

**AN EVALUATION OF THE USES, BENEFITS,
AND COSTS ASSOCIATED WITH VIDEOTAPE
PRODUCTION IN THE VIRGINIA
DEPARTMENT OF TRANSPORTATION**

by

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VIRGINIA TRANSPORTATION RESEARCH COUNCIL

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

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LIST OF TABLES

	<u>Page</u>
Table 1 Proposed Video Equipment, Quantity, Assignment and Cost - SP System.....	9
Table 2 Proposed Video Equipment, Quantity, Assignment and Cost - Industrial System.....	10
Table 3 Alternative Editing Configurations.....	13
Table 4 Average Video Equipment Expenditure by Administrative Unit.....	14

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BACKGROUND

Videotape has become the state-of-the-art communications tool for corporate, industrial, and government agencies. It is superior to conventional slide or movie film because 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 materials (tapes) are reasonably inexpensive. For these and other reasons, transportation agencies are using videotape technology more and more to provide training programs for employees, present research findings, document field operations and experiments, and as a general communications tool. The need for an assessment of the application of this medium to the Department's operations has often been voiced by many of the managers and staff.

Just a few years ago, wide consumer use of videotape technology was experimental. Production costs were high and quality was low. Playback machines were bulky, and portability was questionable. However, rapidly advancing technology has resulted in a decline in the cost of equipment as well as enhancements to the quality and versatility of both the medium and the equipment. Thousands of public agencies and private companies now develop myriad videotape programs for various uses. Moreover, as a training tool, videotape has become the state-of-the-art for both classroom and field use.

A 1985 management review of the Information Services Division recommended that the potential for the use of videotape within the Department be explored. Specifically, the report states, "Video would be a mechanism for communicating information to the media, the public, and employees. Its usage in providing information related to research, training, technology transfer, and basic communications would be endless." The report further recommended the establishment of a task force to fully evaluate the uses, benefits, and costs associated with video productions. It further specified that this task force should include representatives from the Research Council, the Information Services Division, and the Personnel Division. With the concurrence of the Administration and Finance Research Advisory Committee, Mr. Howard Newlon, Director of the Research Council, in his memorandum of August 5, 1985, appointed the following employees of the Department to be members of the Video Task Group.

Cheryl Jenkins, Public Information Officer, Chairperson
Aubrey Baird, Administrative Services Officer
Ann Smoot, Central Office Training Officer
Willie Heath, Audio Visual Education Specialist
Bill Colavita, Senior Management Analyst
Mike Bowyer, Information Director
Fred Altizer, Salem Resident Engineer
David Gehr, Director of Operations
Lynda South, Public Affairs Manager
Ron Hall, Salem District Training Officer
Jon DuFresne, Culpeper District Traffic Engineer
Jim Melone, Equipment Engineer
Mike Perfater, Research Scientist, Executive Secretary

In addition, the following representatives from various state and federal agencies were appointed.

Tony Solury, FHWA, Division Planning & Research Engineer
Mickey Hendricks, Director of Telecommunications, University of
Virginia
Lou Hinshelwood, Audio Visual Specialist, Division of Game and Inland
Fisheries

With the resignation of Cheryl Jenkins, former chairperson of the group, Mr. Newlon appointed Jim Melone as chairman.

The Department is currently ill-equipped to do little more than show existing prerecorded videotape programs in the 3/4" format. At the outset of the study, there were five videotape cameras and 1/2" recorders scattered among a few districts and the Central Office. Each district office also contained a 3/4" videotape player/recorder and a 19" monitor. These units were purchased more than five years ago and have limited capabilities. Recently, all District Traffic Engineers were equipped with 1/2" camcorders to aid in the retrieval of traffic data. This purchase was coordinated by the Video Task Group and was financed with a Division of Motor Vehicles safety grant. The purchase was coincidental to the task group's evaluation of how the five-year old equipment was being used and an assessment of what the Department's capabilities should be with respect to video technology. This report presents the results of that evaluation and assessment.

PURPOSE AND SCOPE

The primary purpose of the study was to determine the uses for, benefits of, and costs associated with videotape productions in the daily operations of the Virginia Department of Transportation. The entire effort was coordinated by the aforementioned interagency task group. That group established the following as its objectives.

1. A determination of the application the Department now has or will have in the future for video technology in its daily operations.

2. An itemization of the specific equipment required to achieve the application determined in item 1.
3. An estimation of the cost of the equipment determined in item 2, and a recommended program for the purchase of this equipment.
4. A determination of the cost effectiveness of video technology to the Department.
5. A determination of the human resource needs and skills required to operate the equipment.
6. The development of an operation and control methodology for the video system if purchased.

The study was initiated in August 1985, and the task group ended its deliberations in December 1986.

