the present day. FHWA

126. Getting There From Here - 26:00
An overview of transportation in the U.S. narrated by Lowell Thomas.

127. New Realities - 17:45
Discusses national highway needs and the value of transportation. Highway Users Federation.

128. Footbridge Dedication - 20:00
A tongue-in-cheek ITD-FHWA dedication featuring Roy Jump, Bob Jarvis (who was missing) and a small footbridge over the canal between Headquarters and the Fisher House in Boise.

129. Overview of Urban Transportation Planning - 26:00
Divided into four sections: Transportation Planning; Transportation Problems; Alternatives, Urban Transportation Planning Program. FHWA slide/video program.

130. Highways of History - 30:00
Slide/video program. Very historical.

131. Forgiving Highways - 15:00
FHWA program discussing the elimination of roadside hazards.

132. AASHO Road Test - 37:00
49 states contributed over $26 million to conduct a massive pavement testing program consisting of three tests including one in Idaho in 1951. The purpose of the tests was basically to determine proper engineering loads for future Interstate construction. (AASHO-Highway Research Board)

133. Truck and Bus Fuel Savings - 18:00
An FHWA cooperative program.

134. Riding on Waste - 20:00
Making black base using incinerator waste. FHWA.

135. Drive For Economy - 17:00
(Truck Driver Series) Slide to video for truck fuel economy.

135A. Drive For Economy - 15:50
IllinoisDOT. Professional tips for auto fuel economy.

136. The Professional Driver - 17:00
(Truck Driver Series) Slide to video. Many tips for better driving.

137. Tire Maintenance - 17:00
(Truck Driver Series) Slide to video. Shows how proper tire maintenance saves money.

138. Preventative Maintenance Inspections - 21:00
(Truck Driver Series)

139. Tire Assembly & Disassembly - 22:00
(Truck Driver Series) Slide to video.

140. Elgin Sweeper Co. presents: "The Whirlwind Delivery Report" - 20:00. An in-depth look at the Elgin sweeper and its maintenance.

155. Shake Hands With Danger - 26:00
A very though-provoking sad and humorous look at how to do it right and wrong working with heavy equipment. Caterpillar.

157. Chemical Safety: (Teltrain) - Part I - 19:30; Part 2 - 20:30; Part III - 20:00. Covers all types of chemicals, accidents and protection.

158. Potholes in Paradise - 15:00
3 night series on Ch. 7 TV News, Boise. 1985. An in-depth look at the pothole problem in the Boise Valley.

159. Port of Lewiston - 15:00
Board Chairman Carl Moore and FHWA Barry Morehead discuss Port and its relationship to US-12 and Wilderness Area legislation in Central Idaho. About 1982.

160. Computerized Fuel Allocation Program - 15:00
ITD production.

161. Operation "Junklift" - 20:00
Removing junk cars by National Guard helicopters in Boise area around 1980. Shows complete recycling process from junk to useful steel products. ITD production.

162. Bulk Storage of Striping Paint - 16:00
Another money-saving program developed by ITD to save costs on the purchase of striping paint and improve delivery and storage efficiency.

163. Ride-Sharing - 12:00
ACHD program produced by ITD. Needs to be recopied using slide dissolver. With narration.

164. Running on Empty - 26:00
Fuel saving tips for automobiles - very informative. Dept. of Energy.

Traffic

40. Crash Cushions - Safety by the Barrel - 15:00
(See Safety)

41. Impact Barrier Luminaire Supports - 15:00
(See Safety)

42. Crashes That Need Not Kill - 28:00
(See Safety)

113. Roadside Safety Design - (7 Programs)
(See Design)

165. Special Crosswalk Illumination for Pedestrians - 45:00

166. Thermoplastic Striping - 12:00
TexasDOT. An excellent program on how to do it properly.

167. FARS (Fatal Accident Reporting System) - 13:00
Part I - Overview - 1985.

168. FARS - 12:00
Part II - Update

100. D-2 Centerline Tab Placer Invention - 15:00
(See Maintenance & Equipment)

167A. Guard Rail Installation - 21:30
OklahomaDOT

168A. Breakaway Barricades - New Style - 20:00
Use of PVC pipe. FHWA/NevadaDOT.

