JOINT LEGISLATIVE AUDIT AND REVIEW COMMISSION
OF THE VIRGINIA GENERAL ASSEMBLY

# The Impact of Digital TV on Public Broadcasting in Virginia

House Document No. 20

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# Preface

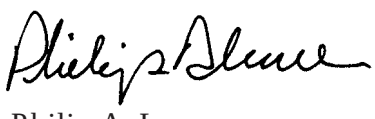
In December 1996, the Federal Communications Commission approved a new digital standard for television broadcasting, subsequently mandating that all television broadcasters convert from the current analog signal transmission to a digital signal. Public television broadcasters have until May 1, 2003 to meet this mandate. Item 16F of the 1999 Appropriation Act, directed the Joint Legislative Audit and Review Commission (JLARC) to study the implications of the federal requirement for digital transmission by the public television stations currently receiving funds from the State. Item 16F further directed JLARC to examine the use of existing State funding by these public television stations.

This study found that the transition to digital broadcasting by the Virginia public television stations will require significant investments on the part of the stations to replace the existing analog equipment with the digital components. All totaled, the stations estimate that it will cost $72 million dollars to convert to a digital signal. Additional funds above the $72 million estimate may be required for statewide interconnection and other costs associated with the transition.

While the transition costs are significant, the stations stand to lose their broadcast licenses if the conversion deadline is not met. Currently, the public television stations provide an array of services to school children, teachers, and the general citizenry of the Commonwealth. The stations are relying on the State to provide some portion of the digital conversion costs so that the stations can continue these services.

The decision to provide State funding for the digital conversion of public television is a policy choice left to the Governor and the General Assembly. This report provides information necessary to aid the discussion of this matter, and to guide the disbursement of State funds if the decision is made to provide funding. Specifically, JLARC staff recommend that several factors, representing (1) the equity of station resources available to fund the conversion, (2) the efficiency of service coverage, and (3) the degree of public service provided by the individual stations, be considered in allocating State funds for the conversion.

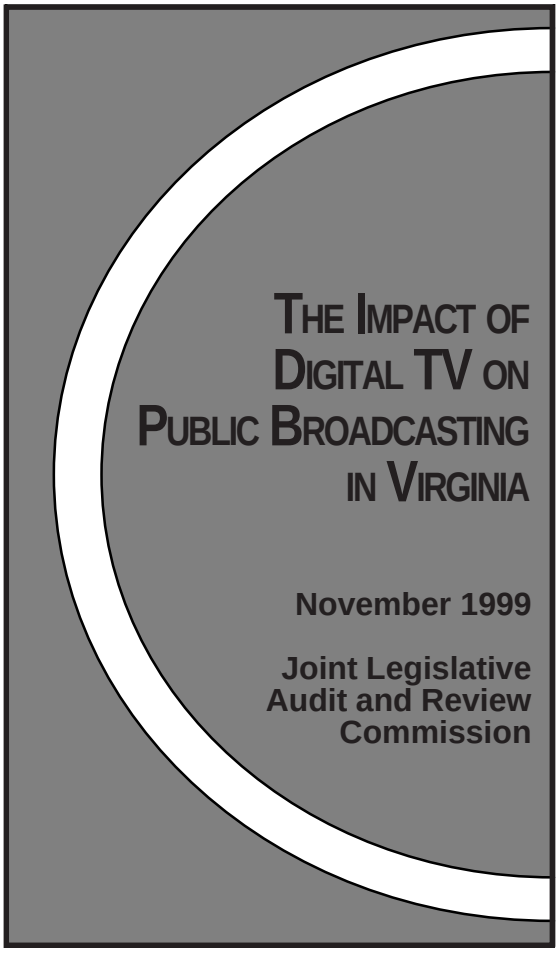
On behalf of the JLARC staff, I would like to express our appreciation for the assistance and cooperation provided by staff of Virginia's public television stations in the completion of this study.



Philip A. Leone
Director

November 23, 1999

# JLARC Report Summary




Television broadcasters across the country are required by the Federal Communications Commission (FCC) to convert from the current analog signal transmission to a new digital standard. There are currently 11 public television stations operated by four non-profit corporations in Virginia (see map, next page). These corporations are: Central Virginia Educational Telecommunications Corporation (CVETC), Hampton Roads Educational Telecommunications Association (HRETA), Blue Ridge Public Television Incorporated (BRPT), and Shenandoah Valley Educational Television Corporation (SVETC). In addition to the 11 stations licensed in Virginia, a relatively large audience of Northern Virginia residents receive public television from the Greater Washington Educational Telecommunications Association (WETA), licensed out of Washington, DC. According to the current FCC mandate, the 11 public television stations operated by these four entities, as well as WETA, must have the ability to broadcast a digital signal by May 1, 2003. If this deadline is not met, the stations will have to relinquish their television broadcast licenses and cease operation.

The new digital signal will provide multiple opportunities for public broadcasters to expand and enhance current educational and cultural programming. However, there are significant costs associated with the conversion. These costs are substantial because virtually all of the existing analog infrastructure will have to be replaced with digital equipment. All totaled, the Virginia public stations estimate that it will cost approximately $72 million to replicate today's public television system, while taking advantage of some of the additional capabilities available through the digital technology.

Because of the substantial cost of the digital conversion and the long-standing State financial support of programming and capital needs at the public stations, the 1999 General Assembly directed JLARC to examine the implications of the mandated digital conversion at the Virginia public stations. The study mandate further directed JLARC to examine the use of existing State funding at the Virginia public stations. Major conclusions of this study are:

- The State has recognized that public television serves the public interest of Virginia citizens, as evidenced through the appropriation of approxi-

# Public Television Stations in Virginia and Estimated Main Transmitter Coverage

**Public Television Corporations in Virginia and Stations Operated**

Central Virginia Educational Telecommunication Corporation:
- WCVE -- Richmond
- WCVW -- Richmond
- WHTJ -- Charlottesville
- WNVT -- Goldvein/Fredericksburg
- WNVC -- Falls Church

Hampton Roads Educational Telecommunications Association:
- WHRO -- Hampton/Norfolk

Blue Ridge Public Television, Inc.:
- WBRA -- Roanoke
- WMSY -- Marion
- WSBN -- Norton

Shenandoah Valley Eduation Television Corporation:
- WVPY -- Front Royal
- WVPT -- Harrisonburg/Staunton