METHODOLOGY

The task group utilized various approaches to obtain the information and data necessary to fulfill the objectives of the study. The group was broken down into three subcommittees to explore three specific areas. Specifically, The Training & Information Subcommittee was charged with ascertaining how videotape could be used in the Department's information dissemination and training efforts; the Needs Subcommittee was assigned to determine the video needs and uses of the residencies, district offices, and Central Office Divisions. The Equipment Subcommittee was assigned to evaluate equipment specifications and to attempt to match specific equipment to the Department's needs.

Each Central Office Division and District Office was requested to submit ideas as to how it could use videotape technology in its daily operations and the benefits that would accrue from that use. Each unit was also asked to list and provide justification for video equipment needs by quantity, type, and anticipated uses. The Equipment Subcommittee was the recipient of this latter information along with that received from video vendors. Several vendors were visited so that equipment could be observed in service; many others were contacted by mail and telephone to obtain information regarding the serviceability, versatility, and performance of various pieces of video equipment.

At the suggestion of one of the members of the task group, the Research Council conducted an investigation of how video technology is being used in the transportation industry nationwide. This study included a search of the literature available on the subject as well as a survey of each of the nation's state transportation agencies. The report from that study has been published and is entitled "An Investigation of the Uses of Videotape in Transportation Operations." It contains an overview of the various ways videotape is being used in 41 transportation agencies as well as an annotated bibliography of publications on videotape applications.

The task group reviewed videotapes representative of various transportation applications that were received both from vendors and other transportation agencies. Other state agencies currently utilizing video technology were also contacted and asked to supply information regarding equipment, personnel needs, and videotape applications.

During the study, the task group met six times to discuss, disseminate, and synthesize the accumulated information. In addition, several supplemental meetings were held by the task group subcommittees. This report is divided into two sections: (1) a synopsis of the benefits of and uses for videotape in the Department and (2) a review of equipment needs, associated costs, equipment assignment, and personnel needs. This latter section also includes subsections on editing, equipment delivery, follow up, and training.

POTENTIAL USES FOR AND BENEFITS OF VIDEOTAPE TECHNOLOGY

In order to determine the potential uses for videotape technology throughout the Department, each task group member was requested to contact a specified group of Central Office divisions or district field units to ascertain the anticipated video needs of each. Representatives from those units were asked to supply both current and anticipated uses for videotape along with a statement as to how these uses would benefit the Department. To gain management perspective, each district engineer and division administrator was asked to submit similar information. Input was received from all divisions, all district offices, and several residency offices.

As expected, the information received showed that the applications for videotape in the Department's operations are endless. First and foremost, videotape appears to have limitless application in the training area. How-to programs exist by the hundreds, and the Department could produce hundreds more for its own uses. Taped materials could be prepared to explain how to repair, operate, and maintain various pieces of Department-owned equipment; how to perform various maintenance and materials test activities; and how to handle hazardous waste materials clean up, bridge erection, the application of pesticides, and other similar activities. Instructional materials could be prepared on bridge and road construction procedures, safety programs, good housekeeping programs, inspection procedures, and certification programs. In addition, technical presentations and portions of seminars, workshops, and meetings can be taped and used for instructional purposes. These videotapes would be used by individuals or small groups of employees prior to the initiation of certain tasks to enhance their knowledge, skills, and abilities.

The availability of equipment through the Department to produce and play back videotape would enable employees who were unable to attend certain meetings or group discussions to avail themselves of the information. Secondary benefits that would accrue to the Department, aside from the learning experience, would be a reduction in employee time away from the job as well as avoidance of the travel costs to attend the sessions. Even though it is often impossible to draw individuals from all parts of the Commonwealth to view a demonstration of equipment in operation or materials being used on a project, videotapes would make these operations

and materials accessible to scores of Department personnel without the need for them to travel.

There is also a great deal of interest among certain Department staff and FHWA Division Office representatives in the benefits that can be realized from videologging some or all of Virginia's highway systems. Videologging is simply a method for making videotape recordings of a highway corridor. Nine state transportation agencies presently use this procedure for cataloging some or all of their respective highway systems, and nine more are planning to use it in the near future. Videologs have proved quite useful to both Central Office divisions and field offices in state transportation agencies around the country by providing a permanent record of road structures and appurtenances. In addition, they are extremely useful for reviewing accident sites, maintenance problems, pavement conditions, and sign inventories. Videologging helps to minimize field trips; is an easy way to collect data; and the data are easy to store. Voice recordings can be added to the videologs either in the field or at a later time, and the videotapes can be interfaced with a microcomputer to allow computerized inventories. It is the feeling of the task group that videologging should be explored further by the Department. Neither a discussion or or evaluation of the specialized equipment necessary to produce videologs is included in this report; that evaluation should be a part of a further exploration of the technique.