Archaeology

168B. US-95 Dig, Spalding area (1982) - Part I

169A. US-95 Dig, Spalding area (1982) - Part II

168C. Archeology - Building On The Past - 27:40
A program showing the liaison between archeologists and highway builders. A dig dating back thousands of years. OhioDOT, 1977.

Employee Orientation

169B. PennDOT Orientation for New Employees - 15:00

170. Iowa Employee Orientation for New Employees - 15:00

171. Idaho Employee Orientation Program - 11:30

172. Port of Entry (Idaho) Employee Orientation - 12:00

Flagging Operations

172. Freddie & Frank (Plus - Successful Living) - 20:00
OklahomaDOT. A good show for entertainment during meetings or training sessions. The host is an Oklahoma District Engineer who does an excellent job. Humorous.

Weed Control

173. Rope Wick Strikes Again - 18:25
OklahomaDOT. Shows proper use of rope wick in weed control.

Ports of Entry

174. Full-Fee Registration Procedures - 1 hour 33 min.
Ports of Entry Training

172. Port of Entry (Idaho) Employee Orientation - 12:00

Materials

175. Gradation Test (Part I) - 22:00
ITD

176. Gradation Test (Part II) - 22:00
ITD

177. Sand Equivalent Test - 17:30
ITD

178. Engine Oil Analysis - 15:00
Chemist Linda Slupe explains Mtls. Lab oil sampling Program.
ITD

Condemnation-Public Hearings-Meetings

179. Bonners Ferry Condemnation - 10:00
Video of land parcels (with narration) for condemnation for possible court proceedings by ITD legal staff. Illustrates an excellent use of video.

180. Wallace Public Hearing - 40:00
Slide/video/narration presentation used at Wallace hearing in 1983.

181. Boise I-84 IC Public Hearing - 40:00
Slide/video/narration presentation used at Boise hearing in 1981.

182. Horseshoe Bend Hill - ITD Board meeting with former Gov. Bob Smylie, Lydia Richards, etc. 1984. Ch. 7 News. 3:00

Interviews

183. Canyon County Forum - 30:00
Channel 6 TV program, 1982. DE Bill Sacht fields questions about his District's activities. An excellent example of superior Public Relations.

Miscellaneous Idaho Construction

184. US-95, Marsing South around 1981.

185. Horseshoe Bend Hill Slide Repair - 1983.

186. Horseshoe Bend Hill Paving - Sawdust Fill - 1983.

187. I-90 - Mini-bench construction on Lookout Pass - early 1980s.

188. Horseshoe Bend Hill Construction - 1983.

189. Horseshoe Bend Hill Sawdust Fill Work - 1983.

Motor Vehicle Bureau

190. Safeguards in Transporting Nuclear Materials - 15:00
Shows police powers Dept. of Energy has including a mock attack on a nuclear shipment. Very educational.

191. Emergency Braking - 17:30
Motor Vehicle Mfg. Assn. Shows proper procedures to brake out-of-control trucks.

192. Roll-Over - 21:30
Motor Vehicle Mfg. Assn. How to avoid in trucks.

193. Federal Motor Carrier Safety Regulations (Introduction) - 15:00

194. Federal Motor Carrier Safety Inspection Procedures - 20:00

195. Driver Qualifications - 15:00
Motor Carrier Safety - USDOT

196. Hours of Driving & Record Keeping - 15:00
Motor Carrier Safety - USDOT

197. Safe Transport - Closed Container Fires - Compressed Gases - 60:00

198. Radiation Naturally & Mississippi RAM Accident - 59:00

199. U.S. & British RAM cask tests - 20:00

199A. Tuesday, May 19, 1981 (What Happened During a Hazardous Materials Accident.) Union Carbide - 26:00

Employee Welfare

200. Employee Group Insurance Update (Jan. 1986) - 27:00
An interview with Cynthia Davis (Office of Group Insurance) and Training's Mary Bradford; explaining benefits, changes, etc.

(NOTE: Supplements of additional programs will be furnished to all recipients of this video resource catalog as input warrants.)

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