TELECOMMUNICATIONS:

A NEW

VIRGINIA INITIATIVE

THE REPORT OF THE

TELECOMMUNICATIONS STUDY COMMISSION

TO

THE GOVERNOR

AND

THE GENERAL ASSEMBLY OF VIRGINIA

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TELECOMMUNICATIONS: A NEW VIRGINIA INITIATIVE

A program evaluation and organization study of a major state government function is a complex activity. This study was conducted over 15 calendar months and utilized 35 man months of staff effort. In addition, many hours of assistance was provided by over 250 government and private agency experts.

The Commonwealth's interests in telecommunications are wideranging and comprehensive. Telecommunications technologies are a part of the day-to-day activity of all of state government programs and services. From the ubiquitous telephone - a part of the background of every state office, shop, or laboratory - to sophisticated in-car radio systems, to television production studios or experimental two-way long distance teaching experimental programs, telecommunications has become part of the warp and woof of state government in Virginia. The report on Telecommunications: A New Virginia Initiative chronicles, at least in part, the Commonwealth's experiences in applying telecommunications technologies to its many and varied programs and service-delivery systems. This final Report of the Telecommunications Study Commission deals primarily with the decade of the 1970's.

The Telecommunications Study Commission, an eleven member legislative study commission, was established pursuant to law on April 8, 1978. Its mandate was to:

1. Evaluate the use and effectiveness of public telecommunications services in the Commonwealth;

2. Evaluate the existing State mechanism for allocating funds for public telecommunications facilities and services and for administering the Master Plan for Telecommunications with respect to public telecommunications facilities and services;

3. Make recommendations as to the most cost effective use of public telecommunications in the Commonwealth;

4. Make recommendations as to the proper location for the administration of State programs related to public telecommunications and for the continued evaluation of State programs related to public telecommunications; and

5. Advise the Virginia Public Telecommunications Council as to any revisions or modifications of the Master Plan for Telecommunications as they may relate to telecommunications and on other matters which may relate to the use of telecommunications facilities, services or programs in the Commonwealth.

This five-part charge describes a comprehensive program evaluation of the effectiveness of a major portion of the State's overall information transfer and service delivery commitments. The focus of the study and the findings uncovered through our searches confirm this mandate and accentuate the recommendations contained herein.

Telecommunications technology has evolved rapidly in the past few years. Spurred by the national space program nationally and evolving from previous telephone, television, computer data transmission and radio technologies, we are, today, presented with a communications potential of tremendous magnitude for not only moving information (voice, video and digital signals) but of revolutionizing the conduct of the State's business. Indeed, it is in this area of facilitating the delivery of important programs and services that telecommunications holds its greatest promise.

The findings of the Telecommunications Study Commission center on telecommunications policy and management. While specific recommendations for future action are presented, they are couched in terms of a policy stance the Commonwealth might take and of an overall management approach useful to proper integration of these technologies into the routine operations of government management.

Thirty-six recommendations are contained in this Final Report. Each one is intended to direct attention to a needed shift in focus or change in relationships among state officials. All are intended

to center more on effective use of telecommunications systems and to sharpen the management potential of those charged with oversight of telecommunications components.

Conclusions

This report and the Working Papers upon which it is based describe many findings about telecommunications in Virginia. Among these findings the following are felt to be of prime significance:

1. Existing telecommunications systems in the Commonwealth are generally individual and autonomous in nature. There is little comprehensive statewide management, coordination or oversight.

2. There are rapidly increasing needs for new and additional telecommunications services in State agencies and institutions.

3. The technology and uses of telecommunications are changing, especially in the computer area. The technologies of voice and data transmission are merging and alternatives to direct radio or television broadcasting are now available.

4. Constraints are imposed upon the development of total Telecommunications systems due to the lack of a Statewide perspective on the system management and planning. Maximum efficiencies and economies are not being realized as a result.

5. Current staff and expertise levels in VPTC are inadequate to perform either legislated or operational needs mandates.

6. Some use is being made of telecommunications technologies to assist agencies/institutions to provide governmental services; more use for this purpose is indicated.

7. The variety and complexity of technologies argue for a sepcific program of research and demonstration of specific application and a concerted program of promotion of cost beneficial applications beyond that attempted in the past.

8. Continuous comprehensive planning is needed to insure that changes are fully considered by agencies and institutions.

9. The Virginia Public Telecommunications Council's special focus on public television has helped insure the development, operation, and growth of that medium. This focus on public television has precluded attention to other major telecommunications systems.

10. Expenditures for all telecommunications uses exceed $50 million annually. Some evidence exists that savings are potentially available through statewide coordination and planning.

Virginia is still in the early stages of developing interagency telecommunications planning and management. The prospects for more effective cost-beneficial service delivery programs through the full use of telecommunications is good, but, action should be taken to:

1. Establish adequate statewide telecommunications management and coordination.

2. Reorganize to:

   a. make public broadcast oversight the specific concern of a citizen body.

   b. place responsibility specifically for telecommunications planning and policy, and

   c. assign staff to manage and coordinate telecommunications systems, networks, equipment specifications, and operational efficiencies.

3. Provide a Statewide telecommunications plan on a total system basis coordinating all government requirements and update on a continuing basis.

Policy Recommendations

All of the recommendations contained in this report represent policy proposals. Several specific telecommunications policies are included in this summary as background for implementation.

Telecommunications

It is recommended that the State adopt a policy that encourages the proper application of telecommunications technologies to the solution of the state's service delivery problems. Perhaps at no other time in history has the need for innovative and creative approaches been present which can economically meet citizen demands for telecommunications services. Telecommunications systems and technologies now available can facilitate the delivery of major State programs economically. Analysis of these technologies and systems for possible application should be a matter of state policy.

There is a need to extend, as far as possible, telecommunications planning, management, coordination, control and use to all state agencies and institutions. Such a policy should encourage full use of telecommunications technologies by all state agencies and institutions of higher education. In addition, the state should explore the legal and operational feasibility of extending some telecommmunications systems capacity to appropriate units of local government.

Public Radio

State policy should support the development of public broadcasting including both public tv and public radio. The establishment of a financial mechanism for this support requires careful consideration of a variety of factors including the character of the local community to be served. For example, one policy factor is whether stations in rural communities with limited resources should recieve more assistance than stations in larger communities. The development of specific policy in this area is needed.

Public Broadcasting

The Commission recommends that a policy be clearly established and enunciated in such a manner that the General Assembly of Virginia declares that it is in the public interest of the Commonwealth to encourage and develop the growth of the four non-commercial educational public television station corporations. These stations have been developed with State assistance, and cover, to the extent possible, all areas of Virginia. In addition, public radio and television should also be assisted and supported because these services should be available to all citizens.

It is in the public interest to encourage such programming as will be responsive to the interests and needs of the people throughout the Commonwealth, both locally and Statewide, and which will constitute an expression of local initiative and excellence; that it is necessary and appropriate for the State government to complement, assist and support a policy that will most effectively make public television and, where feasible, radio service available to all of the people of the Commonwealth. This study suggests that an independent citizens' commission be utilized to facilitate this development and support of public broadcasting. Such an arrangement would afford maximum protection from extraneous interference and control, while facilitating and encouraging research and experimentation.

Organizational Recommendations

Several recommendations suggest a new organizational structure for the planning and management of telecommunications. Central to these recommendations is the belief that telecommunications decisions be made on at at least three levels:

1) - at the agency and institution of higher education level

2) - at the systems management and coordination (technical) level, and

3) - at the statewide planning and policy-making level.

Separate responsibilities and perspectives are inherent at each of the levels of organization.

Current law places responsibilities for at least the latter two levels of responsibility with the VPTC. While VPTC has a comprehensive mandate, its operation practices and budget affectively limit the scope of its responsibilities to public broadcasting, general coordination of telephones, and public instructional television activities. Except for telephone, little effective technical control or systems design and planning is undertaken.

This situation and the need to re-emphasize the benefits inherent in telecommunications technologies argue for change. From the discussion above, it is clear VPTC should be reconstituted to focus on public broadcasting policy and that other telecommunications responsibilities be assigned to a more appropriate agency.

This study recommends that the VPTC's name be changed to the Virginia Public Broadcasting Board and its functions be extended to the full range of public broadcasting (both radio and television).

In addition, the staff assigned now to provide support for the VPTC should be assigned to a new Department of Telecommunications (DTC). All day-to-day management and operational control should be transferred to the Department of Telecommunications as well as all planning, policy-making, promotion, and research and demonstration functions.

The Virginia Public Broadcasting Board (VPBB) should have full authority to utilize DTC staff expertise for planning and operations research. Staff assignments which affect public broadcasting issues should be directed and coordinated by the VPBB to insure that the State's interest and policy are fully reflected in all decisions. The New Department should function as staff of the VPBB.

In the paragraphs that follow, a brief summary of the specifics of the recommendations contained in this report are presented.

The Agency Level

Most decisions which affect the acquisition and use of telecommunications technology are made now by the State agencies and institutions. This study recommends that state agencies/institutions retain responsibility to determine individual needs, both for information transmission and service delivery concerns. Application of telecommunications equipment and systems to individual agency and institutional needs should remain the responsibility of the individual agency or institution. Assistance in the proper application of this technology, however, should be provided as needed by the new Department of Telecommunications.

Telecommunications Systems Management and Coordination

Fundamental responsibility for the day-to-day management control and coordination of telecommunications systems should be housed in one central organizational unit. This organization should have sufficient scope and authority to perform overall systems development and management. An important aspect of these recommendations is that legislation be drafted to create a Department of Telecommunications under the Secretary of Finance and Administration. This new department should be created from the staff of the existing Virginia Public Telecommunications Council and perhaps other State agencies. In addition, engineering expertise should be added to staff. Departmental responsibilities would extend to all technical, operational and day-to-day management concerns of State agencies and institutions. Provision should be made for the management and coordination of voice, data, radio, and other transmission systems.

The convergence of the technologies of voice and data transmission makes the organizational placement of these systems in a central telecommunications agency logical. A central organization could provide design standards and management policies to facilitate proper coordination and cost beneficial use of the state's investment in multi-agency telecommunications systems. Engineering, equipment specifications, network design, and other engineering and technological controls should also be lodged in this new department. State agencies already having these staff responsibilities could be relieved of systems design or operation responsibilities by this new central agency or should be required to coordinate their work with that of this new department.

The creation of a new central organization should not be interpreted to preclude the possibility that individual agencies would not continue to retain (or acquire) functional responsibility and staff

for the operation of a single agency telecommunications sub-system. Likewise, the operation of a sub-system of a larger state system could be assigned to a specific agency.

We recommend that the Department of Telecommunications acquire responsibility for an efficient and effective interconnection system, parts of which may be operated and/or maintained by specific state agencies, institutions, vendors or others.

The Department of Telecommunications would have the primary responsibility to provide statewide organization, operational planning, implementation, and management of telecommunications services. This organization would

a. be staffed with individuals having expertise in management and telecommunications technologies. This staff should be adequate to provide timely and comprehensive technical services.

b. provide timely expense data to users. This data should include details of specific surcharges and other costs associated with central Statewide management.

c. provide automated billing and collection procedures.

d. provide enforcement authority to assure maximization of the economies of scale that Statewide agencies can provide.

e. constitute a single point of contact between providers of telephone equipment and service and state agencies and institutions.

f. be responsible for developing and implementing a telecommunications information system to assist agencies and institutions in their management of their telecommunications systems. This information system should include inventory data, unit cost data, future projections of use, trends and related information.

g. provide user agencies with effective tools and information necessary for their effective use of this technology.

h. consolidate telecommunications equipment and services to the extent economics of scale dictate. Consolidation arrangements should be made only after review of all feasible technical alternatives and should employ only the demonstrably best technological alternative.

i. manage and coordinate the various telecommunications systems paid for by the Commonwealth.

j. provide expert guidance and control over the telecommunications systems operations and maintenance responsibilities (intended here is that guidance and control be exercised by this unit, but that direct operation and maintenance may be provided by others - that is, the common carriers, suppliers, or individual state agencies).

k. supervise vendor relationships.

l. develop criteria and standards for the purchase of equipment or other components of telecommunications systems or sub-systems.

m. approve equipment purchase in accordance with standards and specifications based on user needs.

n. allocate land mobile radio and other radio frequencies in conformance with FCC requirements on a coordinated, statewide basis.

o. provide budget planning and forecasting of telecommunications needs on a Statewide and individual agency basis.

<u>Policy and Planning Level</u>

In order to accomplish total management, the State must recognize its overall responsibility for the efficient and effective use of new and emerging technologies. Legislation creating the new

Department of Telecommunications under the control of the Secretary of Finance and Administration would be a step toward this recognition. Staff should also be provided who are capable of performing the functional responsibilities described below. A staff unit separate from that charged with day-to-day operational management would be a relatively small group which would be concerned with telecommunications technologies and applications; that is, five or ten professionals concerned with planning the application of appropriate technologies for any State program and service area and with the promotion of new applications.

Specific responsibilities of this division of The Department of Telecommunications would include:

a. overall long-range, comprehensive planning involving all state agencies and programs and all technologies.

b. policy setting and policy recommendations to the Governor and the Secretaries.

c. promotion of telecommunications applications in the Commonwealth agencies and institutions.

d. providing guidance to State agencies in their purchase and use of Telecommunications programming, spot announcements, etc.

e. research, innovation and demonstration of appropriate practical applications of telecommunications technologies.

f. receipt of grants from federal government foundations and others for experimentation, research, and demonstration and other uses of telecommunications technology appropriate to the Commonwealth's service missions.

g. administering a grant-in-aid program to the public broadcasting stations and, as the Commonwealth's interest in other local applications of telecommunications increases, to other local units or individual state agencies as appropriate.

Public Broadcasting Coordination

An essential element of telecommunications is broadcasting technologies, especially public radio and public television. VPTC's work in this area should be enhanced by the creation of an independent citizen's body to oversee the state's policy, planning, and operation. As stated previously this report recommends the creation of a Virginia Public Broadcasting Board to have authority over implementation of the State's policy for public radio and television support. The Virginia Public Broadcasting Board, appointed by the Governor, would have authority to:

a. recommend long and intermediate term comprehensive planning and establish priorities regarding the state's interest in public broadcasting.

b. recommend to the Governor and the legislature policy affecting the state's concerns about public broadcasting.

c. promote the effective use of broadcasting technologies and applications among the agencies and institutions of the Commonwealth.

d. develop research and demonstration projects that would test the utility of public broadcasting technologies in solving state problems.

e. receive grants and other gifts that would assist in forwarding public broadcasting in the Commonwealth.

f. authorize grants-in-aid programs to broadcasting entities in the Commonwealth and set guidelines and approve specific money grants that would move forward the state's policy and programs of public broadcasting.

In accomplishing these tasks, the Public Broadcasting Board should be supported (by legislation) by the staff of the new Department of Telecommunications and have full access to its staff's time and facilities.

Research Recommendations

Because of rapidly changing technologies, this study emphasized the nees for research and innovation functions within a central agency to design, conduct, evaluate, and demonstrate new programs from a cost benefit approach.

Planning Recommendations

The development of comprehensive mid- to long-term planning for all telecommunications technologies is needed in Virginia. The current Master Plan for Telecommunications has not been updated since its creation in 1974. During this period exponential changes in technology has occurred. The Commonwealth should support a comprehensive plan to identify potential applications of new technologies.

Management Recommendations

Telecommunications systems require effective, comprehensive and objective management. Control over all telecommunications systems should be established. In Virginia, system management, control and coordination would help ensure that:

a. economies of scale can be achieved in telecommunications systems and equipment purchases.

b. shared use is made of all appropriate state owned or leased facilities, equipment, or systems.

c. operational control of telecommunications facilities can be centralized (i.e., in the Department of Telecommunications.

d. maintenance of telecommunications equipment can be centrally managed even though operational control is performed by others (i.e., a state agency, vendor, etc.).

e. bulk buying can be maximized consistent with efficiency.

f. coordination among telecommunications users is achieved.

g. published procedures, standards, and guidelines are disseminated to guide agency and institution actions in managing the development and effective use of thier individual telecommunications facilities.

h. control over agency telecommunications acquisition is achieved.

i. in-use systems are subjected to continuing evaluation.

j. the rights of citizens and officials to information are maximized and the rights to privacy are adequately protected.

Proper management also means adequate information systems designed to accentuate and extend management control. These recommendations imply the need for current information systems covering all telecommunications systems and technologies.

Financial Management Recommendations

While the intent of this study is not a detailed fiscal analysis of telecommunications, certain financial policies are identified.

This study recommends that the working capital fund now very effectively used in financing the state's telephone system be studied for possible use as the mechanism for financial management of all telecommunications systems.

Consistent with the effective use of the working capital mechanism, this study recommends that user-sensitive billing procedures be utilized for all telecommunications services. This mechanism would ensure that all for services actually received or provided by the new Department of Telecommunications be billed to users in accordance with the benefits derived.

Most expenditures for telecommunications in Virginia are presently for operational purposes (i.e., for purchase of equipment, rental of facilities, and related activities). In addition, approximately $3 million per annum is being expended for grants to public tv stations. Historically, additional sums have also been expended for PTV capital grants programs. This report recommends continued financial support through grant-in-aid programs and adds funds for planning and research. While specific cost and evaluative data is not available, it appeared from this research that funding for public tv is insufficient to meet needs. Further, since no State funds are being provided for public radio stations and organizations, they should be provided.

This study recommends that funding for public broadasting (both public radio and public tv) continue to be made by the Commonwealth through the contract for services method in which funds are allocated for the purchase of instructional tv services. Additionally three types of State financing support are needed. These include:

a. Capital construction grants - The Commission believes that capital grants programs for support and expansion of public radio consistent with decisions and comprehensive planning on the part of VPBB should continue to be a part of this funding program.

b. Community service grants - in the 1979 session, the Legislature adopted a community service grant program for public stations to assist them in general public cultural tv programming. We recommend that these grants become a primary mechanism of support to public broadcasting. Further, that this aid should be expanded to include both radio and television.

c. Research and planning grants - The state's interests in public broadcasting can be best served as they make direct efforts to stay alert to useful changes by providing funds for research and planning in the public broadcasting field.

In recent years the state's major support of public TV (but not public radio) has been through annual contracts for instructional TV services. The present contract, of $3 million dollars, has a subsidy for public TV broadcasting. We recommend that these funds for the purchase of ITV services and programming be appropriated to the Virginia Public Broadcasting Board to be used as they are now (ie., for the purchase of public ITV programming and related services in aid of the individual school divisions of the Commonwealth. The exact levels of funding cannot be determined at this time, but should be a part of a comprehensive plan recommended elsewhere in this report.

Implementation Recommendation

In order to assist in the development of legislation and the implementation of recommendations, this study recommends that the Telecommunications Study Commission be continued in existence until December 31, 1980. The Commission's function would extend during the calendar year 1980 to interpretation of these findings and recommendations to the individuals and/or groups assigned to:

a. develop organization and management plans necessary for implementation of the recommendations in this report.

b. review and approve the comprehensive plan, and

c. provide assistance to state executives charged with responsibilities under items a and b.

INTRODUCTION

Expenditures for telecommunications in Virginia approach fifty-five million dollars annually. Funds are used to support state services: particularly education, law enforcement and safety, natural resources, health, and social services. Every state agency and institution spends some money for telecommunications.