The task group also determined that there is a potential for videotape use in field or laboratory documentation and demonstration, including before-and-after studies. Videotape would be invaluable as a means of providing documentation relative to disputed claims on construction projects; environmental concerns; riverbank conditions; water sheds; drainage easements; accident damage to roadways, structures, and vehicles; storm damage; right-of-way appraisals; tort liability issues; and before-and-after studies of property development and entrance locations. Furthermore, as work progresses on a bridge, road construction project, or tunnel, a record of this progress can be made with a video camera. Such tapes have myriad uses for training, employee orientations, departmental overviews and historical applications.

There are a number of general activities throughout the Department in which the use of video technology could assist managers in making certain decisions. These activities include bridge maintenance, tunnel inspection, inspection in-depth review, project design, through truck restriction, urban area studies, conflict analysis, turning movements, traffic congestion, traffic counts, ramp metering, and speed-zone review and monitoring. The videotaping of these and other field activities would enable managers to review problem areas, analyze various characteristics at intersections and on roadways, and thus make some decisions without making a field trip.

It is in the area of public relations that video technology can probably offer the greatest benefit to the Department. The medium provides an excellent means for providing news releases, public service announcements, and other types of informative programs about the Department's activities to the public. Furthermore, videotape could be used by the Commissioner and senior staff to advise, instruct, demonstrate, and present major issues to various groups of the Department's personnel statewide. Employee

briefings, orientation, and other personnel programs could be shown to the staff on videotape. Videotape programs could be produced for governing bodies and public groups throughout the Commonwealth. The medium could also be used both as an enhancement to presentations made at public hearings and to record these proceedings.

Finally, there is the question of savings in expenditures. The task group has estimated that the annual potential savings that can be realized as a result of the Department's extensive use of videotape technology could be as much as \$357,000. These savings will be accrued through the elimination of scores of trips by field and Central Office staff to review on-site problems. Savings will also result from the elimination of the need to transport groups of employees long distances for training purposes. Mileage, labor, and room and board expenditures can thus be reduced, not to mention the savings that might result from the improved knowledge, skills, and abilities of those employees receiving training at their work site.

In summary, videotape is viewed by Department managers and staff as a tool they can use to become more efficient and productive. Its uses and benefits to our Department are endless. It is a viable means of distributing all kinds of information to users both inside and outside the Department, and it offers a cost-effective means for documenting the Department's activities, providing training, and communicating with the public.

VIDEO PRODUCTION EQUIPMENT ASSESSMENT

General Discussion of Equipment

The Equipment Subcommittee assigned to review equipment needs made use of several resources in its review. Vital information was gleaned from the knowledge and experiences of the subcommittee members themselves. Calls and visits were made to manufacturers and dealer representatives to obtain literature and technical information. The subcommittee attended several hands-on demonstrations by video equipment vendors. These demonstrations included all components the subcommittee felt would be essential to a total video system.

The subcommittee first addressed the question of what the equipment needed to do. A basic video recording system consists of (1) a video camera, (2) a video recorder, (3) a video playback unit, and (4) a monitor/receiver/television. Items 2 and 3 are generally combined to become a video player/recorder. A review of information received from the district and residency offices revealed that there is a need for these components throughout the Department. The committee evaluated several alternative configurations and determined that a compact, portable, lightweight recording system would best serve the purpose of the Department. A 1/2" VHS combination camera and recorder, called the camcorder will serve these functions well. These units equipped with a quality lens, automatic focus, zoom, microphone, battery power system, and tripod will accomplish most of the recording and documentation needs of both the field and Central Office staff.

A camera superior to that of the camcorder will be necessary for preparing broadcast quality tape for distribution to television stations, for use in preparing training programs, and for other needs requiring multiple copying. The subcommittee evaluated two videotape formats that can be used for this type of service -- the 1/2" Betacam format and the 3/4" Umatic format. The quality of the Betacam format exceeds that of the 3/4" Umatic, but the expense of the Betacam format, in the opinion of the subcommittee, far outweighs this difference. An editing system to accommodate the Betacam format would be more than twice that for the 3/4" system, not to mention the substantial difference in the cost of cameras and recorders of the former over the latter. The Department should procure a quantity of industrial grade three-tube color cameras equipped with a quality lens, battery power system and tripod with fluid head and dolly. Each camera should also be equipped with a 3/4" portable video cassette recorder. It should be emphasized that the three-tube cameras and 3/4" portable videocassette recorder would be used primarily for productions for broadcast and external consumption, and should not be thought of as being at all similar to the camcorders discussed in the preceding paragraph.