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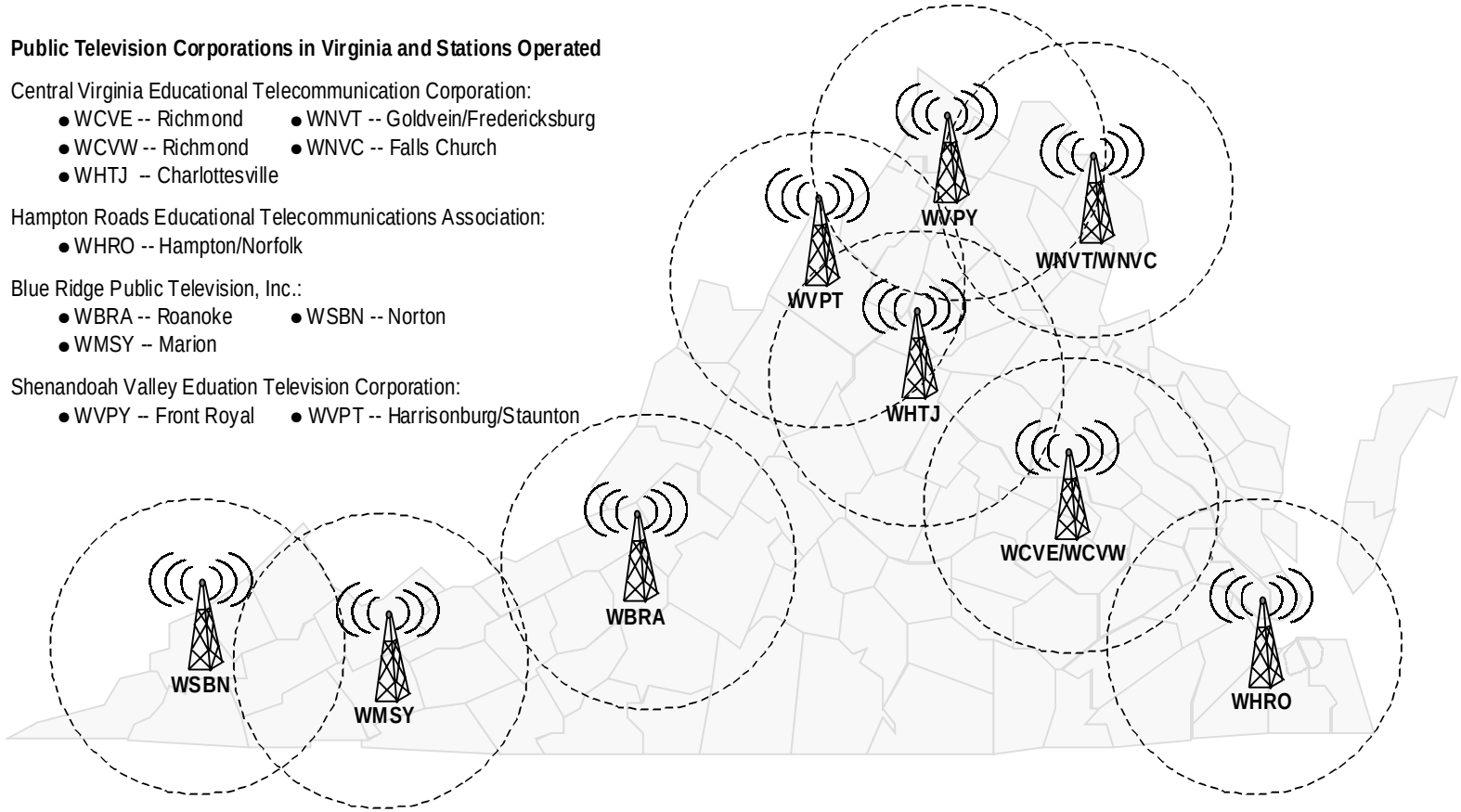



Note: This map depicts estimates of the main transmitter signal coverage for the 11 public television stations in Virginia. Coverage is enhanced by translator stations that receive and rebroadcast the signals (for example, the Southside areas that appear to have no coverage are served by multiple translator stations operated by WCVE in Richmond). Signal coverage both inside and outside the coverage areas depicted may be influenced by many factors, such as geography. Further receipt of public television programming outside the broadcast areas depicted is possible through signal acquisition and dispersion by cable. In addition, a large population of Northern Virginia residents receive public broadcasting from WETA, which is licensed in Washington, D.C., but has its studios, offices, and temporary digital transmitter located in Arlington.

Source: JLARC staff analysis of coverage estimates provided by the Public Television Corporations.

mately $132 million in General Funds over the last four decades.

- State funds are generally managed in a fiscally prudent manner by the public television stations.

- Digital technology presents a number of enhanced capabilities relative to the current analog system, but the conversion that must take place to take advantage of these capabilities and to meet the FCC mandate will be costly.