This report, Telecommunications: A New Virginia Initiative , analyzes the organization, management, coordination systems and policy basis for telecommunications in Virginia. The study also suggest methods to improve and extend cost-beneficial applications.

This study reviews telecommunications operations, management and future preparation. Efforts are evaluated and proposals for more effective use of telecommunications technologies are stated. The report's recommendations are intended to provide legislative and executive guidance pursuant to the Commission's mandate. It does not provide the design of specific structural forms and implementing procedures.

Telecommunications is generally defined as the transmission of information signals (pictures, sound, data, etc.) from one place to another using electronic means. This definition also includes the hardware (equipment) systems used to transmit information. Technologies that were reviewed by the study team include those relating to telephone, teletypewriters, facsimile, data transmission, one and two-way radio, satellites, microwave, cable television, public radio broadcasting, and public and instructional television.

The definition of telecommunications contained in § 22-344.5 of Chapter 16.1 of *The Code of Virginia* is divided into two parts: first, telecommunications, in general, which is defined as the "orgination, transmission, emission or reception of signs, signals, writing, images and sounds or intelligence of any nature by wire, radio, television, optical or other electromagnetic system." Secondly, the services provided by telecommunciations which are referred to as "non-commercial, non-profit telecommunications to serve education, health, safety, welfare and human development including, without limitation, uses for pre-school, elementary, secondary, higher and continuing education and for public information and cultural purposes."

This definition should be expanded to focus on more than educational and educational-cultural applications. A new definition should include the development of new systems and a wide variety of government services. In addition, the definition should be expanded to provide for telecommunications' role in the improvement of state service delivery systems and include the effects of new technologies.

TECHNOLOGICAL DEVELOPMENTS

Developing operational definitions for telecommunications has become more complex because technologies have direct application in the solutions of society's problems. For example, evolutions in telecommunciations technologies have blended communications and computing technolgies and opened up new possible applications such as an integrated state data network. Because state computers increasingly interconnect via communications (e.g., switching and network control), agencies have access to more computing power and sources of information and thus are able to deal with social problems more effectively.

A key element of technological change is the microprocessor. The minute electronic chips used in terminals are replacing centralized computers. For example, intelligent terminals and network devices are now performing complex computational algorithms.

Traditionally, telecommunications networks were designed to carry voice signals in electronic forms analogous to sound waves. Voice and other analog signals had to be coded for digital transmission using pulse-code modulation or other similar techniques. Large scale integrated circuit technology is now allowing analog-to-digital conversion at less cost which will promote data communications. This type of technology has accelerated the trend toward digital communications facilities. Thus, the once clear division between "data communication" and "data processing" is now technically less important.

Another key technological change is the use of optical fibers. With the advent of optical technology, the choice of whether to use fibers or traditional cables for television will be made both on the basis of cost and on the fiber's potential for increased capacity. Installations are likely to be for conventional entertainment-oriented uses, but the potential of fiber optics allows in-house systems with two-way interactive communications, computing and image transmission, all of which have great potential applications.

Satellite communication is another example of new technology that can improve the delivery of existing services and increase opportunities for interaction over great distances. Satellites currently are being used for both radio and television commercial messages. In the near future it may be possible to transmit information to standard home television.

Tomorrow's communications network will be an integral part of a total electronic system which will include computing, television and operational transactions. These networks will be the "highways" over which electronic mail, fund transfers, worldwide television, and electric newspapers will travel. The development and implementation of such information systems raise a management challenge for designers, managers and the carriers. The so-called "office of the future" is illustrative of this challenge. In the next decade we will see radical change in the traditional offices. New office technology, for example, will allow a letter sent to a subordinate to be typed and edited on a video screen and then transmitted to all recipients instantaneously. In addition, the letter can be stored on magnetic mini-discs for future reference. Moreover, simple notes and messages can be dictated and sent in audio or text form to a recipient's "mailbox" for delivery or automatic storage.

In the future, terminal type devices will evolve from ordinary telephones and be equipped with video screens and touch-sensitive keyboards having multiple display options. Thus, within the home one will be able to select a variety of screen formats such as calculator and typewriter functions. Additional features may include access to airline schedules, theater programs, hotel rates in distant cities, skiing conditions in the major ski resorts or the menu at your local restaurant. Furthermore, electronic homes will be able to be connected to fire and burglar alarm systems, automatic remote utility meter reading, and remote utility load balancing mechanisms (to cut costs and conserve energy).

THE VIRGINIA SITUATION

The technological innovations described in the previous section hold great potential applications for Virginia. In state government there is little application of telecommunications technologies toward the solution of governmental problems.

The Virginia Public Telecommunications Council (VPTC) has been in existence since 1973 as a semi-independent agency of state government which report directly to the Governor via the Secretary of Administration and Finance. Historically, VPTC can trace its origin to a Joint House Resolution 17 in 1959. This resolution established a commission to study the feasibility of educational television. The commission was given responsibility to:

1. study the experiences of municipalities in other states already using educational television;

2. consider the overall benefits educational television might provide for the students and teachers of Virginia, and

3. recommend practical legislative steps for the purpose of developing a feasible program for using educational television in the Commonwealth.

The General Assembly in 1962 enacted the Educational Television Station Facilities Act (Chapter 428, 1962 Acts of Assembly). This law created a standing body, the Advisory Council on Educational Television and assigned it several tasks. It was given the responsibility to inventory existing educational television facilities, prepare a statewide master plan for educational development, and help administer state aid for the construction and operation of educational television facilities. Chapter 533, 1960 Acts of Assembly previously authorized local governing bodies to construct educational television stations.)

The Council adopted a plan for educational television in 1963. This plan provided an initial

open-circuit broadcast system. Petitions were filed with the FCC and ultimately, 19 ultra-high-frequency (UHF) channels for educational use were assigned to locations in Virginia. Seven channels have been activated by educational television stations pursuant to that action; 2 stations in Richmond and one each in Roanoke, Norfolk, Harrisonburg, Norton, and Northern Virginia.

The 1964 General Assembly made several important amendments to the Educational Television Station Facilities Act. The most important of these was to increase the ratio of state grant-in-aid to local stations for capital construction purposes from one-third to one-half. In a 1965 resolution the State Board of Education requested the budget for the 1966-68 biennium include funds to reimburse localities on a 50-50 matching basis for educational television operating costs. Another step toward the development of long-range educational television was the creation of VPTC which superceded the earlier body and had expanded authority to include non-profit telecommunications.

The function of VPTC is to study and coordinate the use of telecommunications services in Virginia. Its ultimate purpose is to develop a state master plan and a telecommunications network. The council also has responsibility to develop and apply telecommunications rules and standards for specific localities. VPTC, working through a professional staff, is charged with statewide planning for the efficient administration and development of telecommunications facilities and services and the administration and approval of all expenditures. In addition, VPTC is charged with assisting agencies and institutions in developing and operating telecommunications projects, formulating regulations and criteria for determining eligibility of public applicants for state aid, and other supportive administrative tasks.

An executive order in 1974 further expanded VPTC's authority to include control of the state administrative telephone system (SCATS) and the first central telephone system (CENTREX) located in Richmond. Additional CENTREX systems are now oeprational in Williamsburg, Roanoke, Norfolk, and Staunton. SCATS has also been expanded.

The 1977 General Assembly created the Department of General Services which was to have consolidated VPTC with other service agencies in the state. Governor Godwin, however, withheld the actual transfer and directed the council to further examine its statutory role and mission and offer organizational recommendations to the Governor and General Assembly by 1978. Part of the rationale for withholding the transfer was the feeling that "certain functions of the council should not be included in the Department of General Services general housekeeping duties but deserved to stand alone as a policy agency.

Pursuant to this argument, the General Assembly in 1978 re-established the VPTC as a separate state agency (Title 22, Chapter 16.1) with basically the same responsibilities. This legislation also established the Telecommunications Study Commision to evaluate the existing state mechanisms and make recommendations to the Governor and General Assembly as to the proper role and functions of telecommunications within the state. The Telecommunications Study Commission is to report to the General Assembly and the Governor before December 1, 1979.

ORGANIZATION AND FUNCTIONS OF THE VPTC

VPTC's policy development and implementation functions are divided into two elements:

1. The Virginia Public Telecommunications Council, and

2. A professional staff employed to assist the council.

Fundamentally, VPTC is a policy making and recommending organ to allocate state funds for instructional television and to generally coordinate state telecommunications. Administrative, operational and control responsibilities belong to the staff which has a director and associate directors for telecommunications and telemedia.

VPTC responsibilities include:

1. The Management and coordination of the Commonwealth's investment in and uses of all telephone and telemedia services and facilities.

2. The operation of a State Master Plan providing for the efficient administration and accessing of needed telephone services and facilities.

3. the coordination and development of telemedia, telephone, and other facilities and services as required for governmental operations.

Responsibilities specifically delegated to staff include:

1. Administration and approval of all telecommunication expenditures.

2. Providing assistance to state agencies and institutions in development and operation of telecommunications/telemedia projects.

3. The management of all data communications.

4. The formulation of rules and regulations for determining the eligibility of public applicants for telecommunications financial support.

5. The preparation and updating of long-range telecommunications plans.

VPTC Programs and Services

There has been a great deal of confusion as to which functions of VPTC staff should be directed to specific program areas. In order to avoid this confusion, the functions of the VPTC staff, for the purposes of this study, are divided into the following areas:

A. State government telecommunications services:

1. The 24-hour operation of the state's telephone CENTREX system.

2. Operational management of the SCATS and TELPAC networks.

3. The monthly billing of all state CENTREX and common carrier networks to state agencies using these facilities.

4. Development of planning, leasing and utilization policies for common carrier services including voice grade and data grade circuits.

5. Promoting the professional development and use of the 911 emergency system.

B. Telemedia Services:

1. The annual contracting for television (and related program services) requested by local public schools and the Department of Education with educational television stations.

2. The administration of the physical facility grant program.

3. General review and all CATV franchises pursuant to the policy and conditions contained in the current Master State Plan.

4. The promotion of public television broadcasting (PTV).

5. The promotion of public radio broadcasting in Virginia.

C. General Management and Administrative Responsibilities:

In addition to the functional responsibilities enumerated above, staff has general administrative and regulatory responsibilities which include:

1. The review and approval of all State contracts and agreements for telecommunications services or facilities.

2. The review and approval of requisitions for telemedia apparatus and systems prior to bidding.

3. Approval of master plans for higher education's telemedia development in the State's higher education institutions.

4. The monitoring and evaluation of the Commonwealth's telecommunications activities, investments, and planning processes.

THE STUDY PROCESS

The Telecommunications Study Commission (TSC) is required to undertake a general study of telecommunications services and effectiveness in Virginia. Specific responsibilities include:

1. Evaluating the effectiveness of public telecommuncations services.

2. Evaluating the existing state mechanism for allocating funds for public telecommunications services and facilities and for administering the Master Plan for Telecommunications with respect to public telecommunications facilities and services.

3. Developing recommendations as to the most cost effective use of public telecommunications in the Commonwealth.

4. Developing recommendations as to the proper location for the administration of state programs and provisions for the continued program evaluation.

5. Advising VPTC as to revisions or modifications to the Master Plan.

These five responsibilities constitute the research parameters of the Telecommunications Study Commission. This study, including more than VPTC's role, has concentrated on the actual and potential use and promotion of telecommunications. The Telecommunications Study Commission Research Plan identified 19 major telecommunications policy issues and a variety of performance measures to be applied. The results of this investigation are contained in the following chapters. Chapters 1, 2, 3, and 4 of this report summarize major findings and recommendations for certain state telecommunications uses. Chapters 5, 6, and 7 discuss specific organizational, financial and planning strategies for the optimum use of these technologies.

RECOMMENDATION

<u>One:</u>

We recommend that the definition of telecommunications include the use of telecommunications as an aid in solving some of the state's service delivery problems, as well as information movement.

CHAPTER TWO

THE STATE'S USE OF TELEPHONES

INTRODUCTION

Virginia is involved in telephone communications in two respects. First, as regulator of certain aspects of the telephone industry (through the State Corporation Commission) and, second, as a consumer of telephone services. The Commonwealth paid nearly 40 million dollars for telephone services in FY 1979 making state government the second heaviest user of telephone services. Because telephone expenditures constitute the greatest dollar investment for all telecommunications, a review of the state's administration of telephone services is imperative.

FINANCIAL CONCERNS

Costs

Telephone expenses (including local service, long distance, SCATS, teletype, data transmission, lines and cables) amount to about 8% of all state non-personnel expenditures. In 1978 almost $35 million was spent for telephone services. Moreover the rate of telephone expenditure increases exceeds other State service expenditures. This increase can be attributed to a greater and more productive use of telephone lines and to an accelerated inflation rate. Given these factors, the cost of the Commonwealth's telephone service should be about $53 million by 1982.

Working Capital Fund

About one third of the $35 million spent on telephone services in 1978 was administrated through a working capital fund by the Office of Governmental Telecommunication Services (OGTS), an administrative division of VPTC. The remaining two-thirds was billed directly to State agencies by private telephone service agencies and are paid directly by user agencies. The portion of the total State telephone expenditures for which OGTS is responsible has increased since 1976 because of growth in the number of consolidated or centrally controlled State telephone facilities for which OGTS is administratively responsible. It is projected that the State will pay a $54 million telephone bill in 1982, approximately 50% of this will be handled by OGTS.

Financial Management

OGTS has improved the financial mangement and processes of telephone administration since they took over the services in 1974. The billing system is now automated, and agencies' requests for service are analyzed to help insure the choice of the most cost-effective arrangement. However, problems do exist which argue for strengthening some aspects of OGTS's financial administration: for example, the collection of user agency bills is dependent upon manual information gathering methods and there are no internal directives concerning collection procedures; OGTS depends upon the telephone carrier for data upon which expensive decisions are based; and there are no written guidelines to be used in the evaluation of agencies' requests for new or expanded services. OGTS has initiated efforts to manage the finances of these increasingly costly services through implementation of the Communications Management Information System (CMIS), an arrangement to automate OGTS's information processing and storage methods.

PROFESSIONAL RESOURCE SERVICES

Consultation

Generally, State agencies do not have staff expertise capable of assessing their agency's telephone needs or of planning an appropriate telephone system. Most agencies rely on OGTS for this assistance. Unfortunately, many agencies do not use OGTS, for a variety of reasons, some of which include: agencies' reliance on a local telephone company or other outside consultants because of distance from Richmond, or because OGTS is unable to spare the manpower to provide such consultation. Some agencies don't utilize OGTS because they are disappointed with the depth or effectiveness of the information provided, while some agencies are simply unaware that consultant services are provided.

Other problems concerning consultation involve OGTS's policy of dealing only with the regulated telephone carrier. As a consequence of this policy, possible benefits of today's competitive market

are not obtainable through OGTS. Thus, agencies using OGTS's service many not receive the best available option. The review of all possible systems options should be the function of any consulting service.

An exhaustive review of all possible options necessitates the implementation of a telephone services procurement policy consistent with the principles of comparative purchasing. Such a policy would add an additional strain on OGTS's staff. Because of this manpower situation, comparative purchasing for telephone equipment has been delayed.

The object of a centralized consultation service available to arrange telephone systems is not only to the agencies' advantage, but to the state in general.

Centralized Approval Authority and Supplier Liaison

There are cost advantages in maintaining centralized control of telephone services. Where there was no centralized telephone management in 1978, the telephone costs per capita in the state was $424. Per capita cost under a managed system are $332. The Commonwealth obtains these savings not only because centralized control affords a tighter control on expenditures, but also because of economics of scale.

A policy of centralized control is only effective to the degree it is utilized; for example, many agencies are not required to obtain OGTS approval for their telephone equipment or service modifications and two-thirds of all telephone bills are not scrutinized by OGTS.

Operational Services Delivery

One of the most beneficial services provided by OGTS is the State Controlled Administrative Telephone Systems (SCATS). SCATS provides user agencies with reduced costs for intrastate long-distance calls (through the intrastate circuitry tariff known as Telpak), and reduced costs for nationwide calls via wide area telephone service or WATS lines.

SCATS arrangement shows substantial savings. Without SCATS, the average cost per minute would be 32 cents to the state, compared to 16 cents per minute with SCATS. Aggregate cost savings, however, have not been calculated.

The use of SCATS, is not without problems such as signal degradation and adaptation to user needs. Another problem is the "free service syndrome" of SCATS and WATS which may generate unnecessary calls. Although abuse is not considered serious, use guidelines are needed. Thus, while SCATS offers definite advantages, it should be monitored to determine effectiveness. It is hoped that CMIS will provide accurate total costs and a monitoring mechanism.

Consolidation

OGTS has provided user agencies with the consolidation of telephone equipment and services. Telephone services for agencies in Richmond, Newport News, Williamsburg, Roanoke, Lynchburg and Norfolk are consolidated into Centrex systems. Telephone services for agencies in the Staunton area are consolidated into a Dimension 2000 PBX system, offering Centrex-like features. The decision to consolidate in a particular area is made by OGTS, but the preparatory study is undertaken by the telephone carrier with OGTS's cooperation. After consolidation, new systems are coordinated by OGTS.

Consolidated systems offer many advantages to user agencies in particular and the Commonwealth in general. Agencies can realize savings through elimination of switchboard positions and replacement of duplicative outdated technology with modern PBX switching. In addition floor space is gained because of centralization. Although consolidation has shown costs benefits, OGTS does not provide definitive analysis of aggregate cost savings or pursue all alternatives. For example, new computer controlled PBX services are also available from non-common carriers. Comparative pricing might result in considerable cost savings. OGTS's present policies do not provide for competitive review of these options. A review and consideration of all possible benefits from consolidation by OGTS is imperative.

Telephone Directory

OGTS provides a telephone directory which has been the subject of user criticism. A forthcoming directory has developed processes which will, hopefully, alleviate user concerns.

911

The establishment of Local "911" emergency numbers is a statewide concern. Pursuant to this concern, the General Assembly has urged the establishment of a 911 System and charged VPTC with promoting its use. Many localities have not adopted 911. To further promote this system, comprehensive implementation guidelines should be developed by OGTS.

POTENTIAL SERVICES

Potential Services

There exists a wide variety of potential telephone services which may have application to Virginia; some examples include:

1. Because the TELPAK is charged at a flat rate, increased usage of this system could provide substantial benefits. For example, teleconferenced educational programs could facilitate statewide education. The Department of Taxation's telephone collections system is an effective use of existing TELPAK rates. Further utilization of TELPAK rates will become more important because of the energy crisis.

2. Technological barriers "disenfranchise" many groups such as the deaf, blind, and elderly. State agencies, however, are not equipped to meet the needs of these groups. Thus, OGTS should strive to provide services for these groups, particularly for access to governmental services.

3. A central agency should develop functional liaison and information-sharing capacities concerning technological developments with other governmental agencies and the private sector.

4. A central agency should initiate and coordinate efforts to maximize use, beyond 911, of telecommuncations for emergencies.

5. Because of heavy state telephone use, an agency reflecting user concerns should represent the state before the State Corporation Commission (SCC) and the Federal Communications Commission (FCC).

6. A cental agency should maintain a complete inventory of telephone equipment holdings which could be available to users.

7. OGTS should have a role in the planning and budget process, because they are privy to the information necessary to manage and plan future telephone services.