The third component of the video system is the monitor or receiver or television screen on which programs are viewed. Presently, each district office contains a 19" monitor. Based on input from the field, the equipment subcommittee feels monitors are also necessary in the residency offices. The video industry produces a combination videocassette player/receiver monitor that should serve this purpose well. The unit is fairly portable and could be easily transported from the residency to the district offices and vice versa, from residency offices to the smaller field units, and between divisions within the Central Office. A quantity of these units should also be distributed among certain Central Office Divisions. They have a 13" screen and are thus quite suitable for viewing by 1 to 10 persons. A larger screen is not available in a unit of this type. The task group was alerted to the fact that at the residency level, there will be occasions when more than 10 persons will assemble to view a particular videotape program; consequently, a 13" screen will not be sufficient for these applications. If this tends to be a frequent occurrence, one of the following options could be exercised: either programs could be shown twice to two separate groups, or a 19" monitor that would piggyback onto the combination units could be purchased for each residency office. The Follow-Up Committee (see recommendation 6) will monitor these occurrences and make appropriate recommendations in its report.

At times, videotaped programs will need to be viewed by larger audiences. The subcommittee evaluated the need for a video projection system for this purpose. This system projects the videotape image on a 72" diagonal screen, which can be viewed by 50 or more persons in a semi-darkened room. The system is portable and can be mounted in the ceiling, or on a table, or it can be used for rear projection. The subcommittee reported that such a system would be most useful and should be installed in all of the Department's auditoriums.

It was the goal of the equipment subcommittee to determine what equipment was necessary for all units of the Department to be able to use videotape to some degree. In addition to those items discussed in the preceding paragraphs, the subcommittee reported that each district should

be equipped with a 1/2" VHS videocassette recorder to enable staff to playback prerecorded videotapes. It also recommended that the Central Office third-floor conference room be equipped so that both 3/4" and 1/2" videotapes can be viewed. Finally, it recommended that the state aircraft be equipped with a camera, recorder, monitor, and a special stabilizing lens to enable it to shoot videotape footage from the air.

The procurement of various quantities of the aforementioned items will equip the Department's staff with the basic portable and stationary video components necessary to produce quality programs for field and in-house use. It will allow programs to be viewed by 1 to 150 persons at a time, and will equip the Department to produce broadcast quality programs for public consumption. All in all, it will provide the Department with video versatility in that the system will have virtually no limitations. The video task group therefore feels the following items should comprise the video production system for the entire Department.

- Portable 1/2" VHS Camcorders with tripod
- Portable integrated 13" combination color monitor/VCR
- 1/2" VHS Player/recorder
- 3/4" VHS player/recorder
- Video projection system
- Monitors - 7", 19", 25"
- Camera system - 3 tube, 3/4"
- Portable 3/4" videocassette recorder
- Tripod with fluid head
- Gyroscopic stabilizing camera lens
- Editing system for 1/2" and 3/4" videotape

Quantity, Assignment, and Cost

Tables 1 and 2 provide a summary of the suggested locations and costs of various quantities of the equipment that is to comprise the Department's video system. This array was derived from the justifications received from the Department's managers and staff as well as information obtained from video vendors. The task group offers the configuration contained in the tables for consideration. These tables differ only in the type of editing systems proposed. Table 1 calls for an SP editing system and Table 2 proposes an industrial editing system. A brief discussion of the justification for both configurations follows.

Table 1

Proposed Video Equipment, Quantity, Assignment and Cost
SP System

CODE NO.	DESCRIPTION														UNIT COST
[1]	Camcorder 1/2" VHS w/ tripod, microphone & battery														\$1,600.00
[2]	Combination player viewer 1/2" VHS VCR w/ 13" monitor														\$1,100.00
[3]	1/2" VHS video cassette player recorder														\$1,000.00
[4]	3/4" VHS video cassette player recorder														\$2,000.00
[5]	Video projection system														\$4,500.00
[6]	19" color monitor														\$0.00
[7]	25" color monitor														\$700.00
[8]	Camera system 3 tube w/ tripod and fluid head														\$8,900.00
[9]	Editing system for 1/2" and 3/4" video programs (SP format)														\$135,000.00
[10]	Enclosure for player viewer														\$500.00
[11]	3/4" portable VHS video cassette player recorder														\$3,650.00
[13]	17" color monitor														\$200.00
[14]	Gyroscopic stabilizing lens														\$12,000.00
DIST./DIV.	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[13]	[14]	Totals	
Districts	9	18	18	0	9	0	0	0	0	0	0	0	0	\$92,700.00	
Residencies		45												\$49,500.00	
Administrative Services														\$0.00	
Bridge		1												\$1,100.00	
Budget														\$0.00	
Construction		1												\$1,100.00	
Environmental														\$0.00	
Equipment	1	1	1				1			1				\$4,900.00	
Fiscal														\$0.00	
Traffic Engineering		1												\$1,100.00	
Public Affairs A.V. Sect								2	1		2	0	0	\$160,100.00	
Information Systems														\$0.00	
Internal Audit														\$0.00	
Location & Design		1												\$1,100.00	
Maintenance		1												\$1,100.00	
Management Services		1												\$1,100.00	
Materials	1	1	1				1			1				\$4,900.00	
Personnel [training]	6	2	1		1									\$17,300.00	
Programming & Scheduling														\$0.00	
Rail & Public Trans.														\$0.00	
Research Council	1	1	1		1									\$8,200.00	
Right of Way		1												\$1,100.00	
Secondary Roads														\$0.00	
Rich. Petersburg Tpk.	1	1												\$2,700.00	
Transportation Planning		1												\$1,100.00	
Urban														\$0.00	
Conference Room 3rd. fl.		1	1	1			1			1				\$5,300.00	
Personnel (benefits)		1												\$1,100.00	
Auditorium (C. O.)			1		1									\$5,500.00	
Airplane											1	1	1	\$15,850.00	
Tunnel & Toll Suffolk		1												\$1,100.00	
Totals	19	80	24	1	12	0	3	2	1	3	3	1	1	\$377,950.00	