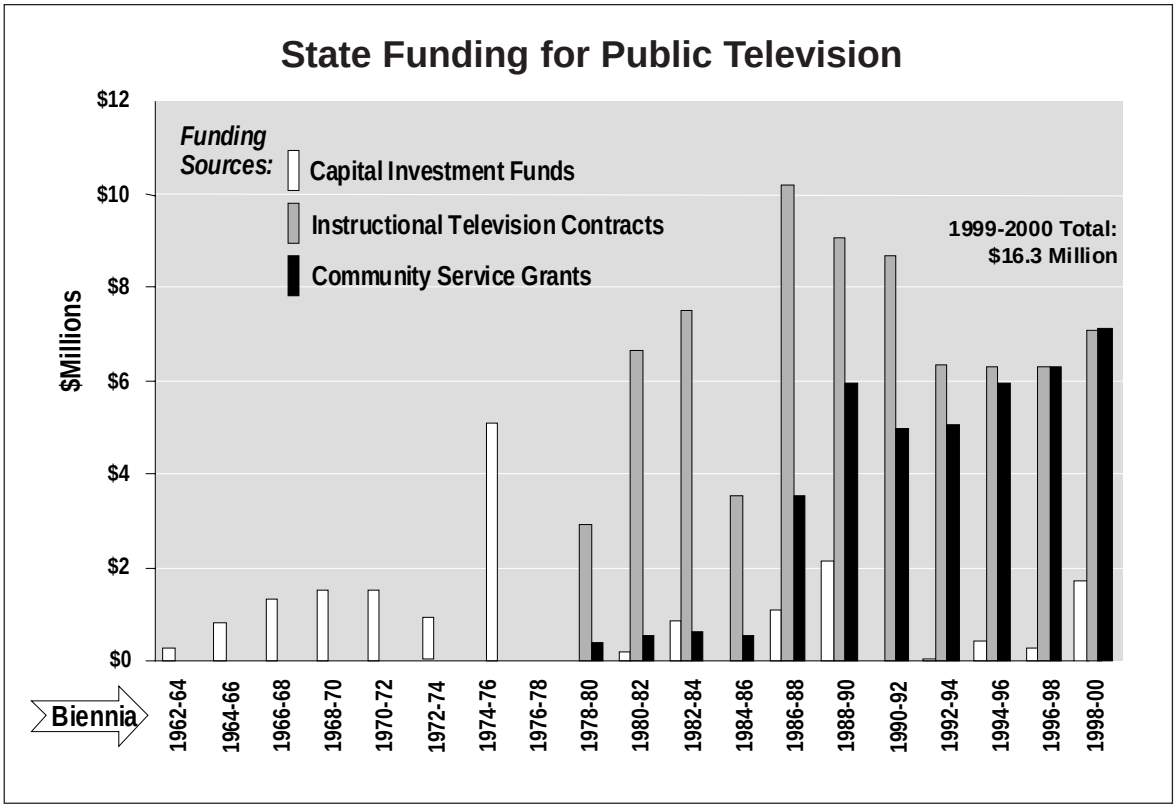
- If the State decides to provide financial support for the digital conversion at the public stations, the allocation of State funding should be based on equity of station resources, efficiency of service coverage, and the degree of public service to Virginia's citizens by the public stations.

This report contains ten recommendations to help guide the decisions made regarding current and future State funding of the conversion to digital technology by the public television stations.

## The State Has Recognized that Public Television Serves the Public Interest

Since the inception of public television in Virginia, the State has provided substantial monetary support for the broadcast facilities and equipment utilized by the four public television corporations. In addition, State funds have been provided to help acquire programming to address educational, cultural, and entertainment needs of Virginia citizens.

The chart below presents the history of State funding for public television by program. Currently, the State funds public television through three funding streams. These are:



(1) capital funding to help with equipment purchases and facility improvements;

(2) instructional television funding, which pays for the acquisition and broadcast delivery of educational programming by the public stations to the thousands of schools across the State; and,

(3) community service grants, used for general programming related to public affairs and other alternatives to commercial television programming.

Over the past four decades, the State has provided approximately $132 million in General Fund dollars to the public television stations. This funding began in FY 1963 and has continued at various levels through the current biennium.

## State Funds Are Generally Managed in a Fiscally Prudent Manner by the Public Television Stations

JLARC staff's examination of the management of State funds by the public stations indicated that these funds are generally managed prudently by the stations (see Financial Assessment Summary, below). The current financial health of the stations appeared to be good, with generally small levels of long-term debt and no loan defaults at the stations. The stations each employ a financial officer who tracks expenditures and reports financial conditions to management and corporate boards. Procurement procedures are in place, but the formalization of internal control procedures could be more complete. The public television corporations in Virginia should consider developing written documentation of internal control policies and procedures.

**Financial Assessment Summary of Virginia's Public Broadcasting Stations**

| Financial Criteria | Public Television Corporation | | | |
|---|---|---|---|---|
| | Blue Ridge | Central Virginia | Hampton Roads | Shenandoah Valley |
| Corporate Assets | ✔ | ✔ | ✔ | ✔ |
| Long-term Debt | ✔ | ✔ | ✔ | ✔ |
| Financial Planning | ❍ | ✔ | ❍ | ✔ |
| Expenditure Reporting | ✔ | ✔ | ✔ | ✔ |
| Procurement Practices | ✔ | ✔ | ✔ | ✔ |
| Written Internal Controls | ❍ | ❍ | ❍ | ❍ |
| Board Oversight | ✔ | ✔ | ✔ | ✔ |
| Asset and Investment Management | ✔ | ✔ | ✔ | ✔ |
| Annual Audits | ✔ | ✔ | ✔ | ✔ |

**Key:**

✔ = Complies with generally accepted accounting principles (GAAP)

❍ = Complies with GAAP, but weaknesses exist or improvements may be needed

✘ = Does not comply with generally accepted accounting principles (GAAP)

The stations' corporate boards appear to exercise appropriate fiduciary oversight, as well as sound asset and investment management. Despite the magnitude of State funds received, the stations are not subject to audit by the Auditor of Public Accounts. However, each public television corporation undergoes an annual independent audit, the most recent of which indicated that the financial statements were accurate and conducted in accordance with generally accepted accounting principles. JLARC staff found that one area of financial planning in need of improvement was that of setting aside funds for the depreciation of assets, which is not done by the majority of the public television corporations.

## The Cost to Convert the Public Stations Is Estimated at $72 Million

The public television stations are excited about the enhancements available from digital technology in its application to their primarily educational mission. Specifically, the stations are interested in the capability of simultaneously "multicasting" four or more programs, and supplementing this programming with non-traditional television content through "datacasting." Meeting the FCC mandate for the basic digital conversion, and acquiring the ability to multicast and datacast, will cost the stations approximately $48 million according to current estimates. In addition, it will cost approximately $24 million more to replicate today's public television including the ability for local program production. All totaled, the public television stations estimate a cost of $72 million to fully replicate today's system and take advantage of some of the enhancements available through digital technology. While the Virginia conversion will have a significant price tag, JLARC staff did not find these estimates to be out of line with conversion estimates from other states' public television systems. The table on the following page presents the total estimated costs of the digital conversion at each of the 11 public stations in Virginia.

In addition to converting the stations themselves, the stations must also convert the current statewide interconnection of the stations, used for program exchange and statewide distribution of teleconferences, programs, and distance learning, to a digitally compatible system. The options and associated costs of upgrading the statewide interconnection are in need of further clarification if State funding for this part of the conversion is sought. The Public Broadcasting Board should make this information available to the General Assembly.