8. OGTS has no official manual of policies, directions and standards. The absence of a manual results in confusion and unenforceable policies.

SUMMARY

The demand for telephone services has created a workload heavier than OGTS can handle. The telephone carrier has become the de facto manager of the state's telephone system. The Commonwealth is fortunate that telephone carriers have, for the most part, considered the best interests of the state. However, the telephone carrier must always act in accord with his own interests. In a competitive market, the carrier's interests may not always coincide with the state's. It is imperative that the state pursue its own interests.

A purchasing policy consistent with comparative procurement should be implemented as a step to promote the state's interest. Comparative procurement will require state expertise. Thus, additional staff will have to be acquired. A central State telecommunciations agency should not only maximize use of non-carrier services, but simultaneously obtain efficiencies in present systems.

RECOMMENDATION

Two:

We recommend that a Commonwealth central organization be developed which would implement, and manage state telephone services. Such an organization should:

a. be staffed with expertise in management and telephone technology and have staff adequate to provide comprehensive telephone services

b. have an effective and efficient billing service based on usage

c. develop billing policies guidelines

d. develop an information gathering capacity independent of the telephone carrier

e. have enforcement authority to insure economies of scale

f. be responsible for long and short term operational planning

g. be a central contracting agency for all telecommuncations services

h. be responsible for the development and implementation of a telephone information system to assist agencies/institutions in management of the telephone system (e.g., inventory data, unit cost data, future projections of use, trends and related data)

i. assist user agencies in the control of SCATS abuse

j. effect consolidation of telephone equipment and services where feasible

k. develop comprehensive guidelines for use of 911 systems.

l. begin to comparatively bid major telephone system changes.

CHAPTER THREE

TELEMEDIA IN VIRGINIA

INTRODUCTION

Public Broadcasting as we use the term here - public radio and public television - can play a central role in providing cultural, instructional and informational services. While major achievements have been realized, particularly in the growth of instructional television, many of Virginia's public officials see great potential for this technology for government in fulfilling its various missions.

Public Broadcasting

It is difficult to trace the development of public broadcasting in America. The FCC in 1952 set aside a number of television channels and radio frequencies to serve the vaguely specified "educational needs of the community." More than a decade later, educational radio and television had made little impact on the public despite a federal funding program which started a station-building boom across the country in the early 1960's.

A Carnegie Corporation for Public Broadcasting Report identified several principles concerning public broadcasting. Foremost is the need for insulation from government. To implement this principle, public broadcasting has, in order to avoid federal budget cycles, tried to obtain multi-year appropriations. A second principle, which has been affirmed in legislation, stated that public broadcasting should be built on the "bedrock of localism." Another principle stated that financial aid for public broadcasting should come from diverse sources. Despite these principles, public broadcasting remains in the developmental stages and support is limited.

Public broadcasting, as envisioned in the Carnegie Commission report, provides alternative programming to commercial stations which should be complementary, not competitive.

The broadcast technologies in telecommunications hold promise for government systems. Whether Virginia takes advantage of these potentials depends on a willingness to aggressively pursue a program of planning, management and coordination, and provision of funds.

This chapter briefly describes areas for state interest in public broadcasting and makes recommendations as to a proper state role.

Currently Used Technologies

Presently, there are three major public broadcasting delivery mechanisms; these include:

1. over-the-air transmissions systems, including broadcasting, Instructional Television Fixed Services and satellites

2. wire or cable transmissions systems, such as cable tv and common carrier services, and

3. copy technologies such as video tape, video cassettes, video discs, facsimile, and print braille Combinations of these modes are also possible to form other discreet distribution systems.

One of the most attractive features of over-the-air broadcast technology for governmental program uses is its accessibility; state facilities are generally within the reach of a public broadcast station. Another advantage of this type of broadcasting is its relatively low cost for the delivery of state messages, especially when there are large numbers of receiving sites within a station coverage area. Moreover, with this system it is easy and economical (because hardware does not have to be changed) to increase the number of recieving sites within a coverage area.

Over-the-air systems are not without problems; for example, the system is inflexible because of restricted program capacity (one channel per station). Other reasons for a limited use of this system include a lack of reviewing equipment, appropriate programming, and scheduling difficulties.

Instructional Television Fixed Services (ITFS) is another type of over-the-air transmission system designed specifically for the delivery of instructional programs by schools, governmental organizations or other non-profit groups. Although ITFS offers up to four channels, it is limited to relatively small distances. The maximum signal range is usually 20-25 miles but use of repeaters can increase this range.

Because ITFS systems can be shared with governmental and non-profit organizations, inservice training programs for skills such as medicine, nursing, safety programs, and general continuing education are possible. ITFS systems can also be used for the transmission of information concerned with school administration. The Commonwealth, except for the special education teacher inservice program offered by CenTeX, Inc., does not use these systems, although the potential exists.

The use of Satellites as relay stations has become commonplace in recent years. A major advantage of satellite transmission is its ability to supplement land line facilities such as microwave and cable. Moreover, satellites can be used in remote locations where land lines are often not economical. Recent developments in satellite technology transmission has substantially reduced earth station costs. Further costs reduction may have applications both in the Commonweath generally and instructional television in particular.

Community antenna commercial television, known as Cable or CATV, was originally developed for remote locations where over-the-air signals were unsatisfactory. This use has expanded to both rural and urban areas and up to 100 channels can be received on standard televisions.

Traditionally, the FCC designated some cable facilities for public use. While some FCC rule changes have occurred, the principle of public use of cable remains intact.

A major feature is its potential for two-way communication. Application of this technology is limited in Virginia but potential exists particularly for off-campus education.

Another cable application similar to two-way techniques is leased common carrier service. In 1971, the FCC established a new category of common carrier for specialized communications. Services offered by these companies evolved out of the expanded use of computers and the need for high speed private lines for data. These specialized common carriers now also provide television services.

Copy Technologies

Video taping is similar to ordinary audio taping . Visual images are converted into electrical currents and magnetically coded on the tape. A major difference between audio and visual systems is that visual can store 200 times more information. Video discs are similar in appearance to audio records. Discs are rotated at very high speeds and the information is sent to antenna terminals of a standard television receiver (or direct video). These systems and techniques have application for Virginia and potential for solving service delivery problems.

RECOMMENDATIONS

Three:

This research leads to a recommendation that a comprehensive planning and policy program be developed to identify the possibilities of applying telemedia technologies to help solve the State government service delivery problems.

Four:

This research leads to a recommendation that the state support research into the possible use of different types of telecommunication-broadcast technologies. Research should include pilot demonstration projects and demonstrations of innovative applications.

Five:

This research leads to a recommendation that cable systems offer definite advantages to the state. Since cable systems are directly controlled by the FCC and are usually franchised to local governments, saving the State regulation costs, it is in the state's interest to insure that this system is used properly. To insure effective delivery, it is recommended that:

a. the Commonwealth establish a staff capacity to advise local governments concerning cable issues such as financing, community services, contracts, and cost effective use.

b. the State provide technical assistance to local governments considering franchise contracts for cable systems.

Six:

This research leads to a recommendation that ITFS application has potential in the Commonwealth and that a telecommunications planning group be established to develop and promote its use.

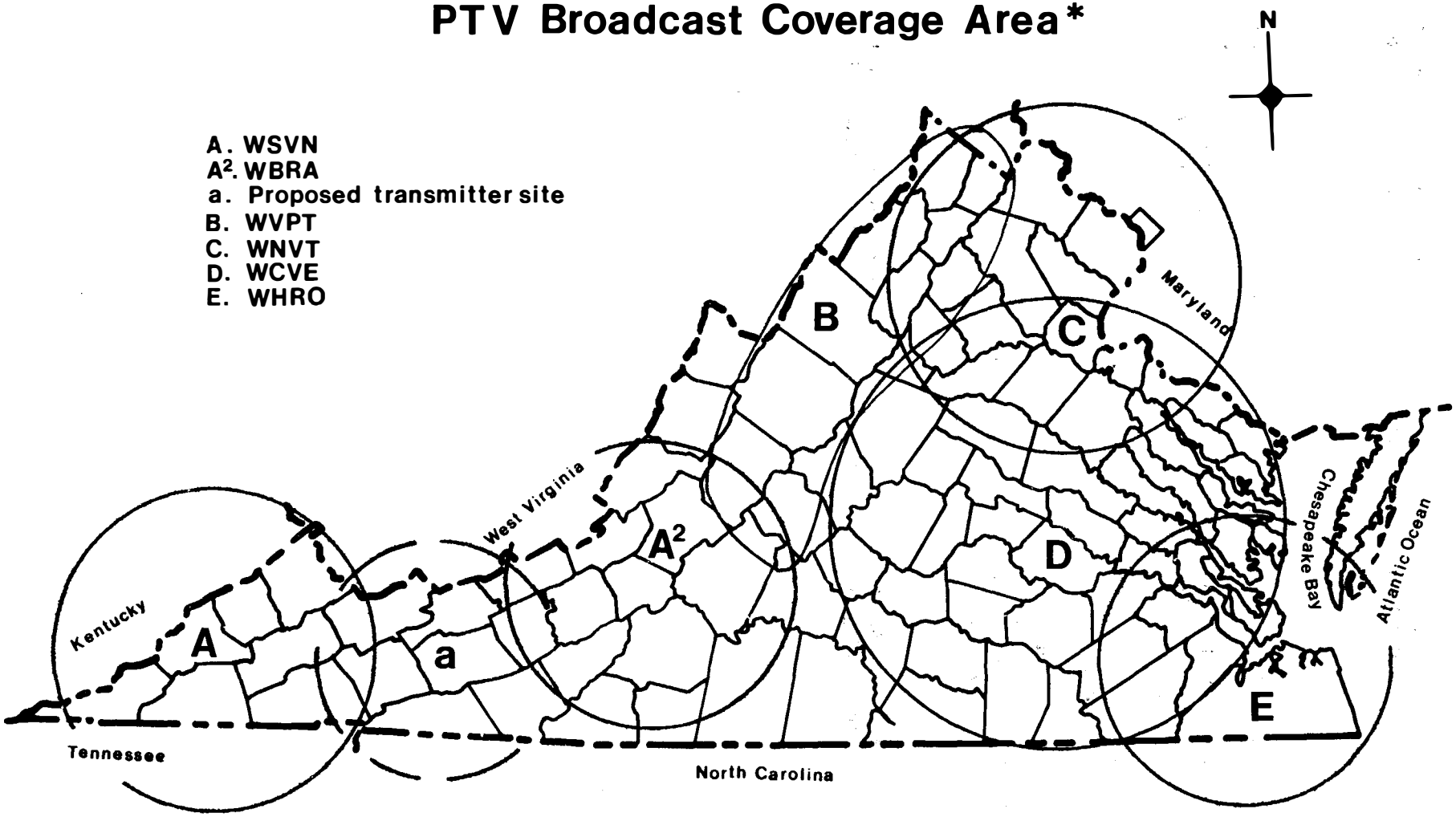
PUBLIC TELEVISION

The foundation of public television in Virginia and nationwide is the local broadcasting station. Local stations are supported by local stats and federal sources. Virginia's four public television licensees are all community licensed stations; the state does not manage, own, control or operate public television units. There are seven public television stations operated by the four educational television entities; these include:

Operator	Station
Blue Ridge ETV Association, Inc.	WBRA-15
	WSVN-47
Hampton Roads Educational Telecommunications Association, Inc.	WHRO-15
Shenandoah Valley ETV Corporation	WVPT-51
Central Virginia ETV Corporation	WCVE-23
	WNVT-53
	WCVW-57

Each of the above is licensed by the FCC as a community station and has a Board of Directors comprised of local citizens. The general geographic coverage of these station transmitters are shown in Map I following.

PTV Broadcast Coverage Area*



*Not including extended broadcast provided by translators

SERVICES PROVIDED

It is estimated that 80% of Virginia is served by Public Television. A new station in Marion will soon increase this percentage. Station programming is developed to serve local cultural, educational, informational, and instructional needs.

Some local programs are offered on regional topics of interest and are regularly scheduled or shown on an ad hoc basis. Occasionally PTV will broadcast commercial programs originally planned for distribution nationwide via commercial stations. For example, WCVE has broadcast National Hockey League games.

The Public Broadcasting Service (PBS) is the "fourth network" that provides a great deal of the prime time programming offered over PTV stations. For example, "Masterpiece Theater", "Live from Lincoln Center" and the "McNeil/Lehrer Report" were purchased from and broadcast via PBS satellite.

Financial Support

Local PTV stations in Virginia obtain money from all three sources of government - state, local and federal. Sources oflocal funds include municipal grants, membership contributions, and local fund raisers. Federal funds are primarily from grants from the Corporation for Public Broadcasting. Virginia State government provides the largest percentage of funds. The percentage of annual income attributable to each of the three major sources is shown below.

Source	% of All Income*
Local	29.3
State	43.7
Federal	26.8

*1978-79 figures, not 100% due to rounding.

Virginia's level of funding (43.7%) is slightly higher than the national average for State and local governments (i.e. 39.8%). Federal funding, however, in Virginia PTV is below the national average (i.e. 28.9%). Virginia ranks 24th nationally in per capita support of public television at $.58 per capita.

Virginia's funding approach is unique in that most PTV support consists of annual contracts. For instructional programming and services, portions of the annual contract are intended to assist stations generally and to purchase services.

The State initially provided over $6 million in the form of capital funds or grants to promote PTV. The Norton transmitter, the Blue Ridge ETV Association, and the WCVE Southern Translator system are examples of facilities made possible because of these State grants. State funds for instructional services are provided through the ITV contract. The Legislature in 1979 approved public tv funds for general adult, cultural and educational programming.

These funds, along with ITV contract funds, are distributed by VPTC. It should be noted that ITV contract funds are not seen as general funding by the stations, but is a fee for service. It is safe to conclude however, that with the possible exception of the ITV contract, State support for PTV has been nominal.

Management

PTV stations are independent of the State. State involvement is primarily restricted to monitoring the delivery of contracted services and in negotiating the actual contract between the State and the Station. Some minor promotion of the use of PTV facilities is made.

Despite limited involvement, the State has consistently supported public television. This support was demonstrated in 1979 with the passage of the 1979 PTV Community Service Grants Program. The State, however, could be more effective in promoting and supporting PTV. This can occur by more aggressive direct funding of existing stations without direct or indirect involvement by the government in station management activities.

State government has a role in public television. The public television stations present programming that would not otherwise be available to the citizens of Virginia. Yet, this medium is largely underutilized. The stations are medium to small sized and, with the large ITV contracts as the major sources of revenue, have minimal discretionary funds for services other than in school instructional television. The State could assist the stations to broaden their funding base by helping to promote the use of public television by State government in fulfillment of its missions as well as by cultural groups such as the Commission of the Arts and Humanities, museums and legitimate theater.

The importance of broadening the funding base for public television must be considered within the context of the development of alternative delivery systems such as CATV, ITFS, video cassettes and video discs. These newer technologies may decrease our reliance on over-the-air broadcasts for instructional television.

These technologies have implications beyond television in instruction. Their full implications are not known. The State, through some agency with PTV concerns, should be studying these technologies and guiding the stations toward continually improving service in the future. It is not clear that the VPTC is doing that now.

RECOMMENDATION

Seven:

The Commission recommends that a policy be clearly established and enunciated in such a manner that the General Assembly of Virginia declares that it is in the public interest of the Commonwealth to:

a. encourage and develop the growth of existing non-commercial educational public television broadcasting entities which have been developed with state assistance, and which provide a signal in all areas of Virginia where such a signal can reasonably be made available and in addition that public radio broadcasting be included where reasonably feasible;

b. support expansion and development of public television and radio broadcasting and programming where reasonable and in the best interest of the state.

c. encourage such programming which will be responsive to the interests and needs of the people throughout the Commonwealth, both locally and statewide, and which will constitute an expression of local initiative and excellence;

d. complement, assist and support a policy that will most effectively make public television and, where feasible, radio service, available to all of the people of the Commonwealth; and

e. to create a strong independent citizens board to facilitate the development and support of public broadcasting in order to afford maximum protection from extraneous interference and control, and to facilitate and encourage research and experimentation, including cost efficient application of new and emerging broadcast technologies, to serve the educational, cultural and informational needs of the people and the educational institutions of Virginia.

In making this recommendation, the Study Commission believes that public broadcasting should include any and all transmissions distributed for general public use over the air on behalf of or for the benefit of the public where the public or large segments of the public are generally able to receive such a signal, including transmission to educational institutions. This would include, but not be limited to, transmission by the four public television entities originally supported by the state's public radio and similar transmission.

In carrying out this policy, the Commission recommends that VPTC be reconstituted as the Virginia Public Broadcasting Board (VPBB) as an independent citizen's body with powers to encourage and support the growth and development of public broadcasting. This Board (VPBB) should consist of members appointed by the Governor. One such member should be appointed from each of the ten Congressional Districts and one member should be appointed at-large. The Board should elect its own chairman. No member should serve concurrently on the governing body of any

public broadcasting or telecommunications entity or be an employee thereof. Due consideration should be given also in forming the Board to insure participation by all segments of the population.

The members of the Board should receive no salary but should be reimbursed for expenses incurred in the performance of their duties. The Board should annually make a full report to the Governor and the General Assembly, as soon as reasonably practical after the close of each fiscal year, and make such other reports at such intervals as it deems necessary and advisable.

It is intended that the staff of the Department of Telecommunications will provide the administrative services for the VPBB but that the VPBB will have the ultimate responsibility for the purposes and responsibilities assigned to it.

The public broadcasting purposes and objectives of the Virginia Public Broadcasting Board should include, but not be limited to, the following:

1. To assist, develop, recommend and support a statewide policy to encourage the growth and development of a dynamic, free and effective public broadcasting service.

2. To provide overall long-range comprehensive planning.

3. To establish policy and make policy recommendations to the Governor and the General Assembly, including reviewing and updating of the comprehensive plan.

4. To coordinate, receive and act on public broadcasting applications from the agencies and institutions of the Commonwealth. To assist eligible applicants in planning, developing and operating a project and to grant and administer state aid therefor as permitted.

5. To provide research, innovation, demonstration and evaluation of appropriate practical applications relating to public broadcasting.

6. To receive and maintain information on public broadcasting facilities and services available in the Commonwealth. To acquire such reports, make such inspections, audits and investigations and prescribe such reasonable regulations as it deems necessary; to procure the temporary services of experts or consultants or organizations thereof, when such services are to be performed on a part-time or fee-for-the-service basis, to enter into agreements for the utilization of the facilities and services of other state departments, agencies and institutions, public or private;

7. To determine whether a telecommunications interconnect system is desirable and feasible.

8. To coordinate and encourage the efficient use of public broadcasting facilities in Virginia by state agencies and institutions.

9. To assist other Commonwealth agencies and departments in obtaining and administering State funds to be used in telecommunications.

10. To see that standards are established for the proper use of noncommercial television and radio by educational and other institutions and to assure the quality of programs produced with State funds.

11. To advise State and local groups with respect to changes in technology, regulatory matters and new uses for telecommunications designed to achieve efficiency and cost reduction.

12. To serve as liaison between the State institutions of higher learning, the State Department of Education, The Virginia Museum of Fine Arts and other State agencies and organizations and the five educational television stations with respect to the production and broadcasting of programs of public interest and the administration of State funds related thereto.