NOTE: Public Affairs equipment includes industrial cameras and SP format editing system

Table 2

Proposed Video Equipment, Quantity, Assignment and Cost
Industrial System

CODE NO.	DESCRIPTION														UNIT COST
[1]	Camcorder 1/2" VHS w/ tripod, microphone & battery														\$1,600.00
[2]	Combination player viewer 1/2" VHS VCR w/ 13" monitor														\$1,100.00
[3]	1/2" VHS video cassette player recorder														\$1,000.00
[4]	3/4" VHS video cassette player recorder														\$2,000.00
[5]	Video projection system														\$4,500.00
[6]	19" color monitor														\$0.00
[7]	25" color monitor														\$700.00
[8]	Camera system 3 tube w/ tripod and fluid head														\$8,900.00
[9]	Editing system for 1/2" and 3/4" video programs (industrial format)														\$111,000.00
[10]	Enclosure for player viewer														\$500.00
[11]	3/4" portable VHS video cassette player recorder														\$3,650.00
[13]	17" color monitor														\$200.00
[14]	Gyroscopic stabilizing lens														\$12,000.00
DIST./DIV.	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[13]	[14]	Totals	
Districts	9	18	18	0	9	0	0	0	0	0	0	0	0	\$92,700.00	
Residencies		45												\$49,500.00	
Administrative Services														\$0.00	
Bridge		1												\$1,100.00	
Budget														\$0.00	
Construction		1												\$1,100.00	
Environmental														\$0.00	
Equipment	1	1	1				1			1				\$4,900.00	
Fiscal														\$0.00	
Traffic Engineering		1												\$1,100.00	
Public Affairs A.V. Sect								2	1		2	0	0	\$136,100.00	
Information Systems														\$0.00	
Internal Audit														\$0.00	
Location & Design		1												\$1,100.00	
Maintenance		1												\$1,100.00	
Management Services		1												\$1,100.00	
Materials	1	1	1				1			1				\$4,900.00	
Personnel [training]	6	2	1		1									\$17,300.00	
Programming & Scheduling														\$0.00	
Rail & Public Trans.														\$0.00	
Research Council	1	1	1		1									\$8,200.00	
Right of Way		1												\$1,100.00	
Secondary Roads														\$0.00	
Rich. Petersburg Tpk.	1	1												\$2,700.00	
Transportation Planning		1												\$1,100.00	
Urban														\$0.00	
Conference Room 3rd. fl.		1	1	1			1			1				\$5,300.00	
Personnel (benefits)		1												\$1,100.00	
Auditorium (C. O.)			1		1									\$5,500.00	
Airplane											1	1	1	\$15,850.00	
Tunnel & Toll Suffolk		1												\$1,100.00	
Totals	19	80	24	1	12	0	3	2	1	3	3	1	1	\$353,950.00	

NOTE: Public Affairs equipment includes industrial cameras and industrial format editing system