## State Funding of Digital Conversion Should Consider Factors of Equity, Efficiency, and Public Service

The Virginia public stations are anticipating funding for the conversion from their three historical major funding sources of public broadcasting: individual and corporate donations, the federal government, and the State. The amount of funding that will be available from these three sources is unclear. Congress is currently considering two proposals that would provide from $450 to $750 million for the conversion nationwide, but the exact amount of funding to be provided has not yet been determined. In addition, the stations are in various stages of capital fundraising campaigns targeting audiences for contributions earmarked for the digital conversion and other financial needs. It is also anticipated that the stations, through the Virginia Public Broadcasting Board, will be requesting significant State funding (approximately $24 million in the upcoming biennium) for the conversion.

Other states have provided funds for the conversion of public television, and some have required that this assistance be matched by other funding sources. In addition, some states have required that public

## Estimated Cost of Digital Conversion for Virginia Public Television Stations

| Station | Conversion Cost |
|---|---|
| **Blue Ridge Public TV** | |
| WBRA – Roanoke | $9,796,976 |
| WMSY – Marion | 1,659,407 |
| WSBN – Norton | 1,991,907 |
| **Central Virginia Public TV** | |
| WCVE – Richmond | 9,297,914 |
| WCVW – Richmond | 3,454,114 |
| WHTJ – Charlottesville | 1,685,000 |
| WNVC – Falls Church | 9,556,051 |
| WNVT – Goldvein/Fredericksburg | 11,546,405 |
| **Hampton Roads Public TV** | |
| WHRO – Hampton/Norfolk | 9,277,493 |
| **Shenandoah Valley Public TV** | |
| WVPT – Harrisonburg/Staunton | 12,405,311 |
| WVPY – Front Royal | 1,068,728 |
| **Total** | **$71,739,306** |

Note: In addition to the 11 recognized Virginia stations, WETA has estimated its digital conversion costs to be $10.5 million, of which $2.5 million has already been incurred.

funds revert back to the state in the event that other funding sources (primarily federal funding) are made available at some later point. If State funds are provided for the conversion in Virginia, the General Assembly may want to consider the use of several factors to distribute the funds to the public television stations in furtherance of certain public policy goals.

While it is clear that each of the Virginia public television stations is facing considerable costs in the digital conversion, some stations are certainly in better financial positions to absorb some of those costs. This situation can be recognized in State funding of the digital conversion by factors that measure station assets in comparison to conversion costs and the stations' relative effort made to raise private funds for capital needs. In addition, it may not be prudent to utilize public funds to perpetuate inefficiencies in the public television signal coverage across the State. State funding can improve efficiency by funding the conversion for only a single transmitter in any existing areas of broadcast signal overlap or duplication. Finally, the value of public television to the citizens of Virginia, expressed through services provided to school children and the general population, provides a reasonable basis for disbursement of any State funding made available for the digital conversion.

JLARC staff considered these three criteria, separately and in combination, to illustrate how State funding could be disbursed should the General Assembly choose to assist the stations financially in the conversion. In addition, a funding option based on the proportion of the total statewide conversion cost was calculated, because it appears that the Public Broad-

casting Board will recommend such a funding approach. For illustrative purposes only, JLARC staff assumed a State funding level of one-third of the total estimated cost of the conversion system-wide for each of the five options. The table below presents the results of the illustrative funding options.

Given the importance of the three funding factors identified in this report, if State funds are made available for the conversion, the General Assembly may want to consider a combination of factors representing the criteria of equity, efficiency, and public service provision in the disbursement of funds. This would ensure that public funds are provided to the stations which need them the most, and that serve significant audiences efficiently with educational and other non-commercial programming. The General Assembly may also want to consider requiring State funds to be matched from other sources, and providing for the reversion of State funds to the extent that available federal funds exceed some proportion of the conversion costs.

## Summary of Resulting Funding from Options Examined by JLARC Staff (Based on an Assumed State Funding Level of One-Third the Total System-Wide Conversion Cost)

| Public Television Corporation | Option 1: Proportional to Total Cost | Option 2: Equity of Station Resources | Option 3: Efficiency of Service Coverage | Option 4: Degree of Public Service | Option 5: Combination of Options 2,3, and 4 |
|---|---|---|---|---|---|
| Blue Ridge Public Television, Inc. | $4,499,053 | $7,429,169 | $6,304,310 | $3,931,155 | $5,085,561 |
| Central Virginia Educational Telecommunications Corporation | 11,889,544 | 2,582,576 | 6,304,310 | 12,336,053 | 6,020,256 |
| Hampton Roads Educational Telecommunications Association | 3,103,736 | 6,868,999 | 2,101,437 | 5,769,232 | 4,020,284 |
| Shenandoah Valley Educational Television Corporation | 4,507,667 | 7,119,256 | 4,202,873 | 1,963,560 | 3,786,828 |
| **TOTAL** | **$24,000,000** | **$24,000,000** | **$18,912,929** | **$24,000,000** | **$18,912,929** |

Note: Total State funding in Options 3 and 5 represent an efficiency realized through the elimination of two Virginia stations and the associated conversion costs.

# Table of Contents

# I. Introduction

In December 1996, the Federal Communications Commission (FCC) approved a new digital standard for television broadcasting, subsequently mandating that all television broadcasters convert from the current analog signal transmission to a digital signal. Commercial television stations have until 2002 to begin broadcasting a digital signal, while public television stations have until 2003 to broadcast digitally. Like the conversion to color television in the 1950s, the change to digital transmissions will render much of the current equipment used in television broadcasting and production obsolete. Thus, this transition to digital broadcasting will require additional capital investments, as well as other production expenditures, on the part of broadcasters across the country. While the costs of this transition are significant, the technological capabilities of digital broadcasting will change television into a much more interactive and potentially more educational experience for viewers.

Item 16F of the 1999 Appropriation Act (Appendix A) directs JLARC to study the implications of the FCC's requirement that public stations begin digital transmission of television programs by 2003. Item 16F further directs JLARC to study the use of existing State funding at the Virginia public stations. This report presents an analysis of the impact of digital television in terms of the costs that will be incurred by the public stations and the services that the new technology will allow the stations to provide. Further, this report provides possible options for State support of the digital conversion if the General Assembly decides such support is warranted. In addition, results of the analysis of Virginia public television's management of State funds are presented.