13. To serve as a State applicant agency for Federal and foundation funds and the Federal-State Grant-in-aid programs related to public broadcasting and to receive grants from the Federal Government, foundations and others for experimentation, research and demonstration and other uses appropriate to the Commonwealth's mission.

14. To apply for and accept on behalf of the state and to deposit with the State Treasurer any grant, gift, or contribution made to assist in meeting the cost of carrying out the purposes of public broadcasting, and to expend the same for such purpose;

15. To receive and disburse funds appropriated from the General Assembly for direct public broadcasting purposes. The Board should be the official agency of the state to receive and disburse any funds made available by the State through the General Assemblty for these purposes.

15. To solicit the cooperation of all departments, commissions, boards, agencies, officers and institutions of the state or any political subdivision with the Board in carrying out their purposes.

16. To do all things necessary and proper to effectuate the responsibilities herein set forth and all matters relating to public broadcasting which are not inconsistent with the law, and to coordinate the development and use of public broadcasting facilities and to promulgate rules and regulations for carrying out the purposes of this chapter, including reasonable standards and criteria for determining the eligibility of applicants for state aid as provided in this chapter, the extent to which existing facilities may be considered in determining the applicant's cost of a project, and to govern the method of transmission of public broadcasting services.

In accomplishing the purposes and programs of the Virginia Public Broadcasting Board it should be supported (through legislation) by the staff of the (new) Department of Telecommunications and have full access to their time and facilities to accomplish these and related objectives.

A citizen board is recommended to insure that public broadcasting is insulated from direct government decision making systems to insure that First Amendment rights are fully protected.

Eight:

Insofar as the funding for the grant-in-aid program is concerned, it is recommended that substantial additional financial support should be given to the entities carrying out the policy and objectives suggested in this report. These grants should include the following categories:

a. continuance of current capital grant-in-aid programs.

Capital grants should be provided on a matching basis for the entities providing public broadcasting services on a need basis. The Commonwealth, in the early sixties and continuing through the present, has supported the capital construction program of the stations through 50% matching grant programs. It is recommended that this should be continued on an as needed as appropriate basis.

b. major enhancement of the new community service grant program. This should be accomplished by funding amounts and making this mechanism a principle vehicle of State financial support to the stations for general cultural programming.

In the 1979 Session, the Legislature adopted a community service grant program for public television stations to assist them in the general public cultural television programming. It is felt that this is an important need and it is vital that these grants be substantially increased in order to develop the potential of this program.

c. authorization of a research and planning grant program. Funds should be granted to the Public Broadcasting Board in order to conduct research into methods and uses for improving public broadcasting services. The research projects would be carried out by the Department of Telcommunications or under contract by the Public Broadcasting Board and would be utilized to develop the most efficient and effective method of providing public broadcasting services to the people of the Commonwealth. Planning grants should be made available by the Board in order that it might develop its plan for public broadcasting in the Commonwealth.

The study Commission believes that with the adoption of this program, the citizens of the Commonwealth of Virginia will be adequately served with a comprehensive and efficient system of public broadcasting in the years ahead.

EDUCATIONAL CONCERNS WITH PUBLIC BROADCASTING

Origins and Growth of Educational Telecommunications

Educational telecommunications has a long history in America. The first non-commercial radio signals were transmitted in 1919 on an experimental basis from Madison, Wisconsin station (WXM since relicensed to the University of Wisconsin as WHA in 1921. From 1920 to 1930, educational institutions used at least 176 radio stations of which only 35 survived the 1929 economic crash. The survivors were mostly at land grant colleges where commitments to off campus learning and education was mandated under the Morall Act of 1862. These stations continued to serve through the period of World War II when the emergence of FM radio caused some educators and broadcasters to petition successfully for educational reservations on the FM spectrum.

In the 1950's the FCC announced its intention to develop a new plan for the television spectrum allocation. While some educators hoped this would reserve channels for educational use, the Commission clearly gave no evidence of such intent. It was not until 1959 that the first non-commercial educational television station (KUHT, licensed to the University of Houston) was on the air.

Another milestone for non-commercial educational broadcasting ocurred (as noted) in 1962 when President Kennedy signed the first Federal legislation providing support for educational broadcast facilities. Today there are 253 public television stations licensed to 159 licensees located in all 50 states except Delaware, Montana and Wyoming. Virginia houses seven of these public stations, administered by four licensees. Additionally, eighteen public radio stations are licensed in the Commonwealth; most to institutions of higher education. Little instructional radio programming is offered by these stations. All public television stations, on the other hand, offer extensive instructional programming. Only the television stations are provided state funding support.

In Virginia the VPTC and the Department of Education (DOE) at the State level, along with the Regional School Contract Planning Committees and the public television station at the local level, are active participants in the presentation of in-school ITV programming and related activities. These State and locally-based organizations share responsibilities that are mostly complementary, but sometimes duplicative and confusing.

The process of bringing a particular program to the teacher via the TV monitor begins in the local Regional Schools Contract Planning Committee (RSCPC). There are five RSCPC's in the Commonwealth, each working with a local public television station to represent the school superintendents in that station's service area. Each Regional Schools Contract Planning Committee (RSCPC) is composed of one representative from each of the participating school divisions (in the PTV station service area) appointed by the superintendent, a representative named by the Division of Telecommunications of the Department of Education, and one staff representative appointed by the chief operations officer of the public television station. A representative of one of the school divisions is elected chairman of the RSCPC committee. According to the Master State Plan, the representative from the PTV station acts as secretary for the committee.

The Committee's purpose is to identify the various ITV services, capacities, and programs that are needed by the schools in the PTV's service area for the ensuing fiscal year. The proposals are submitted to the various school superintendents for approval and then to the Department of Education for review. The Department of Education then refers the proposals on to the VPTC which has responsibility to negotiate with each of the stations for those programming services that have been requested. In this process both the RSCPC's and the DOE are available for consultation.

The RSCPC can be dissolved after the contract has been signed. Normally, however, the RSCPC or a RSCPC subcommittee can remain to advise on projects undertaken as a part of the contract.

The Master State Plan is, at best, ambiguous regarding the position of the RSCPC. It is unclear to whom the RSCPC is responsible. The RSCPC is formed by the PTV station and, in fact, uses the PTV facilities for meeting. An Attorney General's legal opinion is to the effect that the RSCPC is a station committee. Nevertheless, all but two of the RSCPC members are representatives of individual school divisions and the purpose of the committee is to propose services beneficial to the divisions. The Master State Plan permits the school divisions to determine that the RSCPC will remain in existence. The DOE also has a role in RSCPC activities. There is logic, given the role played by the

RSCPC, to view it also as a committee of the Department of Education.

The adequacy of the current contract negotiating process is not universally accepted. While there are those who feel that the VPTC does a good job of monitoring, others see weaknesses. One concern expressed was that the overhead growth and depreciation allowed in the contract could not be justified when compared with the services actually listed and delivered under the contract. If the funds paid to the stations through the contract are reserved exclusively for ITV services, it may be that more than a "fair share" of overhead and depreciation are being paid.

Higher Education Uses

While television is used in instruction at colleges and universities, there are no organizations comparable to the RSCPC or the Department of Education in the roles they play to coordinate ITV use. Although the VPTC attempts to undertake a coordinating function, its role is minimized by lack of funding and staff.

Further, it is the policy of the VPTC to encourage the State's colleges and universities to develop a Master Plan for Telecommunications, yet not all colleges have done so and there are indications that those who have had their Master Plans approved by the VPTC have not been faithful to their plans as they develop their telemedia capabilities.

It is evident that in higher education, the degree to which progress in telemedia use has been made seems to depend more on the strength and intent of the individual responsible for the telemedia service than on the presence or absence of a master plan or of a state agency like the VPTC to promote and coordinate its use.

Nevertheless, there are several examples of wise use of telemedia in higher education. One of the best examples is the Extended Learning Institute of Northern Virginia Community College. Through the use of broadcast television and other media, students are able to complete courses with only one visit to the campus.

Virginia Polytechnic Institute and State University (VPI&SU) operates an eleven channel system for video distribution to 200 locations across the campus. The system includes talk-back capability and can be used for long distance telephone conferencing or lecturing.

The Medical College of Virginia and Commonwealth University has developed an exemplary television communications system for education, information and communication. These modes all serve to demonstrate the potential of telemedia.

In summary, institutions with strong instructional television programs and aggressive directors will continue to promote telemedia. Where television service has been minimal or absent, there is less likelihood of growth. Without statewide direction or funding to support demonstration projects in television, the differences among the haves and have nots will broaden, and cost-effective planning and consolidation of programming will be less likely to occur.

RECOMMENDATIONS

Nine:

ITV use is essentially an educational operation, and as such, ITV use questions should be addressed by educators. We recommend that the Regional Schools Contract Planning Committees be retained as the principle mechanism to determine local school ITV needs, and that the Department of Education be responsible to coordinate local RSCPC actions and compile a composite state list of ITV services, programs and sources of assistance which stations can supply and negotiate with the PTV stations on behalf of the local RSCPC's.

Ten:

The Department of Telecommunications, the new state agency concerned with promotion of television and other telecommunications technologies, should be removed from direct negotiation of the ITV contract with the stations. We recommend that this agency be charged with responsibility to

explore alternative technologies and to assist educational interests in making the most appropriate use of broadcast and other means of distributing the ITV message selected by the educators.

Eleven:

This study leads to the recommendation that funding for public television be made a direct state effort and that funds be allocated primarily through the purchase of instructional programming, transmission services and technical assistance. It should be recognized that the present appropriation for instructional programming has also included funds to cover overhead and depreciation for the stations which should be taken into consideration.

Twelve:

We recommend that a study of the Commonwealth's need for a specific ITV program or series production insure that:

a. program and related services cannot be obtained from existing sources.

b. that whenever possible, production facilities funded by the Commonwealth are used to produce needed materials.

Thirteen:

We recommend that a study be made to the cost benefit potential of networking to interconnect the five public television stations in Virginia. This study should determine the use-potential, the costs of construction and the value to the citizens of the Commonwealth and to legislative and executive leaders of the capacity to broadcast simultaneously to all parts of the Commonwealth.

Fourteen:

We recommend that the new central state planning group and appropriate statewide higher education coordinating units (e.g., CHEV and VCCS) develop plans for and programs to use radio and television as a means of providing both credit courses and courses for adult general education purposes and to study the need to acquire a physical plant needed to implement this recommendation.

Fifteen:

We recommend in the higher education area that studies be made to compare learning potential of television and other telemedia-based learning methods.

PUBLIC RADIO

At present there are 18 noncommercial public radio stations in operation in Virginia. Thirteen stations are licensed to colleges and universities; 3 to elementary-secondary school districts, and one each to a private foundation and a church college. They range in power from 10 watts to 100 kilowatts; all but one broadcast in the FM band. Their missions vary and include simple broadcast laboratories for training students in broadcast careers, direct instruction in support of classroom activities, and broadcast of alternative public and cultural affairs programming.

With the advent of educational television and the attention it has been given over the years, educational radio has not flourished. Because of the lack of support, this medium has not been able to demonstrate its potential. While public radio has come a long way in serving the needs of the community, it is still a small force in many parts of the country, including Virginia.

The Commonwealth should be concerned not only with television but with radio as well as the other telemedia delivery systems. One cannot truly say that television is, without reservation, a more effective medium than radio. The effectiveness of radio has been demonstrated in the presentation of music, on-the-spot coverage of public events and current news. Secondly, this medium is far less expensive to utilize than television. Radio programming is produced at a fraction of the cost of TV programming. The versatility of radio is reflected in the ever-increasing size of its audience, whether

it be commercial radio or non-commercial public radio. Public radio in Virginia can become a more significant delivery system. Its programs can be solved at a much lower cost than is the case for television.

A unique feature of FM radio is a characteristic that enables one to broadcast simultaneously to regular programming on sub-carrier channels of the main program channel. In subcarrier broadcasting, a special signal is generated and transmitted along with the regular FM station's programming. These subcarriers are inserted within the regular FM channel. The subcarrier service may be received within the whole coverage area of the broadcast station with a special receiver. The service is now utilized to provide several types of programs including radio reading for the blind, Muzak style background music, medical information and special educational programs. In summary, subcarrier service can distribute a variety of instructional and informational programming to many specialized groups.

As noted, the subcarrier channels are not tunable on the standard FM receiver; therefore, special receivers are required. However, these receivers are not costly ($30 - $50), nor do they require complex installation. Use of sub-carrier channels would allow a station to carry on with its regular programming while simultaneously broadcasting to target audiences, such as classrooms or adult learning centers. Research shows that very few stations in Virginia are equipped to broadcast on subcarrier channels, although the cost of adding this capability is nominal.

We believe that radio can be the vehicle to bring certain kinds of instructional materials to relatively large audiences at a very low cost per consumer. A pilot project to test the potential of radio as a delivery system of instructional materials is underway in the Williamsburg area by CENTEX. The results of this test should indicate the capacity of sideband educational applications and may indicate the extent of support that might be provided in the future. The work of the Virginia Voice for the Print Handicapped is also pertinent and represents a formal attempt to institutionalize this technology in serving a specific target audience.

There is no statewide public radio network in Virginia. Licensees range from the large full service stations such as WRFK-FM in Richmond to small stations on college campuses oriented toward student entertainment and services. There is no direct State support of public radio although the four stations in the state receive some federal aid through the National Public Radio organization.

RECOMMENDATIONS

Sixteen:

We recommend that the State support the development of public radio across the Commonwealth. The Commission feels that state contributions to the funding of public radio are proper and needed and that the manner of that support should be the subject of further study and analysis. The precise mechanisms for support require careful consideration of a variety of factors including the character of the local community to be served. For example, one policy consideration is whether stations in rural communities with fewer local resources should receive more state assistance than stations in larger communities.

Seventeen:

We recommend that continuing consideration of these and other related issues be a part of the State's telecommunications program and that final resolution of the specific mechanism for funding public radio should be made as a result of an independent study.

STATEWIDE MANAGEMENT IN PUBLIC BROADCASTING

Public television has been a policy concern in the Commonwealth since the early 1960's. Formal organization to coordinate and manage programs and activities within this role began in 1959 with Joint House Resolution 17. That resolution established a commission to study the feasibility of an educational television apparatus. This commission and subsequent bodies have recommended practical legislative steps to develop a "conservative" educational television program in the

Commonwealth based on state coordination of community-based stations.

VPTC's Oversight Role in Public Television

Current law gives the VPTC sufficient legal authority to function across the board in coordinating a state policy stance regarding public television. VPTC is charged (by § 22-3344.6 Virginia Code) to assist units of local government state agencies and institutions and the non-profit telecommunications entities in the State in the construction, operation and use of telecommunications facilities services and programs. They are delegated administrative powers sufficient to accomplish the above mission and to do other things necessary to insure a viable public television capacity within the Commonwealth. The Master State Plan for Telecommunications adopted in late 1973 and early 1974 augments VPTC's power and provides a basis of rule and regulation.

Current VPTC Telemedia Functions

Primary emphasis by the VPTC staff and Council members is placed on the annual negotiation process whereby a ITV contract is made with each of the four public television licensees for the seven active station's operations. Negotiation, contract monitoring and related follow-up of this process consumes the preponderance of telemedia staff.

Another of VPTC's telemedia activities is the review of telemedia equipment purchase requests from State agencies and institutions. Agency requests are reviewed for appropriateness. Inventories (albeit incomplete) of equipment are also kept as an aid to this function. Some institutions of higher education have prepared telemedia master plans that, once approved, qualify them to purchase planned for equipment without prior VPTC approval. Evidence exists to suggest that not all agencies and institutions process all their equipment purchases through VPTC, although many do.

VPTC also has a role in the review of media contracts entered into by State agencies and institutions. This represents a relatively new responsibility delegated to the VPTC by the Secretary of Administration and Finance. While the VPTC has no statutory approval authority over many of these contracts, the Secretary's office is relying on the recommendations of VPTC.

Other mandated activities have not been done on a consistent, high volume basis. Staffing limitations and lack of general support from central government coordinating units are two reasons which account for this narrow operational focus.

The appropriatness of the Master State Plan for Telecommunciations has been questioned by various state agencies and institutions. A number of individuals within those organizations dealing with telemedia capabilities appear to be unacquainted with the Master Plan or do not use it as a guide in their telemedia activities.

While current VPTC leaders and staff recognize the limited role they now play and have articulated a concern for a more comprehensive role, a comprehensive approach does not appear forthcoming. Nor can one be expected, given the current staff expertise levels and recent organizational/operational history. A new emphasis and renewed organizational focus is needed.

It should be noted that VPTC is not a self-sufficient entity. They are constrained by budget, personnel and policy systems not of their making and not within their ability to override. In this situation, however, they are not alone. All state agencies operate within these large scale organization parameters. No agency in state government is independent of central control agency policies. There is a need for the active development of resources with which to meet the needs of the Commonwealth. Without the development of resources, the VPTC will have only a maintenance function.

Telecommunications Uses In State Agencies

Some telecommunications technologies have application beyond broadcast instructional television and radio in meeting the services delivery needs of state agencies and institutions. Various governmental agencies in Virginia make some use of telemedia in carrying out their functions. The potential for use offered by current technology seems to far outweigh the actual level of use.

Of the state agencies that have used telemedia, the predominant use is of radio and television to

distribute public service announcements (PSA'S). Very little of the design and production of PSA's has been done by state agencies, institutions or the public television stations.

State agencies contracting for such media activities as radio and television PSA's, films, ITV productions, scripts and the like has been with the commerical sector. State government does not fully utilize available state agency resources because of an apparent lack of knowledge of in house equipment inventories and expertise. It should be noted that the VPTC has recently completed an inventory indentifying the media capabilities of all State agencies and that, as part of its media contracting review process, the VPTC is alerting State agencies to those activities that can be met by State government.

In general, however, the VPTC is suffering from a low level of visibility and not all agencies are aware of the services VPTC has to offer. As a result, State media resources are underutilized and State government runs the risk of having the vendor become the major media advisor and designer.

Telemedia technologies can be used to save the Commonwealth money. To do this effectively it will be necessary to inform the potential users what is available, where it is available, and how to make appropriate applications.

Research, Demonstration and Innovation

With the rapid increase in the kinds and uses of telecommunications technologies in recent years, the need for knowledge concerning appropriate application of these technologies to Commonwealth programs is urgent. The need for telecommunications research and application of this research has reached critical proportions. Unfortunately, there is no applied research being done by Virginia State government which conscientiously attempts to apply telecommunications technologies to the resolution of its service delivery problems, or even to its information movement needs.

Responsibility for research, innovation and demonstration is in the Virginia Public Telecommunication Council. Staff are not pursuing this part of the mandate actively. Staffing limitations are obvious causes. There is no technical engineering expertise on the staff or on the VPTC Council and within state government generally. The results of this oversight for the Commonwealth can be significant.

The practical benefits of research innovation and demonstration of telecommunications technologies have not been made available to the Commonwealth. There is a limited use being made of this capacity. Leaders have failed to keep up with changing technology both in the central State telecommunications coordinating agency (VPTC) but, more importantly, in the management cadre of program departments and central state administrative agencies.

There is, however, one significant research and innovation effort going on in telecommunications within the Commonwealth. The Center for Excellence, Inc., of Williamsburg, Virginia (CENTEX), is a private, non-profit corporation directed to the use of five of the six telecommunications technologies (ITFS, SCA, CATV, satellite, telephone-line teleconferencing, and broadcast) for education, medical and social services research and resource development.