Equipment Justification

- (1) Camcorders: Nineteen portable 1/2" camcorders with accessories to include battery pack, microphone, and tripod should be assigned as follows: one per district office, one to the Richmond-Petersburg Turnpike facilities, one each to the Equipment, Materials, and Research Divisions and six to the Central Office Personnel and Training Section. These six camcorders would be considered "pool cameras" to be used by all Central Office Divisions. It should be noted that one camcorder has already been placed in each of the nine district offices and assigned to the district traffic engineers.
- (2) Combination monitor/VCRs: Because of their portability, these units will be quite useful to the field as well as the Central Office Divisions for the viewing of videotape programs by from 1 to 10 individuals. It is recommended that two units be placed in each district, one in each residency, and the remainder in the locations specified in Tables 1 and 2.
- (3) 1/2" VHS videocassette player/recorder: Since most videotape programs received by the Department will be on 1/2" videotape and since the cameras recommended for use in the field will produce 1/2" videotapes, it is recommended that each district office, the outlying divisions (Materials, Equipment and Research), the Central Office auditorium and the third-floor conference room be equipped with 1/2" videotape machines. In the district offices and at the Research Council, this unit will be the one used to operate the video projection system discussed in item 5.
- (4) 3/4" Videocassette player/recorder: According to information received by the task group, all districts, outlying divisions, and the personnel and training sections contain units which enable them to view programs received on 3/4" tape. Since this format is currently in place throughout the Department, and since many prerecorded programs are received on 3/4" videotapes, it is recommended that the 3rd floor conference room be equipped with a 3/4" videotape player/recorder.
- (5) Video projection system: It is recommended that a video projection system be installed in each district office auditorium, the Research Council auditorium, and the Central Office auditorium. These units will enable groups of 50 or more to view videotape programs. It is also recommended that an additional video projection system be located in the personnel and training section to enable the staff to present the Department's programs to large groups in other facilities, such as hotels, schools, and other agencies.
- (6) 25" Color monitors: To enable groups of 15 to 30 individuals to view videotape programs, it is recommended that the Equipment and Materials Divisions each receive a 25" monitor. It is also recommended that a 25" monitor be placed in the 3rd floor conference room.

- (7) Three-tube video camera: There is a need for two three-tube camera systems to enable the Department to produce videotape programs of broadcast quality. These systems should include all lenses, battery equipment, chargers, and tripods with fluid heads and dollies, and should be assigned to the Audiovisual Services Section of the Public Affairs Office. The three-tube camera will also be used by the Location and Design Division for shooting from the state aircraft.
- (8) Editing system for 1/2" and 3/4" videotape programs: See section on post production. This equipment should be assigned to the Audiovisual Services Section of the Public Affairs Office.
- (9) Enclosures for VCRs and 25" monitor: These enclosures are necessary to house the videocassette recorders and 25" monitors, which will be located in the Equipment and Materials Divisions and the Central Office 3rd Floor conference room.
- (10) Portable 3/4" videocassette recorder: These recorders are necessary for use with the three-tube video cameras discussed in item 7 above. It is recommended that three units be purchased. Two should be located in the Audio Visual Services Section and one should be permanently mounted in the state aircraft.
- (11&12) 7" Color monitor and gyroscopic stabilizing lens: These items will be used primarily in the state aircraft. The 7" monitor will allow the camera operator to view footage both during and immediately after it is shot. The gyroscopic lens is necessary to remove the motion generated by the airplane. If this lens is not used, much of the videotape footage will not be usable. It should also be noted that this lens/camera configuration will also be useful in eliminating the motion generated on videotape shot from a moving vehicle.

Post Production Equipment - The Editing Suite

The edit system is essential to enabling the Department to produce quality videotape programs. Such programs might include informative programs for public consumption, videotape programs for internal use, and training programs. Videotape is a powerful communications tool that needs a good edit system to be effective. We are accustomed to good video programs because we have watched television for over 30 years. Thus, in order for a videotape program to be effective, it must meet the standards of the typical television viewer. Videotape programs will not capture viewer attention if they are lower in production quality than television programming. Capturing and maintaining the viewer's attention is the measure of success of any videotape program. The goal, then, of videotaped programs is communication and the key to good video communication is professional broadcast quality editing equipment. The task group feels it is essential that the Department purchase an edit system capable of producing a broadcast quality signal that meets FCC standards. This is necessary if a television station is expected to use the material. Two alternative editing configurations are presented in Table 3. The task group members had the opportunity to compare the two formats. The "SP" broadcast editing

system is of superior quality but is 20% higher in cost than the industrial editing system. Although the task group feels either system will provide the Department with top-notch video editing capability, the quality of the SP system is sufficiently greater than the industrial system to warrant the purchase of the former over the latter. It should be pointed out that the cost differential is approximately 7% of the total proposed system cost.

Table 3

Alternative Editing Configurations

<u>Broadcast Edit System</u>	<u>Industrial Edit System</u>
SP videotape recorders	Industrial videotape recorders
VTR edit controller	VTR edit controller
Video monitoring equipment	Video monitoring equipment
Character Generator	Character Generator
Audio equipment	Audio equipment
Sync System	Sync System
Audio distribution	Audio distribution
Console and Racks	Console and Racks
Approximate cost - \$135,000.00	Approximate Cost - \$111,000.00

One alternative to the purchase of editing equipment is the use of existing editing systems throughout the Commonwealth on a borrow or rent basis. The task group feels this alternative is not advisable for several reasons. First, on the average, it takes an experienced video editor approximately one hour to edit one minute of videotape. Thus, a 30-minute training program could take over 30 hours to edit. Agencies containing editing systems are generally unwilling to supply this amount of time for an outside agency to use its equipment. An agency possessing in-house editing capability is generally kept busy by its own internal requests, thus outside work will be given low priority. Also, each video edit system is unique, so that compatibility between needs and capabilities can be a problem. Finally, experience has shown which agencies which are edit capable are generally not willing to tie up their personnel to do the work of another agency. Consequently, the task group strongly feels the purchase of an editing system is warranted.