The remainder of this chapter discusses the origins of public television and the national organizations which influence the system, the coverage of Virginia by the public stations, and the requirements for the digital broadcasting conversion. Further, the approach and organization of this study are outlined at the end of this chapter.

## THE ORIGINS OF PUBLIC TELEVISION AND THE KEY PARTICIPANTS NATIONALLY

While public television stations in Virginia are independently licensed and operated, they have close ties to each other, as well as to national organizations that serve these stations and their peers across the county. In order to fully understand both the origins of public television in Virginia and the current issues facing these stations, the origin of public television nationally and the key national participants that impact the Virginia stations must be examined.

## The Origins of Public Television

The impetus of public television was a perceived need to provide educational material through the pictures and sound of television. To serve that end, the Federal Communications Commission, in its first nationwide allocation of television channels in 1952, reserved some of the available channels to serve the "educational needs of the community." Following the channel allocation, Houston's KUHT-TV became the first noncommercial television station when it began broadcasting in 1953.

In 1962, the federal government began its long history of funding public television through passage of the *Educational Television Facilities Act*. This act started a station-building boom across the country through the creation of a $32 million, five-year program of federal matching grants to construct educational television facilities. This program evolved into the Public Telecommunications Facilities Program (PTFP) in the Department of Commerce, which has continued to be a source of federal funding for public television. In 1967, Congress passed the *Public Broadcasting Act*, subsequently forming the Corporation for Public Broadcasting in 1968. In 1969, the Corporation for Public Broadcasting formed the Public Broadcasting Service and regular national television program distribution began. During this time period, some of the most popular and longstanding public television programs debuted (*Mister Rogers' Neighborhood* in 1968 and *Sesame Street* in 1969, for example).

From this beginning, the four organizations mentioned above have continued to be the key entities nationally in relation to public television, with the Federal Communications Commission regulating, the Public Telecommunications Facility Program and the Corporation for Public Broadcasting providing federal funding, and the Public Broadcasting Service providing programming to public broadcasters.

## Federal Communications Commission

The Federal Communications Commission (FCC) is an independent agency of the federal government charged with regulating interstate and international communications, including broadcast television. Its jurisdiction includes the 50 states, the District of Columbia, and all U.S. possessions. The agency's origin can be traced back to 1934 with the passage of the *Communications Act* (47 U.S.C. 151 *et seq.*).

Within the FCC, the Mass Media Bureau administers the regulatory program for television, as well as other media. This Bureau is responsible for issuing construction permits and operating licenses, and renewals or transfers of such. Further, it is responsible for overseeing broadcaster compliance with statutes and Commission policies, including those related to digital transmission.

## Public Telecommunications Facility Program of the Department of Commerce

The Public Telecommunications Facility Program (PTFP) of the Department of Commerce evolved out of the initial program for federal funding of public television,

the *Educational Television Facilities Act.* PTFP provides grants to public broadcasters (both television and radio) to purchase equipment used for educational/instructional purposes, to expand coverage of public broadcasting into non-covered areas, and to fund general broadcast improvement/augmentation projects. Funds are awarded on a competitive basis, with the PTFP staff examining a number of factors in making funding decisions. Depending upon the type of project, matching funds may be required from the entity receiving the grant.

According to staff of PTFP, approximately $21 million was available for award in Federal Fiscal Year (FFY) 1999. Approximately $20 million was awarded in FFY 1998. Currently, PTFP is slated to distribute a major portion of the future federal funding that may be available to public television stations for the digital conversion.

## Corporation for Public Broadcasting

The Corporation for Public Broadcasting (CPB) is a private, nonprofit corporation that was created by Congress in 1967. While not considered a government agency, CPB is the largest single source of funding for public television (and public radio), and most of the CPB-funded television programs are distributed through the Public Broadcasting Service (discussed below). Congress appropriates funds to CPB, of which 95 percent must be used to directly benefit audiences through Community Service Grants to stations, programming grants to producers, or other station-related activities. For example, under CPB's FY 1997 budget, approximately $174 million of the $260 million appropriation went to support public television ($58 million went to support public radio, and $29 million to system support and administration). Of the $174 million allocated for public television, approximately $130 million went directly to public television stations across the country in the form of Community Service Grants. These grants can be used by stations primarily to offset costs associated with the production or the acquisition of programming.

## Public Broadcasting Service

The Public Broadcasting Service (PBS) is a private, nonprofit corporation founded in 1969 to serve its members with "programming and services of the highest quality and the imaginative use of technology to advance education, culture and citizenship." Its members consist of 171 licensed broadcasters who operate 350 stations across the 50 states and in U.S. territories. Member stations hold noncommercial, educational licenses granted by the FCC. Member broadcasters can be licensed as community organizations, colleges and universities, state authorities, or local authorities. In Virginia, all member stations hold community licenses, although each of the Virginia licensees is uniquely organized in terms of its relationship to the local community it serves.

PBS is funded by member stations, the Corporation for Public Broadcasting, and a few other sources. PBS member stations pay dues, as well as fees for acquiring PBS programming. In fact, the major role of PBS for local public television stations is

in program production, acquisition, promotion, and distribution. In FY 1997, the PBS National Program Service was responsible for distributing 2,189 hours of original-broadcast programs to member stations for a wide array of audiences.

## THE STATE'S INVOLVEMENT IN THE DEVELOPMENT OF PUBLIC TELEVISION AND THE CURRENT SYSTEM IN VIRGINIA

Like public television nationally, the origin of Virginia's public television stations was based on the perceived need to support local schoolteachers and students with additional educational resources. The medium of television was seen as a desirable means to this end due to its growing popularity and its ability to reach over large distances with both picture and sound. Because of this "public interest," the State has played an integral part in the development of public stations in the Commonwealth, as well as in the continued financial support of these stations (discussed in the next chapter of this report).

### The State's Involvement in the Evolution of Public Television in Virginia

The origin of today's public broadcasting can be traced to 1952, when the Federal Communications Commission (FCC) set aside a number of television channels and radio frequencies to serve the "educational needs of the community." In 1959, the Virginia General Assembly passed House Joint Resolution 17, creating a commission to study the feasibility of educational television. Subsequently, the 1962 General Assembly enacted the *Educational Television Stations Facilities Construction Act*, which created the Advisory Council on Educational Television. The Council was charged with conducting engineering and other studies pertinent to the use of television for educational purposes, and assisting localities in the construction and operation of broadcasting facilities. The Council's educational television plan envisioned an open circuit broadcast system, and over time, petitions for channels were filed by locally based not-for-profit corporations and granted by the FCC.