CENTEX is, in effect, an operational research laboratory capable of testing the operational feasibility of specific telecommunications technologies of an educational nature. Their work to date has been largely in the area of teacher inservice training using ITFS, CATV and teleconferencing technologies and FM side band radio for delivery of a service to the print handicapped and deaf. CenTex is also active in the delivery of specific educational service among other areas. The service delivery role aside, the research techniques employed in this corporation can be a model for the kinds of things needed to be done in the Commonwealth.

The overall lack of research in the Commonwealth is a serious problem. Examination of the potential application of new telecommunications technologies is an eminent need. In Virginia there is no centralized agency equipped with the resources necessary for the coordination of an active research and innovation program. The VPTC is not functioning in this area. All encompassing research projects and programs using telecommunications technologies to provide a framework for future planning in telecommunications are also lacking. In addition, Virginia is missing out on federal funding to aid in its telecommunications development.

RECOMMENDATION

Eighteen:

We recommend that the Virginia Public Telecommunications Council be reconstituted and that:

a. its name be changed to the Virginia Public Broadcasting Board.

b. its functions be extended to the full range of public broadcast (both radio and television) concerns of the Commonwealth. (See Recommendation Seven.)

c. Staff now assigned be organizationally located in the new Department of Telecommunications.

d. All managment and operational control and oversight be assigned to the new Department of Telecommunications as well as all staff planning, policy, promotion and research functions.

e. The Virginia Public Broadcasting Board (VPBB) be given full authority to call upon the expertise of the planning and research group for staff assistance in carrying out their responsibilities as described in Recommendation Seven. Staff work which affects public broadcasting issues or concerns should be directly responsive to the actions of the VPBB and coordinated fully with them to insure that the State's interests and policies are fully reflected in plans, policies and research performed by staff.

CHAPTER FOUR

STATE USE OF DATA COMMUNICATIONS,

LANDMOBILE RADIO, TELETYPEWRITER AND FACSIMILE

INTRODUCTION

Major changes in computer communications are taking place both in Virginia and worldwide. The idea that data processing and data communications are separate functions is becoming less important in view of the evolution and merging of the two technologies. Intelligent data communication nteworks are emerging which will be complimented by more sophisticated front-end computers. Management decisions concerning either function must take the other into consideration.

In the future, data communications networks can be expected to play an increasingly important part in both the public and private sectors of the economy. Intelligent data communications can decrease processing time while increasing potential data bases and computer power availability.

Data communication systems of State agencies are extending and integrating use of computers for storage of information, conversion of electronic signals from one form to another, switching and network control. Computers increasingly interconnect through data communications networks to provide their users with access to more computing power and more sources of information.

STATE AGENCY DATA COMMUNICATIONS

The computer revolution can be expected to expand exponentially as a result of the covergence of computers and data communication. Evidence of this convergence can be found in Virginia. The initial move in this direction began with the consolidation of data processing for State agencies.

Consolidation depends upon data communications for success. Because consolidation allows distant users access to powerful computers, the need for data communications has increased. Although some agencies used data communications networks prior to consolidation their number has greatly increased as a result of consolidation. For example, in 1972 the Commonwealth Computer Center had fewer than 10 State agency customers, but in 1979 this Center alone served over 40 customers. Agencies, by gaining access to powerful computers through data communications offer more efficient and less costly service to the general public and/or other State agencies. Examples include DMV which can now issue drivers licenses in minutes instead of days, and the VEC which can now maintain statewide files on job applicants as well as unemployment insurance applicants.

Use of Data Communications

The efficiency of online Data Communications applications has resulted in the proliferation of agency operations. At least six networks are in place in Virginia today and three more are in planning stages. Each is independent of the other and operates without consideration of the economies available through planning, better design and more complete shared use of facilities.

State management of data communications and data processing are divided among three agencies, namely, the VPTC , the Department of Computer Services (DCS), and the Department of Management Analysis and Systems Development (DMASD). A brief description of the roles and responsibilities under each functional area is presented below:

1. Virginia Public Telecommunications Council

The VPTC/OGTS has responsibility for planning, management, and coordination of all telecommunications, equipment and services including data communications. OGTS also regulates billing procedures for telephone services which support data communications equipment.

2. Department of Computer Services (DCS)

DCS has responsibility first, to operate the State's data processing centers, and secondly, to perform computing and systems programming services for State agencies, the Governor, and the Secretary of Administration and Finance, and finally, to provide technical assistance concerning data processing to State agencies.

3. The Department of Management Analysis and Systems Development

DMASD is primarily responsible for all contract review for data processing. This review is

inclusive of all data processing contracts, equipment purchases, use of consultants, services contracts, and submission of recommendations to the Secretary of Finance and Administration.

Need for Improvements

As previously stated OGTS has complete authority for State planning, management and coordination of data communications. However OGTS does not have the staff assigned or the necessary expertise to carry out these mandates. The resulting planning, management and coordination void is partially filled through DCS, vendors and with user agency personnel who may or may not have expertise. Research into the results of these activities suggests a haphazard piecemeal approach that allows little systematic planning, management or coordination and probably results in unnecessary expenditures, increased costs, and inefficient service.

Because DCS has no legal authority, all relationships with user agencies for data communications are best characterized by informal discussions and suggestions rather than official policy. The de jure role of the OGTS vis a vis the de facto role of DCS and its relationship with DMASD has created a number of management problems. It appears that the solution to these problems would be to establish legal authority with DCS.

Another area of concern in the State's management of data communications concerns the procurement of an integrated data network. It is estimated that such a network will cost between $1.5 and $6 million. The Commonwealth, however, has never completed a business case analysis supporting the need for this type of network.

Conclusions

Several conclusions about data communications in State agencies can be made:

1. The existing data communications systems in Virginia are to a great extent individual and autonomous in nature. There is no general coordination on a statewide, all technologies level. Thus, no statewide perspective is obtained.

2. Maximum efficiencies and economies in the use of existing data communications equipment and services are not being realized.

3. There is very little statewide planning and management of data communications systems to aid in performing such functions as the establishment of equipment and service specifications, and the determination of user needs.

4. There is no statewide technical assistance available to perform such functions as improving existing applications, providing design assistance, investigating the possibilities of using consolidated centers vis a vis stand alone applications systems and the promotion and demonstration of new technologies.

5. There is virtually no long range planning for data communications.

6. A business case concerning the feasibility of an integrated data network for Virginia has not been completed.

7. The current management and operations structure in Virginia does not recognize the merging technologies of data communications and data processing.

RECOMMENDATION

Nineteen:

This research leads to a recommendation that responsibility for data communications be associated procedurally and operationally with the agency that has responsibility for data processing operations and voice grade networks.

HIGHER EDUCATION

Introduction

Higher education has traditionally been considered to be unique in its computational requirements as compared to state agencies. In higher education a large portion of the computational load is in the instructional and research areas. The work tends to be varied, the programs are short, infrequently run, and special purpose computers are utilized. State agencies work, on the other hand, consists mainly of administrative data communications which is characterized by the repetitive use of relatively fewer and larger programs, operating with large volumes of data through general purpose computers. For higher education an elaborate policy and decision-making apparatus is in place that supplements the coordination provided by VPTC and DMASD. Higher education institutions are, however, only partially coordinated in their data communications acquisitions by these state agencies. More direct control is provided by the higher education groups coordinating data communications.

Management

The management of data communications in higher education can be divided into three functional areas which include:

1. MIS Director of Education, Office of the Secretary of Education

Gives preliminary approval to all proposals for changes in computing facilities and personnel. Also responsible for developing plans for computing in higher education.

2. Director, DMASD

Approves proposals for changes in computing facilities or personnel.

3. Director, OGTS

Approves proposals for acquisition of communications equipment and services.

The role of OGTS in the management of data communications is unclear; there are some areas where OGTS's responsibilities have been delegated to other groups or agencies when those agencies have prepared acceptable master plans.

A more serious management concern relates to OGTS's responsibility to provide technical assistance in support for data communications to higher education. As is the case for state agencies OGTS does not have the manpower required to fulfill its mandated responsibility. Moreover, higher education does not have a counterpart to DCS to assume even partial responsibilities for these functions.

Conclusions

This research leads to the following conclusions:

1. OGTS has legal authority to approve the acquisition of all data communications equipment in the institutions of higher education. In practice however, the planning for the data communications systems has been done by personnel at the institutions.

2. Long range, statewide planning for the use of data communications, including considerations of changes in technology appears to be non-existent.

RECOMMENDATION

Twenty:

This research leads to a recommendation that an agency similar to the one recommended to manage and coordinate state agency data communications be established to also manage and

coordinate higher education data communications.

LAND MOBILE RADIOS

Reliable communications with agents in the field is vital to fulfilling the functions of many State agencies. This communication is best achieved through the use of a system of land mobile radios in which remote personnel can communicate with each other and/or to personnel in a central office via radio waves. Because a radio can only receive one message at a time on any one frequency, each user has to be restricted in the number of frequencies he may use in order to avoid interference with other users. Federal law requires any prospective user of a frequency to first obtain a license from the Federal Communications Commission (FCC).

Paging Systems

The simplest form of land mobile radio is paging. Paging systems typically are one-way communication systems allowing a message to be sent to a recipient but not allowing response via the receiving unit. Radio signals are transmitted from a central base seation to a mobile unit (the reverse direction is possible, but less prevalent). Most paging systems currently in use transmit a signal which activates a tone (beep) or sends a short verbal message. The tone method requires the recipients to call a prearranged telephone number for instructions. When paging systems are interfaced with telephone exchanges, the direct sending of voice messages is possible.

As is the case nationally, Virginia state government paging service users primarily have lease contracts with radio common carriers or wireline companies. A multitide of paging companies serve state agencies and institutions in various locations.

Whereas paging involves, for the most part, one-way communication, more sophisticated radio utilizes two-way communications. A typical two-way radio system includes these components which are designed and located in such manner that a definite geographic area is covered.

Use of Two-Way Radio in Virginia

The bulk of Virginia's use of two-way radio is by agencies which have eigher law enforcement or emergency functions. In recent years, the number of agencies using new two-way radio frequencies has increased. In addition, the number of units using previously approved frequencies has also increased.

The Division of State Police is the predominant user of land mobile radio in the Commonwealth. The State Police are presently overhauling what is generally considered to be an obsolete radio system. A new land mobile system will be in place by early 1981. With the new system the approximately 1400 State Police cars will have considerably expanded communications capability. Each car will be equipped with at least four different radios. The new statewide network will utilize seven dispatch stations interfaced with a system of remove repeaters. The infrastructure which provides statewide coverage consists of a system of high frequency radio control circuits or microwave. This microwave system has a capacity of up to 300 channels in some places, and has the capability of carrying telephone and teletype messages. The microwave equipment statewide can be monitored from a central location. In addition to operations, all maintenance and installation of the system are also conducted in-house.

State Police have developed expertise in the maintenance of radio equipment. Several agencies, rather than obtaining a vendor or developing in-house maintenance capabilities, rely on the State Police for radio maintenance. In total, State Police maintain approximately 70% of the land mobile radio units and support equipment operated by state agencies. The maintenance service obtained is considered by users to be of superior quality. Thus, a number of agencies, not presently served by the State Police, have requested assistance.

There are no exact figures available on the state's investment and current expenditures on land mobile radio equipment and services. It is estimated that Virginia has between $300,000 and $1,000,000 worth of paging equipment and $12 million dollars worth of two-way radio equipment in place.

OGTS has responsibility for planning, management and coordination of land mobile radios and paging systems. However, OGTS does not have staff assigned or the necessary expertise to carry out these mandated functions. The resulting planning, management and coordinations void is partially filled through the Department of Purchases and Supply (DPS), vendors (both for service and hardware), and with user agency personnel, who may or may not have expertise.

The planning which has occurred in land mobile radios has been a result of some state agencies' assistance to localities and other state agencies or vendor support. Examples of this assistance are two state communication master plans completed by the Division of Justice and Crime Prevention (DJCP) and the Division of Emergency and Energy Services. (EES)

The management and coordination of interagency communication has been significantly enhanced by the development of the Statewide Interdepartmental Radio System (SIRS). Mandated by the Secretary of Public Safety, the purpose of the system is to provide a direct radio link between local law enforcement personnel and State Police Officers.

DJCP recognizes that the legal authority of the SIRS Advisory Board is questionable because the FCC has final control over frequencies allocations. However, the SIRS board has reached a verbal "understanding" with the FCC over the use of the SIRS frequency in Virginia and the FCC has cooperated with the board in allotting frequency usage. In addition to the State Police, local sheriffs and police, the board's guidelines allow the Department of Corrections to have limited use of the system. Additional agencies requesting utilization of the SIRS frequency must apply to the board for FCC operating license pro forma.

Need for Improvements

Research into the results of land mobile radio planning, management and coordinating activities suggests a haphazard, piecemeal approach that allows little systematic planning, management or coordination and probably results in increased hardware, service and maintenance costs.

This research has identified several problem areas concerning land mobile radios where a central state planning, management and coordination agency could play a significant role:

1. Determinations of User Needs: A needs assessment or evaluation of land mobile services in Virginia has not been done. Therefore, it is not possible to determine if land mobile operations are cost-effective or even if some present or new operations are needed.

2. Frequency Coordination and Management: The heavy use of land mobile radio has increased the need for frequency coordination and management. Although OCTS established a Land Mobile Frequency Committee in 1974, it has met only once. Lack of frequency management results in channel overcrowding (particularly on Low Band), difficulty in locating appropriate channels, improper tone frequency adjustment on equipment, and the selection of inappropriate equipment.

3. Maintenance Systems: Hardware maintenance for land mobile radio is performed primarily by State Police. A considerable proportion of the equipment, however, is maintained by vendors. This is particularly true for pagers. DPS contracts may require purchases of paging equipment which can't be maintained locally and/or more remote agencies often have to sent equipment out of town for repairs. This results, in either case, in service time delays, increased costs and the loss of systems efficiency.

4. Hardware Procurement: There is not presently, or has there been in the past, a "contact person" at OGTS with expertise in land mobile radio to assist DPS and user agencies. Thus, DPS attempts to write bid contract specifications based on perceived user needs and assistance from the State Police. This process may produce one or more of the following results: increased equipment costs, inappropriate and/or noncompatible equipment.

5. Use of Microwave: The microwave network now used in support of Land mobile radio applications exclusively by the State Police needs to be evaluated to determine if it could be expanded to include other agencies. The system provided limited statewide coverage.

6. State System vs. Common Carrier/Wireline: Some state agencies operate and manage their own private paging systems (including base station and telephone interface equipment) abeit only a

few (e.g., VPI, Division of Building and Grounds and MCV/VCU Hospital). There is a need for the state to investigate the possibilities of state-owned and operated systems (which could also accomodate two-way radio) and the consolidation of existing systems.

Conclusions

This research leads to the following conclusions:

1. The existing land mobile systems in Virginia in general are individual and autonomous in nature. There is no general coordination on a statewide all technologies level. Thus, no statewide perspective is obtained.

2. Maximum efficiences and economies in the use of existing land mobile equipment and services are not being realized.

3. There is no active statewide planning and management of paging systems performing such functions as frequencies coordination, establishment of performance specifications, and the determination of user needs.

4. There is no statewide technical assistance available to perform such functions as improving existing applications, proving design assistance, investigating the possibilities of state owned and operated systems and the promotion and demonstration of new technologies.

5. There is no totally integrated maintenance for land mobile systems. Thus, maintenance service tends to be piecemeal and not cost effective.

RECOMMENDATION

Twenty-one:

This research leads to a recommendation that all land-mobile radio systems' planning, management, and coordination be a part of the responsibilities of the new state agency which has been recommended in this report to have total responsibility to manage and coordinate use of telecommunications technologies.

TELETYPEWRITERS

Teletypewriter (TTY) is a generic term used to refer to a series of different types of teleprinting equipment such as transmitters, tape punches, and page printers. TTY's are basically electric typewriters by which a sender types out a message which is converted and sent over telephone lines to a receiver where the signal is reconverted and typed. TTY's provide a quick method of sending a "hard copy" message.

Use of TTY's, although increasing numerically, have been curtailed by more efficient forms of communications such as telephone, intelligent terminals, fascimile and teletypewriters hooked to computers (e.g., electronic mail and mailgrams).

There are three primary applications for TTY's. These include:

(1) Information Access and Exchange

(2) Teletypewriters Exchange Service (TWX)

(3) Teletypewriters for Deaf People - referred to as TD applications.

In Virginia only a few state agencies and institutions use TTY's for general information access (e.g., Office of Energy and Emergency Services and universities) to sources such as the Weather Bureau and UPI but this application is extremely small. It should be noted that a great amount of TTY type equipment is used by state agencies, such as in the State Police National Law Enforcement teletypewriter System, but these TTY's are interfaced with computers. The

Commonwealth's use of ordinary teletypewriters is limited to TWX applications. The TWX network links 18 college and university libraries and is used primarily from inter-library loan and message communications.

Teletypewriters can be adopted to facilitate communications for the deaf (TD). The use and promotion of this equipment, obviously, is heaviest for those agencies concerned with providing rehabilitative services (e.g., Virginia Council for the Deaf and the Department of Vocational Rehabilitative Services). Some other service organizations, with whom the deaf have a particular need to communicate, have also purchased TD equipment (e.g., Secretary of Human Resources Office and the Office on Aging). TD equipment costs about the same as regular TTY equipment which ranges from $50.00 (surplus units) to $800 (all electric portables). Rehabilitative service agencies perform a multitude of functions regarding TD equipment including new acquisition (through Department of Purchases and Supply), entering into research and development arrangements with the telephone companies, and the acquisition installation and maintenance of surplus equipment which is difficult to obtain.

Facsimile

Facsimile (exact copy) is a generic term used to refer to any of several communication techniques for sending half tone hard copy pictures by wire or radio circuits. Facsimile systems perform the same functions as an ordinary office copier except that a considerable distance is involved and two pieces of hardware are needed. The transmitting facsimile scans the message to be sent and converts half tones into electric signals which are received at another location where half tones are converted back and recorded.

Most facsimile systems use common voice grade telephone lines for transmission. Telephone lines provide great flexibility, however, because of limited band width, the resolution obtained is inferior to other forms of transmission and as speed increases, resolution or quality decreases. Another important consideration for facsimile is machine compatibility. Hardware having compatibility, or adjustment capabilities, is particularly important in regards to transmission speed since different types of equipment transmit and receive at different rates.

The use of facsimile units, nationally, has increased rapidly in recent years from 22,000 units in 1970 to 135,000 units in 1978. Facsimile transmission has some definite advantages vis a vis other forms of telecommunications, for business, industry and government. Basically, the Commonwealth's use of facsimile can be divided into two classifications. First, users that utilize facsimile as an integral part of their communications network (e.g., Department of Welfare, Department of Corrections (which has the most extensive facsimile network), State Water Control Board, and the Tidewater Library Consortium). These users transmit heavy volumes of facsimile. The second group is comprised of occasional users who use facsimile for special needs (e.g., universities, Department of Education, and VPTC). Communication is greatest for state agencies and institutions having the need to send and/or receive official documents between and among state and federal offices.