Cost

It is estimated that the equipment discussed in the preceding section can be procured for between \$354,000 and \$378,000, depending on which editing system is purchased. The administrative-unit cost, exclusive of the editing system, is shown in Table 4. The district average includes the 45 combination VCR/monitor units that are to be placed in the residencies. It should be mentioned that the average division expenditure does not include that earmarked to equip the state aircraft nor that for public affairs, which is to include the broadcast quality cameras and the edit system. It should also be noted that the six camcorders allotted to the Personnel and Training section are to be available for use by all divisions.

Table 4

Average Video Equipment Expenditure by
Administrative Unit

<u>Unit</u>	<u>Average Expenditure</u>
District	\$15,800*
Residency	1,100
Division	2,668
Conference & Auditorium	5,400

*includes residency equipment

Financing the Video System

The task group recognizes that there are certain financial factors that must be addressed should this project be approved as recommended. The following proposals for procurement are therefore offered.

Purchase Option A

This option calls for the purchase of the entire system, including the editing equipment, simultaneously. As mentioned earlier, this expenditure will depend on which editing system is purchased. Simultaneous purchase would assure equipment commonality, uniformity, and interface capability. The potential for securing a maintenance contract would also be enhanced. In addition, the fact that fewer manufacturer and dealer representatives might be involved with this type of purchase plan may result in fewer technical questions, a greater understanding of the capabilities and technical aspects of the system, and closer interaction with the supplier.

Purchase Option B

Should funding not be available to purchase all of the equipment at once the task group suggests that all components exclusive of the editing system be purchased first. This expenditure would be approximately \$243,000. Once this equipment is in place and operating smoothly, the procurement and installation of the editing system should follow. The cost of the editing system will be \$111,000 to \$135,000.

From the task group's perspective, it appears that either of the above purchase options is workable. However, if funding is available to procure the entire system simultaneously, the task group strongly recommends purchase option A.

Procurement Procedures

Approval of this project will require that a committee be appointed to develop specifications for the purchase of each item. These specifications must assure that the components of the video system interface with one another. It should be pointed out that although many of the video equipment items are on contract, purchase on one procurement order will help

assure the compatibility of all components. Accordingly, the task group recommends that the aforementioned Subcommittee on Equipment be assigned this responsibility. The members of the subcommittee are Aubrey Baird, Ms. Lou Hinshelwood, W. T. Heath, Jr., Jim Melone and Mike Perfater.

It is recommended that all equipment purchased for assignment to the district and residency offices and the Central Office divisions be shipped to the Central Office training section. The procurement should include a two- or three-day training session provided by the supplier(s) or other qualified video professionals to be administered to the district and Central Office Training Officers. It should then be the responsibility of the Training Officers to train all Department staff in the care and use of the video equipment. It is further suggested that district and Central Office training staff be responsible for recording the location of all components of the system and maintaining records of equipment use.

Personnel and Staffing

The video task group is fully confident that most of the video equipment requested for general use within the Department's Central and field offices will be easily operable by most staff once they are trained in its use. It is important, however, that a specially trained staff be employed to operate the broadcast quality cameras and the editing system. There are three potential areas of expertise in the operation of these more specialized components: (1) director, (2) script writer, and (3) editor assembler. A director must be able to visualize a program before production begins. He/she must be able to coordinate the behind-the-scenes production staff, assemble the necessary equipment, and direct the characters in conjunction with the script. There will also be a need for a script writer to prepare narration to accompany videotape programs. The task group feels this employee may be available within the Department. For complex situations, such as a specialized training tape, the Department might choose to employ script writers on a case-by-case basis. An editor assembler will be required to operate the editing production suite. Since this activity requires specialized talent, the task group feels the Department will likely have to procure this individual from the outside job market. It is quite possible that all three of the aforementioned functions could be accomplished by the same individual. It should be stressed that it is the talent that is essential, not necessarily numbers of individuals. The future of the production unit will depend upon the knowledge, skills, and abilities of the individuals possessing these three areas of expertise. The task group is willing to work with the Public Affairs Division in securing and developing employees to carry out these tasks.