The next major State legislation pertaining to public television was passed by the 1972 General Assembly and was simply to amend and reenact the *Educational Television Stations Facilities Construction Act*. This legislation renamed the act the *Public Telecommunications Act*, and dissolved the Advisory Council on Educational Television. In its place, the Virginia Public Telecommunications Council assumed the Advisory Council's old duties with some slight modifications. In 1978, the Virginia Public Telecommunications Council was placed under the office of the Governor as a separate State agency.

At the same time, a Telecommunications Study Commission was established to:

- evaluate the uses and effectiveness of public telecommunications services in the Commonwealth;

- 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;

- make recommendations as to the most cost-effective use of public telecommunications in the Commonwealth;

- 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

- 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 telecommunication facilities, services, or programs in the Commonwealth.

The study commission recommended, among other things, a new board to replace the Telecommunications Council, with a new agency serving as staff to the board. This recommendation was codified by the 1980 General Assembly with the creation of the Department of Telecommunications and the Virginia Public Telecommunications Board within this department. The Department was placed under the Secretary of Administration and Finance. In 1984, this Secretariat was split, and the Department was merged with several other agencies to create the Department of Information Technology (DIT) within the new Secretariat of Administration.

The organization remained unchanged until 1997 when the Virginia Public Telecommunications Board was dissolved and the Virginia Public Broadcasting Board was created in its place. However, the board was no longer considered part of DIT. Instead, the board was placed directly under the Secretary of Administration, where it resides today. The 1999 General Assembly completed this break from DIT by placing funding for public television as separate items directly under the budget for the Secretary of Administration (previously, the funding had remained as items under DIT's appropriation).

## The Current System of Public Television in Virginia

There are currently four non-profit, community-based corporations that receive State funding for television broadcasting. These four corporations are part of the national PBS system; they therefore receive some funding from the federal government through the Corporation for Public Broadcasting and are eligible to apply for funding from the Public Telecommunications Facilities Program. These four corporations are: the Central Virginia Educational Telecommunications Corporation; the Hampton Roads Educational Telecommunications Association; Blue Ridge Public Television, Incorporated; and the Shenandoah Valley Educational Television Corporation. These four corporations hold broadcast licenses in the Commonwealth of Virginia as granted

by the FCC. Together, these corporations operate a total of 11 public television stations. Figure 1 presents the approximate coverage areas of the main transmitters at each of the stations operated by these four public television corporations. Further coverage (not depicted in Figure 1) is provided through translator stations that acquire the signal and rebroadcast it to different regions.

In addition to the main transmitters and translators operated by the 11 stations, these four corporations maintain portions of a statewide interconnection system, referred to as the microwave network. This network is composed of a series of towers equipped with line of sight microwave receivers and transmitters. These towers in and of themselves do not broadcast a signal that can be picked up by the average citizen; rather they relay the stations' signals via microwaves to each other (and to other entities as well). For example, if WBRA in Roanoke is interested in airing a program originating in Richmond, WCVE will transmit that signal through a series of microwave links to WBRA's main transmitter outside of Roanoke. From there, WBRA will broadcast the signal in the same way that it would have had the program originated in Roanoke. In this way, programs originating at any of the 11 stations across the Commonwealth can be broadcast throughout the State (the statewide broadcast of the Governor's State of the Commonwealth Address by public television is an example of the current use of this microwave network).

Also, as depicted in Figure 1, broadcast signals are not confined to political sub-divisions or other artificial borders, and it should therefore be noted that Virginia citizens receive public television signals from other entities licensed outside of the Commonwealth. In particular, the Greater Washington Educational Telecommunications Association (WETA) provides public television broadcasts to a large number of Virginia citizens in the Northern Virginia area (WETA estimates that its signal reaches approximately 270,000 Virginia households each week). Further, there is even some overlap among the public stations licensed in Virginia (for example, two stations broadcast in the Charlottesville area). Similarly, Virginia public broadcasts reach into parts of West Virginia, Tennessee, Kentucky, North Carolina, and Maryland. This topic is examined in greater detail in Chapter IV of this report.

## THE FCC MANDATE FOR DIGITAL TELEVISION

The Federal Communications Commission (FCC) has mandated that all television broadcasters across the county, both commercial and public, convert their broadcast signal from the current analog to digital. The digital signal comprises a stream of binary code, like that used by a computer, that can more efficiently deliver traditional content, while providing capacity for non-traditional television content as well (these possible enhancements related to the digital technology are discussed in Chapter III). Each station must meet this mandate or relinquish its broadcast license to the FCC.

In order to meet the FCC mandate, at a minimum, stations must be able to acquire digital programming (be it from their own production or from an outside source)