OGTS has complete authority for state planning, management and coordination of fascimile and teletypewriter equipment and services. However, OGTS does not have the staff assigned or the necessary expertise to carry out these mandates. The resulting planning, management and coordination void is partially filled through the DPS, vendors and with user agency personnel, who may or may not have expertise. Individual agencies rely on vendor support and/or inter or intra agency personnel on an ad hoc basis. Research into the results of these activities suggest a haphazard piecemeal approach that allows little systematic planning, management or coordination and probably results in unnecessary expenditures, increased costs, and inefficient service.

This research leads to several conclusions concerning the state's planning, management, and coordination of TTY's and facsimile, which include:

1. The existing teletypewriting and facsimile systems in Virginia are individual and autonomous in nature. There is no general coordination on a statewide all technologies level;

2. There are rapidly increasing needs for new and additional services where new technology can play a significant role;

3. Maximum eficiencies and economies in the use of existing teletypewriting and facsimile

equipment and services are not being realized;

4. Effective long-range planning is virtually absent;

5. There is no active central statewide planning and management of TTY and facsimile systems performing such functions as determinations concerning costs, user needs, and effective telephone utilization;

6. There is no active statewide central research and development work performing such functions as improving existing application, investigating the feasibility of new systems, and the promotion and demonstration of new technologies.

RECOMMENDATION

Twenty-two:

This research leads to a recommendation that all teletypewriter and facsimile systems planning, management, and coordination responsibility be given to the central state agency having technical and operational telecommunications responsibilities.

CHAPTER FIVE

ORGANIZATION FOR CENTRAL TELECOMMUNICATIONS MANAGEMENT

INTRODUCTION

The State's managment of telecommunications is best described as a hybrid system - partially centralized, partially decentralized. The centralized functions are legally assigned to the VPTC (although other agencies unoffically assume statewide responsibilities) while the decentralized functions are exercised by various State agencies and institutions of higher education.

Demarcation of responsibilities is based more on practices that have developed over the years rather than on any established administrative policy. Complicating this administrative system is the lack of statewide uniformity in the administrative policies exercised by the VPTC and the lack of consistency in the administration of those activities that are decentralized. In short, clear patterns of control are obscure. For example, radio communication is largely in the purview of the State Police Department while other important communications functions, such as data communication, are largely in the Department of Computer Services.

An element of centralized management was introduced with the creation of the Office of Governmental Telecommunications Services within the VPTC although this also resulted in the dual management system that exists today. The most important functions of OGTS are reviews of agency requests for new services and equipment purchases, coordination with common carriers, and the integration of the State Centrex systems as well as the planning and direction of these central State functions.

TELECOMMUNICATIONS ORGANIZATION

Some specific conclusions about the operation of telecommunications programs in the Commonwealth and several fundamental organizational and functional ideas have been identified which should provide the basis of statewide telecommunications organization and management. Fundamentally, telecommunications decisions should be made at three different places in the organization of the Commonwealth: at the agency level, at a system management and coordination level and at overall, statewide planning and policy levels.

The Agency Level

The various State agencies and institutions of higher education in the Commonwealth have an interest in the various telecommunications technologies and in the systems purchased by the State to assist them in meeting their information movement needs as well as their service delivery problems. State agencies and institutions currently make many decisions at the operational level. None of the findings of this study have indicated a need to circumscribe in any way these important agency level decisions.

System Management And Corrdination Levels

We suggest significant changes at the system management level. Specifically, it appears that with the exception of the SCATS and Centrex system coordination done by VPTC, little general systemwide telecommunications design, coordination or standardization are undertaken by the Commonwealth. What system design is being undertaken is largely being done by individual agencies or by the various suppliers of telecommunications technology (the common carrier telephone companies, mobile radio, teletypewriter, paging and telefacsimile manufacturers and other commercial system suppliers).

It seems appropriate for the Commonwealth to provide system design and equipment specification functions in place of the suppliers who may be more responsive to their own interests. The experience of other states confirms the fact that design by state employees can result in significant efficiencies in the purchase of transmission systems for both voice and data technologies.

Voice and data communications technologies are converging. In the very near future, telecommuncations technology will make it equally efficient to transmit either voice or data over common carrier circuits. Given this convergence of voice and data technologies, the Commonwealth should merge the existing organizational concerns with voice grade telephone system coordination and data communications. This would require close coordination between the VPTC Office of Governmental Telecommuncations Services (OGTS) and the Department of Computer Services.

At this time, Virginia has no engineering specialists in data communication, telephone technology, electronic or radio engineering managing any of its telecommuncations system on a statewide basis. This lack is acute and should be remedied. At least three areas of telecommunications operations are needed to provide leadership to the telecommunications section of the new agency. Savings that can be incurred through more efficient design of the telephone and data communication systems will more than pay for the additional personnel costs of these specialists.

Functionally, a new statewide telecommunications operations unit would

1. manage and coordinate the "electronic highway," or the various telecommunications systems funded by the Commonwealth

2. provide expert guidance and control over the telecommunications systems. Direct operation and maintenance may be provided by others–the suppliers, the common carriers or State agencies themselves.

3. supervise vendor relationships

4. develop standards for the lease or purchse of equipment or other components of the telecommunications systems

5. approve equipment lease or purchase in accordance with preset standards and specifications

6. allocate land mobile radio and other frequencies in conformance with FCC requirements on a coordinated statewide planned basis

7. provide expertise for budget planning and forecasting of telecommunication needs on a statewide basis to assist individual agencies and institutions as they develop their own telecommunications expenditure plans.

Policy And Planning Level

A third aspect of telecommunications management on the State level should be a response to the need for efficient and effective utilization of new and emerging technologies. This study's findings support the conclusion that a small professional staff of perhaps five to ten policy planners and researchers would be a valuable component to the State's administration of telecommunications. Their mission would be to forecast the telecommunications needs of the Commonwealth and to plan and promote the cost-efficient utilization of the newer technologies by the agencies and institutions of State government.

The new planning and policy unit would be responsible for:

a. overall long range, comprehensive planning involving all state agencies and programs on an all technologies basis.

b. policy setting and policy recommendations Governor and to the Cabinet Secretaries.

c. the promotion of telecommunications applications

d. providing guidance to State agencies in their purchase and use of telecommunications programming.

e. research, innovation and demonstration of appropriate practical applications of telecommunications technologies.

f. receipt of grants from federal government foundations and others for experimentation, research and demonstration.

f. administration of grant-in-aid programs to the public broadcasting stations, other telecommunications entities as well as State agencies and institutions.

Public radio and public television are essential elements in the State's telecommunications

system. The important work done by the VPTC should be continued by the creation of an independent citizen's body to oversee the state's interests in public broadcasting policy, planning and operation. A citizen board is recommended to ensure that public broadcasting is insulated from direct government decision-making systems and to ensure that first amendment rights are fully protected.

This Virginia Public Broadcasting Board should have authority to:

a. recommend long and intermediate term comprehensive public broadcasting planning

b. recommend to the Governor and the legislature policy affecting the State's concerns about public broadcasting.

c. promote the effective use of broadcasting and related technologies by the agencies and institutions.

d. Develop research and demonstration projects that would test the utility of broadcasting and related technologies in solving State problems.

e. receive grants and other gifts that would assist in forwarding public broadcasting in the Commonwealth.

f. administer grants-in-aid programs to telecommuncations entities in the Commonwealth, set guidelines and approve specific money grants.

Legislation should establish a close working relationship between the Citizens Board and the Department of Telecommuncations. Any staff support required by the Board would be supplied by the prefessional and clerical staff of the Department of Telecommunications.

RECOMMENDATIONS

Twenty-three:

We recommend that legislation be drafted to create a Department of Telecommunications under the Secretary of Administration and Finance. This new department is to be composed of the existing Staff of the VPTC and several new engineering and planning specialist positions.

We further recommend that an executive branch task force be created to prepare a detailed organization plan including functional breakdowns, staffing in tables and specific operating mission and responsibility statements.

Twenty-four:

We recommend that legislation be drafted creating a new Division of Telecommunications Planning Services in the Department of Telecommunications with professionals capable of assuming responsibilities identified in this chapter.

We further recommend that the task force identified in Recommendation Twenty-three be required to design and implement this organizational unit.

Twenty-six:

We recommend that state agency users of telecommunications technology retain responsibility to determine agency needs for this technology in both their information transmission and service delivery needs. Assistance provided by the Department of Telecommunication would facilitate these essentially individual agency decisions. The task force noted above should have responsibility to review and modify agency telecommunications responsibilities.

Twenty-five:

We recommend that all telecommunications engineering, equipment specification, network design

and other engineering or technological control be lodged in the New Department of Telecommunications. State agencies having these staff expertises should be relieved of "system" designs or operator responsibilities and these functions delegated to this new Department. Nothing in this transfer should be interpreted as foreclosing the possibility that an agency would not retain (or acquire) functional responsibilities for operation of a telecommunications subsystem (or a single agency system) of the telecommunications transmission network or networks. Rather, the intent here is that the Department of Telecommunications acquire fundamental responsibility for an efficient and effective interconnection (network) system (s), parts of which may be maintained and operated by specific state agencies or institutions or by vendors or others.

TELECOMMUNICATIONS MANAGEMENT ISSUES

While there are examples of innovative applications of telecommunications technologies in the Commonwealth, much more effective use of telecommunications sytems needs to be made–both in simple information transfer and in the application of these systems to program delivery. Effective use of telecommunications can save the Commonwealth millions of dollars and, may allow service to citizens in ways not now possible. But before these new uses can be implemented, some fundamental problems with current management systems must be resolved.

Rapid Technological Growth

Today, a silent revolution is taking place which will bring vast changes to all aspects of human interaction. This revolution, in the field of microelectronics and other related technologies, provide the physical means of expanding and speeding human communication. The results are already outstanding. Today, the human voice can be carried with the speed of light in tiny conduit-like threads of a cheap and abundant glass fiber material which eventually will be woven into our world as nerves similar to those that specialize every part of the human body. Computers, once necessarily complex and large, now perform the same calculations on top of the desk at faster speeds with better, less expensive and more efficient operation.

In Virginia there is no demonstration of the potential of these technologies. Managers are being asked to make both communications and operational (program) decisions affecting their systems without prior training in either system operations or potentials.

Telecommunications Inventory

The Governor's Office is hamptered by lack of basic information concerning telecommunications hardware. This often results in duplicative services and wasted resources. Moreover, no comprehensive analysis of total system effectiveness is possible.

Control

Presently, no central guidelines, standards or procedures concerned with the operation or maintenance of telecommuncations systems exist. Several cooperaive inter-agency maintenance arrangements however, are in effect, such as formalized maintenance agreements between the Department of State Police and several state agencies for maintenance of fixed and mobile radio facilities.

In the past, OGTS common carriers contracts, notwithstanding, state agencies independently negotiated for communications services. Separate negotiations increase equipment procurement expense because equipment costs decline as equipment procurement increases. Agencies purchasing small amounts of equipment independently spend considerably more per unit than is necessary. Purchasing in small quantities also increases the cost of repair and inventories.

Comprehensive Planning and Coordination

For all practical purposes, it is difficult to separate the function of coordination from that of planning. Under the Master Plan for Telecommuncations, the State has achieved only a very limited measure of coordination of telecommunications facilities and functions.

The Master Plan has not been updated to apply to new, previously unmanaged, areas of State

concern. Some approvals of higher educational institution master plans has been accomplished but no evidence was found of the effective use of these plans to accomplish statewide goals or objectives.

Methods

Agencies are left largely to their own in the procurement and maintenance of their expanding telecommuncations systems. There is no process or procedure for coordination, cross use or exchange of equipment.

Use of a standardized telecommunications order forms to control telecommunications systems change or expansions would bring efficiency to the system. These forms, coupled with use sensitive cost accounting, would do much to aid in agency and statewide coordination.

Privacy and Freedom of Information

All telecommuncations decisions should take proper cognizance of privacy rights. Individual liberties may be threatened by some applications of telecommunications. Electronic data collection and transfer, for example, presents constant challenges to traditional legal rules in matters of individual privacy and freedom of (access to) information.

The legal doctrines of privacy and of freedom in information are closely intertwined in the problems of data collection and access, particularly in the processes of governmental data collection from governmental intrusion and unauthorized dissemination of private information. Similar problems are increasingly evident in private and commercial data collection and use.

Research and Demonstration

A research capacity housed in a central state telecommunications agency, is essential to the state's effective use of telecommunications technologies. This research organization would be able to evaluate existing and emerging technology as to capacity, and through demonstration projects apply these technologies to real operating problems.

A research and innovation organization should also include technical expertise to evaluate equipment as well as management expertise to allow demonstrations, pilot provisions and the specific application of technologies. The only effective method of finding out what telecommunications technologies will work and which are cost effective is to test the hardware and the associated software in the field. This kind of testing and operational use allows technologies to be evaluated sufficiently and pre-tested before agencies and institutions make widespread and potentially costly communication systems investments.

The Legislative/Statutory Perspective

The legislative/statutory perspective is characterized by a perceived lack of quality and effectiveness in the management of the State's telecommunications systems and the perception that these concerns are not reflected adequately in the statutes and organizational charters.

The 1976 General Assembly enacted legislation implementing recommendations of the commission on State Governmental Management as they pertained to administration and finance agencies. The Act created the position of Director of the Department of Support Services (later changed to General Services) and called for preparation of a plan to organize such a department.

The implementation study that was undertaken (and the eventually resulted in the creation of the Department of General Services) included provisions for a State telecommuncations agency. It further provided that:

"The Virginia Public Telecommunications Council should be abolished and replaced by a "council on public telecommunications" to be established to function in an advisory capacity to the director and to the appropriate division head of the department."

Implementation of these provisions was suspended pending the recommendation of the Telecommunications Study Commission.

Twenty-six:

In order to provide necessary legislative oversight and to assist in the implementation of the recommendations contained in this final report, we recommend that the Telecommunications Study Commission be continued until December 31, 1980. The Commission's function would extend to interpretation of these findings and recommendations to the individuals and/or groups assigned to

a. develop organization and management plans to implement the recommendations in this report

b. approve the comprehensive plan recommended in this report

c. provide assistance to State executives delegated responsibilities for items a and b

Twenty-seven:

We recommend that systems of management control and coordination be developed to insure that:

A. economies of scale can be achieved in telecommunications equipment purchases

B. shared use is made of all appropriate state owned or leased facilities equipment or system

C. operational control of telecommunications facilities is centralized in the Department of Telecommunications.

D. central management policies be established for maintenance of telecommunications equipment whether the maintenance be performed by state agencies or vendors

E. coordination among telecommunications users is achieved

F. published procedures, standards and guidelines are disseminated to guide agency actions in managing the development and efficient use of their telecommunications facilities

G. control over agency telecommunication acquisition is achieved

H. in-use systems are subjected to continuing evaluation

I. the rights of citizens and officials to information are maximized and that rights of privacy are protected.

CHAPTER SIX

FINANCIAL MANAGEMENT

INTRODUCTION

As stated, the main focus of this research is the state's telecommunications management and policies. A discussion of financial mechanisms, however, helps put the state's management and policies in perspective.

Collectively, the state spends nearly $50 million dollars annually for telecommunications. Approximate expenditures in FY 1979 include:

$40 million for telephone services

$5 million for data communications

$250,000 for public television stations

$3.2 million for instructional television

$500,000 for land-mobile radio systems

$125,000 on minor systems such as teletypewriters and facsimile

$-0- for public radio stations

Efficient management of expenditures of this magnitude is imperative. However, there is no agency which monitors these state expenditures. VPTC, in actuality, manages only ITV contracts and portions of telephone expenditures. OGTS's working capital fund is effective only for telephone cost accounting and financial planning. The effective use of this mechanism combined with centrally designed and shared telecommunications facilities results in significant savings. Moreover, these mechanisms can provide efficient management tools and sources of revenue.

TELEPHONE

OGTS manages one-third of the state's $40 million dollar telephone service expenditures. This centralization has reduced agency costs (i.e., where OGTS has assumed responsibility, agency cost per employee has dropped from $400 to $331).

Inflation and service expansion will account for rising state expenditures in the future for telephones. Total costs by 1982 are predicted to approximate $53 million dollars with OGTS controlling half of the expenditures.

As previously stated, the financial accounting mechanism for telephone service is the working capital fund. The advantages of this mechanism are only partially realized. In addition, centralized billing needs to be improved. These two financial management tools, if used appropriately, would result in an efficient centralized management for the state.

The Working Capital Fund

The working capital fund is a cost accounting mechanism for intra-agency service and equipment exchanges. Money for the capital fund is initially generated by account transfers, general obligation bonds or direct appropriations. A supporting agency purchases services or materials direct from suppliers and then bills the user agencies. A surcharge is added to the bill for services rendered. User agencies pay with interagency fund transfers. This money is used by support agencies to purchase additional services and equipment. Ideally, the working capital fund recovers the total costs of operations with no surplus or deficit.

Use of a working capital fund allows the Commonwealth to coordinate telephone services and monitor expenditures. Each agency is billed both for direct charges and a pro rata share of VPTC's operating expenses. This arrangement discourages unnecessary purchases of service and equipment. Moreover, agencies are given accurate expense figures and the state's aggregate costs are obtainable.

Although the use of a working capital fund results in more paperwork and administrative costs,

a direct appropriation system would result in an understatement of each agency's actual telephone expenditures. Furthermore, direct appropriation would not provide incentive for fiscal restraint.

The Billing Process

OGTS bills user agencies monthly for telephone services. Comprehensive bills are compiled from tapes, sent by common carriers, which contain user agency service and facility costs. OGTS analyzes costs so that each Centrex area user receives a cost breakdown on individual items, all of which are usage sensitive, and include:

mainline service - this bill includes charges for the individual phones. The cost per line for Centrex varies from $18.20 per month (Norfolk) to $21.10 per month (Lynchburg).

direct service - this item includes the costs of trunklines, data lines, extension phones, key systems and similar options.

SCATS - this charge is based on the minutes of use and pro rates to all users.

other charges and credits (o & c) - this bill includes all installation charges.

long distance tolls - this includes bills for all long distance calls not made on the SCATS. Examples of charges include card calls, operator-assisted calls, and overseas calls.

In addition to the above, a surcharge is added to pay for OGTS's operations. The surcharge consists of a flat 4.5% charge on SCATS and an additional mainline charge which varies for different Centrex areas and is adjusted quarterly.

Agencies pay telephone bills to OGTS by account transfers. When OGTS has sufficient balance in its account, the common carriers are paid. An agency failure to transfer funds necessitates OGTS having to collect the bill. However, OGTS has no procedures manual for this process, which results in much confusion.

Surcharges do not reflect agency telephone costs in relationship to the benefits of service provided by OGTS. For example, individual agencies are not charged for consultant services directly. Thus, inequities developed since individual agencies may obtain benefits from the service, but all agencies must pay the costs. It appears that direct charges to the agency receiving the benefit would be more equitable.

Centrex Consolidations:

Presently there are seven consolidated telephone systems which provide most state agencies with uniform, coordinated service. Rates for Centrex services are set by OGTS with data provided primarily from the common carrier.

Centrex significantly reduces the need for personnel to operate switchboards, which cuts costs to agencies in particular and the Commonwealth in general. Moreover, Centrex consolidations have led to more efficient telephone service by facilitating transmission.