Follow Up

The task group believes a committee should be established to track the usage and assignment of the recommended video equipment array. It is suggested that this committee be comprised of Jim Melone, Mike Perfater, W. T. Heath, Ann Smoot, and two district training officers. It will be the responsibility of this committee to point out shortcomings, misappropriations, additional equipment needs, and any successes or failures that may occur. The committee should submit a written report on the status of the Department's video operations 12 months after the equipment is "up and running" To aid in the accomplishment of this objective, the district training officers and the Central Office Training Section must maintain operation records for all units of equipment and record or document any comments or suggestions made for improving the operation of the entire system or any component of it.

Location of Videotape Library and Supplies

It is essential that the Department establish a videotape library to house copies of those videotapes produced for the public and Department-wide consumption. The library should be maintained by the Public Affairs Division. A duplicate set of videotapes should be located at the Virginia Transportation Research Council's Rural Transportation Assistance Program Center in Charlottesville. Also, it is recommended that all supplies and accessories including blank tapes, lighting, batteries, labels, etc., be purchased by the Department's Administrative Services Division. These supplies should be distributed to each district headquarters stockroom.

SUMMATION AND RECOMMENDATIONS

The task group on videototechnology has endeavored to present a detailed overview of its investigation of the potential uses of videotape in the Department's operations. This report outlines how the task group went about completing its assignment and what the results were. It is the belief of the entire group that the Department needs to become video-capable: the uses for videotape programs both within and outside the Department are limitless. The benefits far outweigh the costs in the long term. During its endeavors to assess the uses and benefits of videototechnology in the Department's operations, the task group learned that this sentiment is also shared by a large majority of managers and professional, technical, and secretarial staff in the field and in the Central Office. The predominant staff response regarding the procurement of video equipment was not an "if" but a "when." It is the judgment of the task group that the "when" is now. Therefore, based on the findings presented in this report, the task group offers the following recommendations.

1. It is recommended that the video equipment listed in Table 1 of this report employing Purchase Option A be procured by the Department and placed in the respective locations designated. In the event that it is determined that the purchase be staged, it is recommended that purchase option B be exercised, which specifies that all components

exclusive of the editing system be purchased first followed by purchase of the editing system.

2. It is recommended that the equipment that is purchased be the responsibility of the following Department staff. All equipment located in the Central Office shall be the responsibility of the Training Section with the exception of the editing equipment, which should be the responsibility of the Audiovisual Section of the Public Affairs Division. All production for public and media consumption should be the responsibility of the Audiovisual Services Section of the Public Affairs Division. All video equipment located in the districts should be the responsibility of the district training officers with the exception of the camcorders assigned to each district traffic engineer. Video equipment located at the Research Council should be the responsibility of the audiovisual section there.
3. It is recommended that a committee be established to write the specifications for the equipment recommended for purchase in Item 1. This committee should include, but not be limited to, the following members of Task Group's Equipment Subcommittee: Aubrey Baird, Lou Hinshelwood, W. T. Heath, Jr., Jim Melone, and Mike Perfater.
4. It is recommended that all videotape equipment purchased be received in the Central Office, and that vendor training in the use of said equipment be administered to the district and Central Office training staff as well as specific staff from the Audiovisual Services Section of the Public Affairs Division. The Training Staff will then be responsible for the training of other Department staff in the use of all equipment exclusive of that procured for editing purposes. It is further suggested that the district and Central Office Training staff also be responsible for recording the location of all components of the system and maintaining records of its use.
5. It is recommended that the Department obtain the expertise of a director, script writer, and editor assembler to oversee and operate the video editing suite for the Public Affairs Division. Although it is felt that script writer talent may be available within the Department, the director and the editor assembler talent may have to be procured from the outside job market. It is probable that two or three of these functions could be accomplished by the same individual. It should be stressed that it is talent that is essential.
6. It is recommended that a follow-up committee be established to track the usage, successes, failures, etc., of the video equipment. This committee should be comprised of Jim Melone, Mike Perfater, W. T. Heath, Jr., Ann Smoot and two district training officers. It should have a life of 12 to 18 months and should be responsible for pointing out shortcomings, misappropriations, the need additional equipment, and successes or failures that occur. The committee should present a written report on the status of the Department's video operations one year after the system is "up and running."
7. It is recommended that the Department establish a videotape library to house copies of videotaped programs produced for public and

interdepartmental consumption. It is envisioned that this library will contain both copies of tapes produced in-house and those received from other sources. It is suggested that this library be maintained by the Public Affairs Division. A duplicate set of videotapes should be located in the Virginia Transportation Research Council's Rural Transportation Assistance Program Center.

8. It is recommended that all supplies and accessories, including blank videotapes, lighting, labels, blank audiotapes, containers, batteries, and the like be purchased by the department's Administrative Services Division. These supplies should then be distributed to each district headquarters stockroom.
9. It is recommended that the Department investigate videologging. This investigation should include an examination of the uses and benefits of videologging as well as an evaluation of the equipment necessary to produce videologs.