**Figure 1**

# Public Television Stations in Virginia and Estimated Main Transmitter Coverage

**Public Television Corporations in Virginia and Stations Operated**

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Hampton Roads Educational Telecommunications Association:
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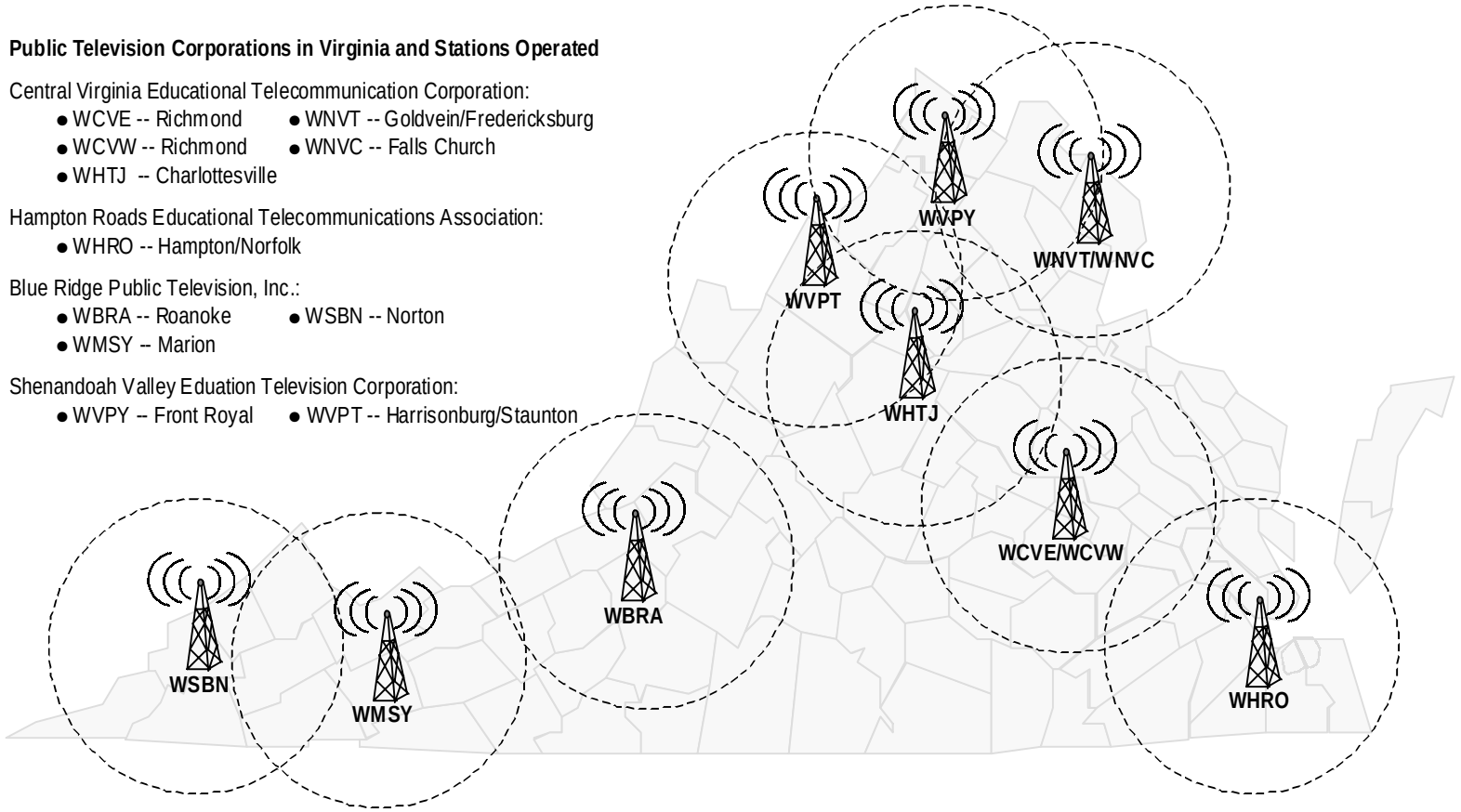
- WVPY -- Front Royal
- WVPT -- Harrisonburg/Staunton




Note: This map depicts estimates of the main transmitter signal coverage for the 11 public television stations in Virginia. Coverage is enhanced by translator stations that receive and rebroadcast the signals (for example, the Southside areas that appear to have no coverage are served by multiple translator stations operated by WCVE in Richmond). Signal coverage both inside and outside the coverage areas depicted may be influenced by many factors, such as geography. Further receipt of public television programming outside the broadcast areas depicted is possible through signal acquisition and dispersion by cable. In addition, a large population of Northern Virginia residents receive public broadcasting from WETA, which is licensed in Washington, D.C., but has its studios, offices, and temporary digital transmitter located in Arlington.

Source: JLARC staff analysis of coverage estimates provided by the Public Television Corporations.

and broadcast it to a coverage area roughly the same as their current main transmitter broadcast area. Meeting this mandate will require the overhaul of existing broadcast facilities, as the current analog equipment is incompatible with the equipment needed for digital broadcasting. The FCC mandate does not address the stations' ability to fully replicate their current operations (for example, local production) which will require additional equipment replacement if the stations desire to do more than "pass through" a digital signal. The conversion process will likely be costly and complicated.

Local stations are allowed to begin digital TV (DTV) service as soon as they receive their DTV permit, although the FCC has mandated deadlines by which they must do so. These deadlines are determined by the commercial/non-commercial nature of the station, network affiliation, and size of the broadcast market. Stations that fail to convert will lose their channel allocation. A timeline of important dates in the DTV conversion follows:

- May 1, 1999: Those commercial stations affiliated with ABC, CBS, FOX, and NBC in the 10 largest markets were required to begin broadcasting digitally.

- November 1, 1999: Stations affiliated with ABC, CBS, FOX, and NBC in markets 11-30 were required to begin broadcasting digitally.

- May 1, 2002: All remaining commercial stations must begin digital broadcasts.

- May 1, 2003: Noncommercial educational stations must begin digital broadcasts.

- 2003-2006: Transition period during which stations must broadcast in both digital and analog formats.

- 2006: Planned termination of analog broadcasts.

To assist in the conversion, the FCC has awarded an additional – but temporary – channel to each local station for its digital broadcasts. Stations will be expected to broadcast both analog and digital signals until 2006, as indicated above. At that time, if 85 percent of broadcast households can receive a digital signal through a digital television set, a converter box, or cable-like service, stations will cease analog broadcasts. Stations will then return their analog channel to the FCC, which will auction off some of the reclaimed broadcast spectrum to other entities.

According to this schedule, Virginia's public television stations must begin digital broadcasts by May 1, 2003. Currently, no Virginia public station is broadcasting in DTV, although residents in Northern Virginia can receive DTV signals from WETA's digital transmitter currently located in Arlington.

## JLARC REVIEW

Item 16F of the 1999 Appropriation Act mandated a study of the implications of the FCC mandated conversion to digital signals on the public television stations of Virginia. This item further required an examination of the use of existing State funding at the recognized Virginia public television stations. This section provides an overview of the study issues and research activities used in this study.

### Study Issues

In order to meet the requirements of the study mandate, JLARC staff identified several issues for examination. These include:

- What are the stations' estimated capital costs of meeting the FCC mandate for digital broadcasting, and are these reasonable estimates?
- What are the possible options and estimated costs of converting the statewide microwave network for digital broadcasts, and are these reasonable estimates?
- What additional costs, beyond those incurred in meeting the FCC mandate for transmission of a digital signal, will the Virginia stations realize under the digital conversion?
- What non-state funding is or may be available for the conversion to digital broadcasts?
- What mechanisms and procedures are in place at the public television stations to ensure that current State funds are being expended in a fiscally prudent manner?
- If the General Assembly determines that it is in the public interest to provide financial support for the conversion to digital, what factors and funding options should guide this support?