The Communications Management Information System (CMIS) developed by the Department of Management Analysis and Systems Development is an attempt to automate OGTS's financial management procedures. A major recommendation of CMIS is that OGTS should monitor TELPAK rather than rely on C&P for advice concerning items such as line requirement and systems cost effectiveness. This recommendation appears to have merit. Pennsylvania, for example, has realized 20% savings by monitory telpak. A major emphasis of CMIS is the streamlining of OGTS's billing procedures. Presently, each bill must be processed separately which results in complex accounting procedures, increased administrative costs, and present difficulties in calculating total costs.

OGTS Role in Financial Planning

The time consumed by OGTS staff in administrative operations precludes time for budget or systems planning. Since OGTS is charged with control over telecommunications, their involvement in these matters is imperative. The advantage of this type of involvement is significant. For example,

because telecommunications is a technical field, agencies seldom have staff expertise to determine future needs and expenditures. Furthermore, it is illogical to develop individual agency expertise because of duplicative services and increased costs.

As started, OGTS's limited staff precludes it involvement. The lack of staff is one of the causes of OGTS's failure to serve in many critical management functions. It appears that increased personnel costs will be more than offset by more efficient and effective telecommunications services.

FINANCING INSTRUCTIONAL TELEVISION

ITV funds, appropriated by the State, are disseminated by VPTC. VPTC determines contract services, based on available funds for PTV stations in cooperation with RSCPC.

Regional RSCPC's meet on a regular basis to prepare service proposals for individual stations which include programming, tape duplication, program production, maintenance, and printed teaching materials. Service contracts are then negotiated by VPTC with representation from DOE and appropriate stations.

The role of VPTC vis a vis DOE concerning PTV contracts is not clear. VPTC has on occasion disagreed with portions of DOE's PTV proposals for reasons not readily apparent. The crux of the problem is that although DOE is ultimately responsible for state education, VPTC has responsibility for the allocation of funds to support some aspects of education (i.e., ITV funds).

VPTC handling of ITV contracts has been the subject of some criticism which centers around costs incurred for overhead and depreciation. Some individuals feel that these costs are not justified for the services delivered.

DOE is involved with ITV through two of its departments - the Bureau of Teaching Materials and the Division of Telecommunications. The Bureau of Teaching Materials budgets $18,000 annually for the operation of a videotape library and distribution system. All the expenditures made by the Division of Telecommunications ($250,000 annually) are spent on ITV. Specific areas of expenditures are unknown. However, it is known that instruction funds are provided for items such as Telecommunications coordinator's salaries and the purchase and maintenance of video equipment.

VPTC will expend approximately $3 million for instructional television in FY 1979-80. In addition, approximately $145,000 is budgeted for VPTC salaries and operating costs.

In FY 1979-80 VPTC will award approximately $566,000 in facility grants. These funds will be matched 50/50 from other sources and used for the installation of transmitters and translators. These grants will provide both PTV and ITV service.

PTV stations in FY 1979-80 will receive almost $3 million from VPTC ITV contracts. This money is paid for services rendered. Table 1 shows each station's contract expenditures. Over 3.2 million dollars will be spent by VPTC and DOE for ITV in FY 1979-80.

TABLE 1

Telecommunication Services Contract for Instructional Television

PTV Entity	1979-80 Contract
Central Virginia ETV Richmond WCVE/WCVW	$ 783,230
Central Virginia ETV Annandale WNVT	$ 520,900
Hampton Roads ETV Norfolk WHRO	$ 590,000
Blue Ridge ETV Roanoke & Norton WBRA/WSVN	$ 517,300
Shenandoah Valley ETV Harrisonburg WVPT	$ 476,600
Reserve for later distribution	$ 28,160
TOTAL APPROPRIATION	$2,916,190
(Budget Requests)	(3,157,920)

Historically, state funds for instructional services have been provided through the ITV contract. PTV appropriation for 1979, however, was $250,000 which is a clear indication that the state recognized the importance of PTV, since, its expenditures traditionally have been limited.

DATA COMMUNICATIONS

The Commonwealth spends approximately $5.0 million annually for data communications (approximately $2.5 million of this is for higher education.) It is estimated that this figure is increasing 20% per annum. All cost figures are estimations, because OGTS does not calculate total data communications costs. A major event effecting data communications expenditure is the fact that the cost of computer hardware has dropped dramatically in recent years. This fact combined with the pervasive idea that bigger is better has resulted in the proliferation of stand-alone facilities (this is particularly true for mini and midi computers). Stand-alone computers are not inherently bad. However, it is essential that a need assessment be completed on stand-alone requests. The reason for this is that while computer hardware costs have dropped, computer software costs and the personnel needed to operate stand-alone capacities have skyrocketed. Furthermore, the Commonwealth, because it's not salary competitive, has problems attracting and keeping quality computer personnel.

OGTS does not coordinate data communications procurements for State agencies and institutions or advise and consult with DMASD and DCS regarding data processing and communications procurements. There appears to be a need to investigate the possibilities of having a single contracting point so that State agencies and institutions may obtain cost effective data communications services or equipment in an expeditious manner. This need will become more critical in the future as increasing amounts of data communications hardware and software become operational. A single contracting point will reduce the agency's need to separately bid, evaluate and contract for common data communications equipment and services. Moreover, through statewide procurement economies of scale might be realized (assuming that equipment compatibility and user needs are considered in state policy).

Telecommunications Systems

The costs associated with small telecommunications systems are difficult to determine because there is no centralized financial management agency currently undertaking this task. In addition, there are no consolidated records of expenditures by individual agencies to help develop effective statewide policies.

Teletypewriter Expenditures

OGTS has responsibility for planning, managing and coordinating teletypewriter (TTY) equipment and services for state agencies and institutions. The state spends approximately $3,000 a year on teletypewriter hardware not including TWX service or telephone transmission costs. This low figure is reflective of (1) limited state TTY application, (2) the fact that teletypewriter equipment for the deaf is usually surplus and (3) the fact that much of the teletypewriting equipment needed is already in place.

TWX service costs the State 40 thousand dollars in fiscal years 1978-1979. This figure includes all costs. It should be noted that all cost figures are estimates and because OGTS does not figure collective TTY costs or the value of hardware in place.

Better utilization of SCATS billing rates could be otbained from TTY transmissions. SCATS arrangements are in effect 24 hours per day, however, most state use occurs between 8 a.m. and 5 p.m. on weekdays. TTY transmissions could be scheduled for off hours and weekends to effectuate better utilization of SCATS both from increased use and by relieving congestion during peak voice times.

Facsimile Expenditures

Xerox dominates the market for facsimile telecopiers, providing 95% of all state facsimile equipment. Virginia has approximately $250,000 worth of equipment in place. About 80% of all facsimile equipment is acquired on lease purchase arrangement through DPS.

Xerox negotiates an annual facsimile contract with the Federal General Services Administration and then offers the same agreement to the Virginia DPS. State agencies and institutions make requests for facsimile equipment to DPS which then secures the most favorable vendor bid. It costs the State approximately $50,000 (not including telephone costs) annually for facsimile transmission. As was true for teletypewriters, all cost figures are estimations since the State does not figure collective facsimile costs or manage and plan for cost effective use of these systems.

Land Mobile Radio

Most state users of paging purchase units ($18 to $27 per month) through a radio common carrier. A pager unit costs between $200-$360 per unit depending on the options desired.

In addition to the unit price, users usually pay an installation fee (approximately $25) as well as $6.50 to $13.00 per month for radio transmission and telephone interface costs. Some users, particularly private system users, purchase their own equipment directly from the vendor and are responsible for maintenance costs. Other state agencies (e.g., MCV/VCU Hospital) sign purchase/lease arrangements for paging equipment and payments are usually spread over a five year period.

There are no exact figures available on the State's investment and current expenditures for paging equipment and services. It is estimated that Virginia has between $300,000 to $1,000,000 worth of paging equipment (including support equipment) in place. In addition, it is estimated that the State spends approximately $165,000 per year for paging service.

State agencies purchase land mobile equipment through DPS. Under Virginia Code, any purchase exceeding $250 must go to competitive bid. DPS established equipment performance specifications (e.g., minimum range requirements), advertises request for bids periodically, and then selects the lowest bidder meeting these specifications. Individual agencies then establish their own vendor contracts based on approved bid specifications. The main objectives of this procedure are to reduce the agency's need to separately bid, standardize equipment, and achieve volume discounts. In some cases, such as the State Police, the agency develops the specifications and there is a separate bid process. Table 2 shows the major users and estimated hardware procurement costs for existing two-way radio systems of selected state agencies.

TABLE 2

Use of Land Mobile Radio in Major State Agencies

Agency	Mobile Sets	Portable Sets	Estimated Value of all equipment
Emergency and Energy Services	10	3	$ 15,000
Dept. of Agriculture	19	0	N/A
Division of Parks	32	0	90,000
Alcoholic Beverage Control	40	18	100,000
Water Control Board	45	0	50,000
Game Commission	361	59	540,000
Division of Forestry	584	229	1,750,000
Highways and Transportation	910	5	1,500,000
Department of Corrections	1000	500	1,000,000
State Police	1400+	1400	6,243,650
TOTAL			$11,289,045

Twenty-eight:

The working capital fund should be expended as a financial management tool to include all state telecommunications activities.

Twenty-nine:

Surcharges should be expended to include all the direct costs a central state agency incurs in the planning, management and coordination of telecommunications.

Thirty:

User bills should be only for services actually rendered. These usage-sensitive bills will facilitate effective cost accounting and aid both individual agencies and the Commonwealth in planning expenditures.

Thirty-one:

Feasibility studies should be completed to determine the potential for expanding SCATS and Centrex consolidation.

Thirty-two:

Computer based systems should be expanded to include all facets of telecommunications.

Thirty-three:

Financial management and planning should be conducted for all aspects of telecommunications.

Thirty-four:

Current methods of providing support for general public television should be continued. The current method of using contracts for ITV service including growth, depreciation and overhead figures should be continued. Consideration of a major enhancement of the authorization (1979 session) that is presently used for community service grants should also be given by the legislature. PTV grants under this system would be administered by the Virginia Public Broadcasting Board in accordance with appropriate standards and guidelines.

Thirty-five:

We recommend that capital grants and community services grant programs be continued and that a research and planning grants program be initiated.

CHAPTER SEVEN

COMPREHENSIVE PLANNING FOR TELECOMMUNICATIONS

INTRODUCTION

The need for a coherent and consistent master plan for keeping pace with changes in telecommunication is a state imperative. The importance of such a plan is revealed by study. While the Master State Plan for Telecommunications has served this function to some extent, it no longer meets the changes in the telecommunications situation in Virginia. A comprehensive medium to long-term telecommunications plan reflective of current needs, current technology and current state programs is needed.

FUTURE PLANNING

A comprehensive plan for telecommunications should be a flexible plan of action; and it should be monitored, reviewed and updated on a regular basis. At least five major elements must be included in future planning for telecommunications in Virginia. These include the following:

1. Research - Any comprehensive plan which serves Virginia must include a research element. This research should center around the identification of new applicable technology. The idea of research awareness may mean that a government agency will gear up to carry out the research. It may also involve grants to private or quasi-public research institutions. The key element is that Virginia recognize the importance of telecommunications research and actively pursue a level of awareness.

The benefits derived from these research efforts may be of two types: first, benefits which lead to technological innovation which might change delivery systems; and, secondly, benefits derived from the identification of new and innovative approaches to existing systems.

2. Goal setting - Central to comprehensive planning is the identification of goals and objectives that can be used as operational guides to state officials at all government levels. Comprehensive planning must focus attention on future goals and targets and strategies for their realization. In telecommunications planning in Virginia today, this need is an especially important one - the users and applications of modern telecommunications technologies hold much promise for the improved, cost effective operation of most government service programs.

3. Needs Assessment - If Virginia hopes to serve its citizenry well, planning strategies must be flexible enough to meet the changing demands and needs of telecommunications users. A comprehensive plan for telecommunications must contain the mechanisms for a continuing user needs assessment. Consistent with this ongoing needs assessment task is the recognition that an evaluation of telecommunications activities must be conducted. Systems evaluations assist user agencies in maintaining effective and efficient telecommunications systems.

4. Coordination - A comprehensive plan for telecommunications should include a concern for the most effective and economical approaches to serving user agencies. Appropriate research, evaluation, and needs assessments will provide the necessary information needed to make appropriate planning and management decisions in a coordinated manner. The primary goal of coordinating statewide management is not to remove telecommunications responsibilities from agencies, but, rather to reduce total state costs without effecting services delivered to individual agencies of government. This element of a comprehensive plan may not be readily acceptable to agencies wishing to maintain and even expand existing single agency systems. Thus, it is critical that a central state agency charged with implementation be given appropriate legislative authority to carry out their functions from a statewide perspective.

5. Funding and staff - A comprehensive plan must include appropriate funding mechanisms. A major weakness of the present plan for telecommunications is the lack of a clearly defined approach to multiyear funding.

NEW TECHNOLOGICAL DIRECTIONS

Virginia is on the verge of seeing major applications of telecommunications systems to government programs. A series of profound technological advances has virtually assured that government operations will be permanently altered. While the pace of this change (e.g., evolutionary

or revolutionary) is the subject of some disagreement, the fact of change is accepted by all experts. Opportunities for applying technology to government programs and service delivery mechanisms continue to arise. Comprehensive planning for telecommunications in Virginia is needed to apply some of the following technologies:

1. Application of Digital Technology - The application of digital technology will produce equipment that not only has data and voice transmission capabilities, but which is miniaturized as a result of microprocessing technologies which can reduce the size of terminals and greatly increase their functions. Production of this equipment will increase in the future along with an increased need for these machines to communicate electronically.

As microprocessor functions are dispersed and intelligence is provided to terminals, front-end processors, and circuits, the distinctions between data communications and data processing has become less important. The advent of digital data communication will prevent many of the problems associated with voice grade transmission and greatly improve the efficiency of data communications. Commonwealth plans must consider this technology.

2. Electronic Mail - With new technology, hardcopy materials now sent through the mail will be able to be transported as efficiently as voice messages now are transmitted over telephone. Information processors are now being developed that will transmit letters typed on a word-processing machine to a remote receiver. Additional features of these processors include reproducible hard copy and memory storage: the so-called electronic mailbox. As an example, the United States Postal Service is readying a nationwide system of 25 computerized printing and delivery centers to supply electronic customer billing services to subscriber corporations. The program (called ECOM) will transmit, fold, envelope and deliver bills to the subscriber's customers faster and less expensively than current first class postal delivery.

3. Optical Fiber Technology - Optical or glass fibers conducting light waves (e.g. laser beams) are a new development in communications technology. The advantages of optic fibers are their light weight, small diameter, high capactiy, low transmission loss and an insensitivity to electro-magnetic interference. Optical fibers are an attractive alternative to expensive and increasingly scarce copper wire used in traditional telephone systems. They may be an alternative delivery system for voice, data and video signals. It may prove economically feasible to bring a switched, two-way optical system to residential subscribers in the new future. At that point, a single integrated network for the distribution of television as well as telephone services may be preferable to maintaining separate systems.

4. Satellite Systems - Although digital technology will change the nature of voices and data communications, the basic components such as switches and wires will remain unchanged. Satellite communication, conversely, bypasses this hardware. Traditionally, satellite communications systems have been cost beneficial only for high traffic volumes between large earth terminals. However, the declining costs of earth stations may encourage small volume uses. Advantages of satellite communications systems include access to remote areas, multi-point teleconferences, and emergency alternatives to traditional land-based communications.

Satellite transmission presently is being utilized for radio and television networks. As is true for telephone voice and data communications, this use is becoming cost effective for low volume users. These changes are making satellite transmission a viable state planning option.

5. Computer and Component Technologies - As a result of the convergence of data communications and data processing, a great amount of new hardware and software data communications equipment and services are now emerging. Some of this technology includes intelligent terminals and front-end processors (performing numerous data communications functions). The Commonwealth needs to watch this evolution of this technology carefully.

6. Videodisc - Television technology has made great strides with the perfection of videodisc technology. Discs permit inexpensive duplication, quality visuals, reduced storage requirements, and lower maintenance costs. Moreover, discs provide operational capabilities not available in current video systems.

In the future, disc uses will see new instructional and information storage applications. The full impact of videodisc on telecommunications in Virginia is not known; however, it is clear that

Virginia should be prepared to make decisions concerning use of this technology.

REGULATORY AND INDUSTRIAL CHANGES

Besides technological change, pending legislative change will significantly affect telecommunications in the future since communications continues to be a field where new trends are as much a creature of politics as technology. Legislation currently being considered by Congress could have a significant impact on telecommunications.

Specialized common carriers may not be subjected to inter-exchange regulations, although AT&T will still be regulated. Thus, only marketplace competition will be an influencing factor. In order to offset increased costs of local services caused by inter-exchange, access fees will be charged to specialized common carriers.

Another factor likely to affect the telecommunications environment is fierce competition between America's industrial giants (AT&T, IBM, Xerox, and RCA) to establish data communication networks. The outcome of this "corporate star wars" depends on Congress, the FCC, and the competitors themselves. Regulatory approvals center around public interest issues such as regulatory jurisdiction, competiton vs monopoly, and pricing cross-subsidies. the issues involved are complex, and only the extremists claim to know all the answers to all the questions raised by the emergence of the data communications networking industry.

Telemedia is also the subject of regulatory changes. A recent court decision has eliminated a requirement that cable companies must provide public access channels. This decision does not preclude the provision of channels, but it does mean that individual states or municipalities may have to use alternative channel acquisition.

The nature of the television industry in general is also changing. For example, individuals traditionally have been able to organize their own networks. The PBS has recognized changing use requirements and will now provide four channels of programming for PTV. Virginia must be in a position to adjust to this type of change.

THE IMPACT OF TELECOMMUNICATIONS CHANGES IN VIRGINIA ENVIRONMENT

Changes in the telecommunications environment can be expected to affect Virginia's governmental affairs in a number of ways, such as:

1. Increased Mixture of Voice, Data and Image Communications: As systems become digitized, alternatives to mail, messenger, and personal meetings will be possible. New applications will be faster and less expensive.

2. Application of the "Office of the Future" Technology: Microprocessor-equipped machines linked by communications lines are presently and will continue to revolutionize office activity with features such as communicating word processors, electronic filing systems, and dictation machines capable of processing and storage. The main advantages of these new systems include increased speed, reduced costs, and reduced space requirements.

3. Reduced Travel Requirements: The central question concerning the substitution of telecommunications for travel is not whether a significant amount of energy can be saved by substituting telecommunications for travel, but whether it is likely that substitution will be made to a significant degree. Rising fuel costs and dropping telecommunications costs suggest that telecommunications will be an increasingly important alternative to travel in the future.

4. Increased Mobility of Information: Future communications networks may replace traditional information exchange media. For example, the British "Ceefax" system provides newspaper-like service over video networks to subscribers: The British Post Office provides a service known as viewdata by which viewers may use the Ceefax system for accession of governmental information (such as income tax assistance, assistance in securing a house loan, etc.). Many governmental operations increasingly involve the flow of information which could be adapted to telecommunications methods. Taxation, census taking, even voting may eventually be affected by

telecommunications, although serious questions concerning security, privacy, and costs remain to be answered. There is little doubt, however, that future governmental services will rely to an increasing extent on telecommunications.

CONCLUSIONS

Telecommunications is undergoing significant changes. These changes will impact many aspects of our daily lives. Governmental functions will also be affected. Statewide coordinated planning for telecommunications use, combined with innovative applications, are imperative. This type of activity will have a two-fold effect: first, it will improve Virginia's governmental services; and secondly, it will establish Virginia as a national leader in telecommunications.

RECOMMENDATION

Thirty-six:

We recommend that the current Master State Plan for telecommunications be re-written and that an executive branch task force be assembled to assist the new Department of Telecommunications to prepare a comprehensive long-term plan. Such a plan should cover all telecommunications technologies and extend to programs and services of all state agencies and institutions.

Respectfully submitted,

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APPENDIX

A BILL to amend and reenact §§ 2.1-51.27, 2.1-454 and 15.1-23.1 of the Code of Virginia; to amend the Code of Virginia by adding in Title 2.1 a chapter numbered 35.1, containing sections numbered 2.1-563.1 through 2.1-563.7, a chapter numbered 35.2, containing sections numbered 2.1-563.8 through 2.1-563.13; and to repeal Chapter 16.1 of Title 22, containing §§ 22-344.4 through 22-344.15; the amended, added and repealed sections creating a Department of Telecommunications, and a Virginia Public Broadcasting Board, and abolishing the Virginia Public Telecommunications Council.

Be it enacted by the General Assembly of Virginia:

1. That §§ 2.1-51.27, 2.1-454 and 15.1-23.1 of the Code of Virginia are amended and reenacted, and that the Code of Virginia is amended by adding in Title 2.1 a chapter numbered 35.1, containing sections numbered 2.1-563.1 through 2.1-563.7, and a chapter numbered 35.2, containing sections numbered 2.1-563.8 through 2.1-563.13 as follows:

§ 2.1-51.27. Agencies for which responsible.—The Secretary of Administration and Finance shall be responsible to the Governor for the following agencies: Department of Planning and Budget, Department of Management Analysis and Systems Development, Department of Computer Services, *Department of Telecommunications,* Department of Intergovernmental Affairs, Department of Personnel and Training, ~~Division of Engineering and Buildings,~~ ~~Division of Records,~~ Department of ~~Property Records and Insurance~~ *General Services* , ~~Department of Purchases and Supply,~~ ~~Virginia Public Telecommunications Council,~~ ~~Division of Consolidated Laboratories,~~ Department of Taxation, Department of the Treasury, Department of Accounts, Compensation Board, Virginia Supplemental Retirement System, Board of Elections, Treasury Board, and State Commission on Public Debt. The Governor may, by executive order, assign any other State executive agency to the Secretary of Administration and Finance, or reassign any agency listed above to another secretary.

§ 2.1-454. Aid and cooperation of Division may be sought by political subdivisions; nonprofit telecommunications entities and local officers in making purchases; use of facilities of central warehouse.—The boards of supervisors, or other governing bodies, of political subdivisions, the several counties and the councils of the several cities and towns, the governing bodies of ~~educational television~~ *nonprofit telecommunications* entities in Virginia and the officers of counties, cities, towns, political subdivisions and ~~educational television~~ *nonprofit telecommunications* entities who are empowered to purchase material, equipment and supplies of any and all kinds for local public or ~~educational television~~ *nonprofit telecommunications* use, may, in their discretion, seek the aid and cooperation of the Division of Purchases and Supply in purchasing such material, equipment and supplies, to the end that, by central purchasing, cheaper prices may be obtained. When any such governing body of a county, political subdivision or ~~educational television~~ *nonprofit telecommunications* entity, council of a city or town, or duly authorized officer or officers of a county, city, town, political subdivision or ~~educational television~~ *nonprofit telecommunications* entity request the Division to obtain bids for any materials, equipment and supplies, and such bids accordingly have been obtained by the Division of Purchases and Supply, the Division may award the contract to the lowest responsible bidder, and such county, city, town, political subdivision or ~~educational television~~ *nonprofit telecommunications* entity shall be bound by such contract; the Division shall set forth in the purchase order that such materials, equipment and supplies be delivered to, and that the bill therefor be made out to and forwarded to such county, city, town, political subdivision or ~~educational television~~ *nonprofit telecommunications* entity; any such bill shall be valid and enforceable claim against the county, city, town, political subdivision or ~~educational television~~ *nonprofit telecommunications* entity responsible, requesting the Division to seek such bids.

Notwithstanding any of the foregoing, any such political subdivision or ~~educational television~~ *nonprofit telecommunications* entity shall have the right to reject all bids without any liability unless said political subdivision or ~~educational television~~ *nonprofit telecommunications* entity purchases the same or similar item or items upon which such bids were taken within a period of three months thereafter from someone other than the bidder to whom the order was awarded at the bid price. Whenever all bids have been rejected by the political subdivision or ~~educational television~~ *nonprofit telecommunications* entity, it may again call for bids on the same or similar items through the Division of Purchases and Supply, with the approval of the Division.

The Division shall encourage the seeking of such aid and cooperation by the tender of its services by letter, and otherwise, and especially by the dissemination of facts by letter or otherwise, concerning the savings of public funds which may be effected by central purchasing of materials, equipment and supplies.

Upon request of the governing body of any county, city, town, or other political subdivision or ~~educational television~~ *nonprofit telecommunications* entity, or any duly authorized officer thereof, ~~the Division may make~~ available to any such county, city, town, other political subdivision or ~~educational television~~ *nonprofit telecommunications* entity the facilities of the central warehouse maintained by the Division; provided, however, that the furnishing of any such services or supplies shall not limit or impair any services or supplies normally rendered any department, division, institution or agency of the State.

The Virginia ~~Public Telecommunications Council, continued pursuant to § 22-344.6,~~ *Public Broadcasting Board* shall furnish to the Division of Purchases and Supply a list of ~~educational television~~ *nonprofit telecommunications* entities in Virginia for the purposes of this section.

CHAPTER 35.1.

DEPARTMENT OF TELECOMMUNICATIONS.

§ 2.1-563.1. Definitions.—As used in this chapter:

1. "Telecommunications" means any origination, transmission, emission, or reception of signs, signals, writings, images, and sounds or intelligence of any nature, by wire, radio, television, optical, or other electromagnetic systems;

2. "Telecommunications services" means noncommercial, nonprofit telecommunications to serve the Commonwealth in its delivery of services or movement of information;

3. "Telecommunications facilities" means apparatus, equipment, and material necessary in the nonprofit production, distribution, or interconnection of electronic communications, including the buildings and structures necessary to house such apparatus, equipment, and material, and the land necessary therefor;

4. "Department" means the Department of Telecommunications;

5. "Board" means Virginia Public Broadcasting Board;

6. "Fund" means the Telecommunications Working Capital Fund.

§ 2.1-563.2. Department created; appointment of Director.—There is hereby created a Department of Telecommunications. The Department shall be headed by a Director who shall be appointed by the Governor, subject to confirmation by the General Assembly. The Director shall hold his position at the pleasure of the Governor.

§ 2.1-563.3. Powers and duties of Director.—The Director of the Department shall exercise such powers and perform such duties as are conferred or imposed by the law upon him; and he shall perform such other duties as may be required of him by the Governor.

§ 2.1-563.4. General powers of Department.—The Department shall have the following general powers:

1. To employ such personnel as may be required to carry out the purposes of this chapter.

2. To make and enter into all contracts and agreements necessary or incidental to the performance of its duties and the execution of its powers under this chapter, including, but not limited to, contracts with the United States, other states, agencies and governmental subdivisions of Virginia.

3. To accept grants from the United States government and agencies and instrumentalities thereof and any other source. To these ends, the Department shall have the power to comply with such conditions and execute such agreements as may be necessary, convenient or desirable.

4. To do all acts necessary or convenient to carry out the purposes of this chapter.

§ 2.1-563.5. Duties of Department.—The Department shall have the following duties:

1. To manage and coordinate the use and operation of telecommunications services and facilities, teletypewriters, facsimile systems and land mobile radio systems by the agencies and institutions of the Commonwealth, including the development of operating procedures and guidelines and the maintenance of an inventory of such systems;

2. To promote, sponsor, fund and conduct research and demonstration projects pertaining to all facets of telecommunications;

3. To analyze, review and approve all specifications for interconnective telecommunications facilities and network devices sought by an agency or institution of the Commonwealth;

4. To review and approve the procurement of any and all telecommunications facilities and services needed by State agencies and institutions, including the criteria and standards for the purchase of such facilities and services; and to supervise the relationships between vendors and State agencies and institutions;

5. To assist the various political subdivisions of the Commonwealth in matters pertaining to cable television and other forms of telecommunications;

6. To provide technical assistance to State agencies on any and all matters pertaining to telecommunications;

7. To recommend to the Governor policies pertaining to the development, procurement, management, or use of telecommunications by the Commonwealth;

8. To carry out any tasks assigned it by the Board;

9. To perform any additional duties assigned it by the Governor;

10. To promulgate regulations to carry out the provisions of this chapter;

11. To develop, amend, and otherwise be responsible for the State Master Plan for Telecommunications; provided, however, that the Board shall be responsible for approving amendments to those portions of the Master Plan which pertain to public broadcasting, as defined in § 2.1-563.9 2. of the Code of Virginia;

12. To apply for, accept, administer, and assist other State agencies and local governments in applying for federal and other funds, grants, gifts, and contributions available to support and promote the purposes of this chapter;

13. To do all other things necessary and proper to carry out the provisions of this chapter.

§ 2.1-563.6. Working Capital Fund.—A. There is hereby established a Telecommunications Working Capital Fund to be used exclusively to finance all operations and staff of the Department of Telecommunications. This fund is established by law, separate and apart from all other public moneys.

B. All users of telecommunications services administered by the Department shall be assessed a surcharge which shall be deposited in the fund. This surcharge shall be an amount sufficient to allow the fund to finance all operations of the Department.

C. All moneys existing in the Virginia Public Telecommunications Council Central Telephone Working Capital Fund are hereby transferred to the Telecommunications Working Capital Fund.

D. Additional moneys necessary to establish this fund may be advanced from the general fund of the Commonwealth of Virginia.

§ 2.1-563.7. State agencies to determine their telecommunications needs.—It shall be the responsibility of each State agency and institution to determine its telecommunications needs. The various agencies and institutions shall be assisted in this task by the Department.

CHAPTER 35.2.

VIRGINIA PUBLIC BROADCASTING BOARD.

§ 2.1-563.8. Purpose and intent.—It is the purpose and intent of the General Assembly:

1. To encourage the further development and growth of noncommercial educational public television broadcasting entities in the Commonwealth;

2. To support the expansion and development of public television and radio broadcasting and programming in all areas of the Commonwealth when reasonable and in the best interest of the Commonwealth.

§ 2.1-563.9. Definitions.—As used in this chapter:

1. "Board" means Virginia Public Broadcasting Board.

2. "Broadcasting" includes both television and radio transmissions as well as any appropriate related broadcast technology available to the general public as such technology develops.

3. "Fund" means Public Broadcasting Fund.

§ 2.1-563.10. Board created; functions; membership; appointments; terms; compensation; meetings; etc.—A. There is hereby created the Virginia Public Broadcasting Board in the Office of the Governor.

B. The Board shall be charged with assisting the various departments, agencies, and institutions of the Commonwealth and its political subdivisions, and the public broadcasting entities of the Commonwealth, in the construction, establishment, operation, and use of public broadcasting facilities, services, and programs.

C. Notwithstanding the provisions of § 2.1-42.1, the Board shall consist of fourteen members including the President of the Board of Education, the Chairman of the State Council of Higher Education, the Chairman of the State Board of Community Colleges, and the Chairman of the Board of Trustees of the Virginia Museum of Fine Arts. The remaining members shall be appointed by the Governor, one from each Congressional district of the Commonwealth, the appointments to be subject to confirmation by the General Assembly. Such members from Congressional districts shall be appointed for the following initial terms: two shall be appointed for a term of one year, two shall be appointed for a term of two years, three shall be appointed for a term of three years and three shall be appointed for a term of four years. Thereafter the successors of all appointed members shall be appointed for a term of four years each. Vacancies other than by expiration of term shall be filled by the Governor for the unexpired term. No member shall serve more than two consecutive four-year terms. No member of the Board may be the chief executive officer of any State agency, a member of the General Assembly, or an officer, director or employee of any local nonprofit telecommunications entity of the Commonwealth.

D. The Governor shall designate a member to serve as chairman and the members may elect from their number a vice-chairman.

E. The Board shall meet at least quarterly and at the call of its chairman.

F. Board members shall be reimbursed for their actual and necessary expenses for travel and subsistence incurred in performance of their duties as Board members away from their places of

residence. Such expenses shall be paid from such funds as may be appropriated for the purpose.

§ 2.1-563.11. Staff of the Board; Executive Director.—The Department of Telecommunications shall serve as staff to the Board and shall carry out all responsibilities assigned it by the Board.

§ 2.1-563.12. Duties.—The Board shall perform among others the following duties:

1. To recommend to the Governor and the General Assembly policies pertaining to the State's interest in public broadcasting;

2. To promote the effective development and use of broadcast technologies by the agencies and institutions of the Commonwealth;

3. To approve intermediate and long term plans with regard to public broadcasting within the Commonwealth;

4. To encourage and sponsor research and demonstration projects that seek to find ways in which broadcast and related technologies could help to solve the State's problems;

5. To receive and maintain information on public broadcasting facilities and services available in the Commonwealth;

6. To procure the temporary services of experts or consultants when such services are to be performed on a part-time or fee-for-service basis;

7. To require such reports and make such inspections and investigations as it deems necessary;

8. To serve as the liaison between the various agencies of the Commonwealth and the public broadcasting stations within the Commonwealth;

9. To allocate funds appropriated by the General Assembly for the purpose of promoting and otherwise aiding educational and other forms of public broadcasting;

10. To promulgate regulations to carry out the provisions of this chapter;

11. To do all other things necessary and proper to carry out the purposes of this chapter.

§ 2.1-563.13. Public Broadcasting Fund established; grants; applications for grants; moneys from Telecommunications Facilities and Services Fund transferred.—A. There is hereby established the Public Broadcasting Fund for the purposes of carrying out the intent of this chapter. The Fund shall consist of State appropriations and any other grants and gifts received by the Board.

B. The Board shall make grants from this fund for the following purposes:

1. To continue State support of the capital construction programs of public broadcasting entities within the Commonwealth;

2. To continue the State community service grant program for public broadcast stations;

3. To conduct and sponsor research into methods for improving public broadcasting services and the uses which might result from these improvements.

C. Applications for grants from the Fund shall be submitted in such form and manner as may be prescribed by the Board.

D. Any funds remaining in the Telecommunications Facilities and Services Fund shall be transferred to the Public Broadcasting Fund.

§ 15.1-23.1. Licensing, etc., and regulation of community antenna television systems.—The words "community antenna television system" as used in this section shall mean any facility which is operated to perform for hire, either in whole or in part, the service of receiving, amplifying, modifying or originating television, radio or other electrical signals for the purpose of transmitting

or distributing such signals by wire, cable or other means to subscribing members of the public, except that such definition shall not include (1) any system which serves fewer than twenty subscribers or (2) any system which serves only the residents of one or more contiguous apartment dwellings under common ownership, control or management, and commercial establishments located on the premises of such dwellings.

The governing body of any county, city or town may license, franchise or issue certificates of public convenience and necessity to one or more community antenna television systems, and impose a tax thereon; may regulate such systems, including the establishment of fees and rates, and assignment of channels for public use and operate such channels assigned for public use, or provide for such regulation and operation by such agents as the governing body may direct. In exercising the powers granted in this section, the governing body shall conform to minimum standards with respect to the licensing, franchising or the granting of certificates of convenience and necessity for community antenna television systems and to the use of channels set aside for general and educational use which shall be adopted by the ~~Virginia Public~~ *Department of* Telecommunications ~~Council created under chapter 16 (§ 22-231 et seq.) of Title 22 of the Code of Virginia~~ ; such minimum standards being for the purpose of assuring the capability of developing a statewide general educational telecommunications network or networks; provided, however, that the owner or operator of any community antenna television system shall not be required to pay the cost of interconnecting such community antenna television systems between political subdivisions.

2. That Chapter 16.1 of Title 22, containing §§ 22-344.4 through 22-344.15, is repealed.

3. That all rules and regulations adopted by the Virginia Public Telecommunications Council which are in effect as of the effective date of this act and which pertain to the subject of this act shall remain in full force and effect until altered, amended, or rescinded by the Department of Telecommunications or the Virginia Public Broadcasting Board, as appropriate.

4. That if any clause, sentence, paragraph, subdivision, section or part of this chapter shall be adjudged by any court of competent jurisdiction to be invalid, the judgment shall not affect, impair or invalidate the remainder thereof but shall be confined in its operation to the controversy in which the judgment shall have been rendered.

5. That the provisions of this act shall be effective on and after July one, nineteen hundred eighty.

SENATE JOINT RESOLUTION NO.....

Continuing the Telecommunications Study Commission; allocation of funds.

WHEREAS, the Telecommunications Study Commission was created pursuant to Chapter 653 of the 1978 Acts of Assembly; and

WHEREAS, the Commission was instructed to make a comprehensive study of the administration, use, and funding of telecommunications services by and within the Commonwealth; and

WHEREAS, the Commission has recommended significant changes in the way telecommunications services and funding are administered in the Commonwealth; and

WHEREAS, the Commission is anxious to see that its recommendations are properly interpreted and implemented; now, therefore, be it

RESOLVED by the Senate, the House of Delegates concurring, That the Telecommunications Study Commission is continued. The Commission shall review the organizational plans designed for the Department of Telecommunications and the Virginia Public Broadcasting Board as well as revisions to the Master State Plan for Public Telecommunications.

All agencies of the State shall assist the Commission in its work upon request.

The current membership of the Commission shall continue to serve. If any vacancy occurs, a replacement shall be made in the same manner as the original appointment. Members of the Commission shall be compensated at the rate of fifty dollars per day for each day spent on Commission business, and shall also be reimbursed for necessary and actual expenses in connection therewith.

For such expenses as may be required, the balance of funds previously allocated to the Commission by the General Assembly are hereby reallocated for the purposes of this study.

The Commission shall make its final report to the Governor and General Assembly on or before December one, nineteen hundred eighty.

SENATE JOINT RESOLUTION NO.....

Requesting the Virginia Public Broadcasting Board to study public radio.

WHEREAS, the Telecommunications Study Commission was created pursuant to Chapter 653 of the 1978 Acts of Assembly; and

WHEREAS, one of the responsibilities assigned to this Commission was to evaluate the use and the effectiveness of public telecommunications services in the Commonwealth; and

WHEREAS, the Commission was also asked to make recommendations as to the most cost-effective use of public telecommunications in the Commonwealth; and

WHEREAS, the Commission found public radio to be an excellent, albeit underutilized, telecommunications device; and

WHEREAS, an increased reliance on public radio may necessitate the increased use of State funds; now, therefore, be it

RESOLVED by the Senate, the House of Delegates concurring, That the Virginia Public Broadcasting Board is requested to study the ways in which public radio can serve the Commonwealth, and the extent to which and the means by which the State should be involved in supporting this form of telecommunications.

The Board shall complete this work and submit its recommendations and findings to the Governor and General Assembly on or before December one, nineteen hundred eighty-one.