### Research Activities

Research activities for this study were primarily structured interviews and review of secondary data. This research was completed between February and July, 1999.

***Structured Interviews.*** Interviews were conducted with staff from each of the Virginia public stations, as well as with staff from the Greater Washington Educa-

tional Telecommunications Association. Additionally, interviews were conducted with staff of the Virginia Association of Public Television Stations and the Public Broadcasting Board. JLARC staff also met with staff from the Public Broadcasting Service, the Corporation for Public Broadcasting, and the Public Telecommunications Facilities Program of the U. S. Department of Commerce. Telephone interviews were conducted with various other states, stations, and relevant organizations.

***Review of Secondary Data.*** JLARC staff reviewed a wide range of data supplied by the Virginia stations, including annual audits, digital transition plans, and estimated transition costs. Additional digital transition cost information produced by Horowitz Television Technology, the consultant hired by the Virginia Association of Public Television Stations on behalf of the Virginia stations, was reviewed as well. Digital plans and costs from other states and stations were solicited and subsequently reviewed by JLARC staff. General literature obtained from the Public Broadcasting Service, the Corporation for Public Broadcasting, and the Public Telecommunications Facilities Program, as well as from a wide range of other organizations involved in the television industry were reviewed for background purposes.

***Development of Illustrative Funding Options.*** One important implication of the FCC mandate, should the General Assembly decide to pay a portion of the costs for the digital conversion, is that the State may need to develop an approach to efficiently and equitably apportion such funding to the public stations. JLARC staff examined several factors which could be used to distribute State funds to the stations, and developed several options to illustrate how various factors, and combinations of factors, affect the funding provided to the stations. For each of the illustrative options, JLARC staff assumed a constant State funding level of one-third of the total cost of conversion. However, no actual recommendation of the amount that could be funded by the State is made.

The costs used in the illustrative options include the costs for the 11 stations licensed in Virginia. The options do not include funding for the Greater Washington Educational Television Association (WETA) for several reasons. First, while WETA broadcasts are available in Northern Virginia, WETA is not licensed as a Virginia public television station (WETA is licensed in Washington, DC). Second, with its main transmitter located in Maryland, WETA has been ineligible for inclusion in any of the current State funding programs for public television, and therefore, has not historically participated in capital funding from the State. Finally, WETA was not included in this analysis because it does not participate in the instructional television program for public schools in Virginia. Should the General Assembly decide that it wishes to include WETA in funding for the digital television conversion, the illustrative options in this report can be revised to account for WETA conversion costs and allocation factors (discussed in detail in Chapter IV).

## REPORT ORGANIZATION

This report is organized into four chapters, including this introduction. Chapter II presents information on the historical State financial support of public television and the management of State funds at the public stations. Chapter III presents the planned usage of the digital technology by the Virginia public stations and the current estimated costs of the conversion at the stations. Finally, Chapter IV presents information on possible funding sources for the digital conversion and presents options for additional State funding should the General Assembly decide additional State funding is warranted.

# II. State Funding for Public Television and Management of State Funds

The public television stations in Virginia serve the State's public interest in a variety of ways. This public service has been recognized over time by the General Assembly and Executive Branch through significant State funding to support programs aimed at audiences potentially overlooked by commercial television. Over the past four decades, the State has provided $132 million to support public television facilities and programming. While the level of State support of public television is significant, the State has little information available as to the management of those State funds, as the public television corporations are not subject to audit by the Auditor of Public Accounts.

This chapter presents the results of JLARC staff analysis of State funding for public television and the management of State funds by the corporations receiving the funding. The results of this analysis indicate that significant State funds have been provided to meet a variety of public interest needs of the Commonwealth and that these funds are generally managed in a fiscally prudent manner by the public television corporations. Some improvements in fiscal management could be made in terms of formalizing procurement procedures and in annual funding of depreciated assets by the public stations.

## HISTORICAL STATE SUPPORT OF PUBLIC TELEVISION AND THE POTENTIAL BENEFIT TO VIRGINIA'S CITIZENS

The Commonwealth of Virginia has historically recognized that public broadcasting serves the public interest in many ways. Public television stations, with the help of State financial support, have provided educational programs to school children in each of the 136 local school divisions in the State, and have provided the general public with program content designed as alternatives to commercial television. Multiple references within statutory language acknowledge that public broadcasting has served the public interest of the citizens of Virginia.

On the basis of this public interest, the State has financially supported both capital investments on the part of public television stations and production expenses related to programs designed to support public education, public affairs, and other cultural and economic development interests of the Commonwealth for the past four decades. Examination of State funding for public television reveals three major funding streams, all of which originate out of the State General Fund: funds for capital improvements, instructional television contracts, and community service grants.

Since public television first received State funding in FY 1963, the State has appropriated more than $132 million in nominal dollars. For the 1998-2000 biennium,

approximately $16.3 million was appropriated to the public television stations through these three streams. Figure 2 presents the historical State funding for public television across these funding streams, followed by a discussion of what each of the funding sources provide for the stations and for the citizens of the State. It should be noted that the figure contains a graph of funding adjusted back to constant 1962/64 dollars to account for inflation (using the Consumer Price Index). While this is not presented to diminish the magnitude of the investment on the part of the State, it is presented to illustrate that while appropriations have increased nominally over the years, the value of those funds in terms of their purchasing power has remained somewhat constant.

## The State Has Historically Provided Funding for Capital Improvements

With the passage of the *Educational Television Stations Facilities Construction Act* in 1962, the Commonwealth established a matching fund to financially assist localities in the development of educational television facilities. Originally, the fund was used to match one-third of the capital construction costs borne by the fledgling stations. This match rate was increased to one-half in 1964, and currently any State funds appropriated for capital investments at the public television stations must be matched at an amount at least equal to the State appropriation. The fund was started with an appropriation of $250,000 for the 1962-64 biennium, and the consistent appropriations (at various levels-see Figure 2) into this fund by the General Assembly continued through the 1974-76 biennium. Subsequent to the 1974-76 biennium, the General Assembly has appropriated funds for capital improvements on what appears to be a case-by-case basis, but has continued to invest significant funds into public television's infrastructure.

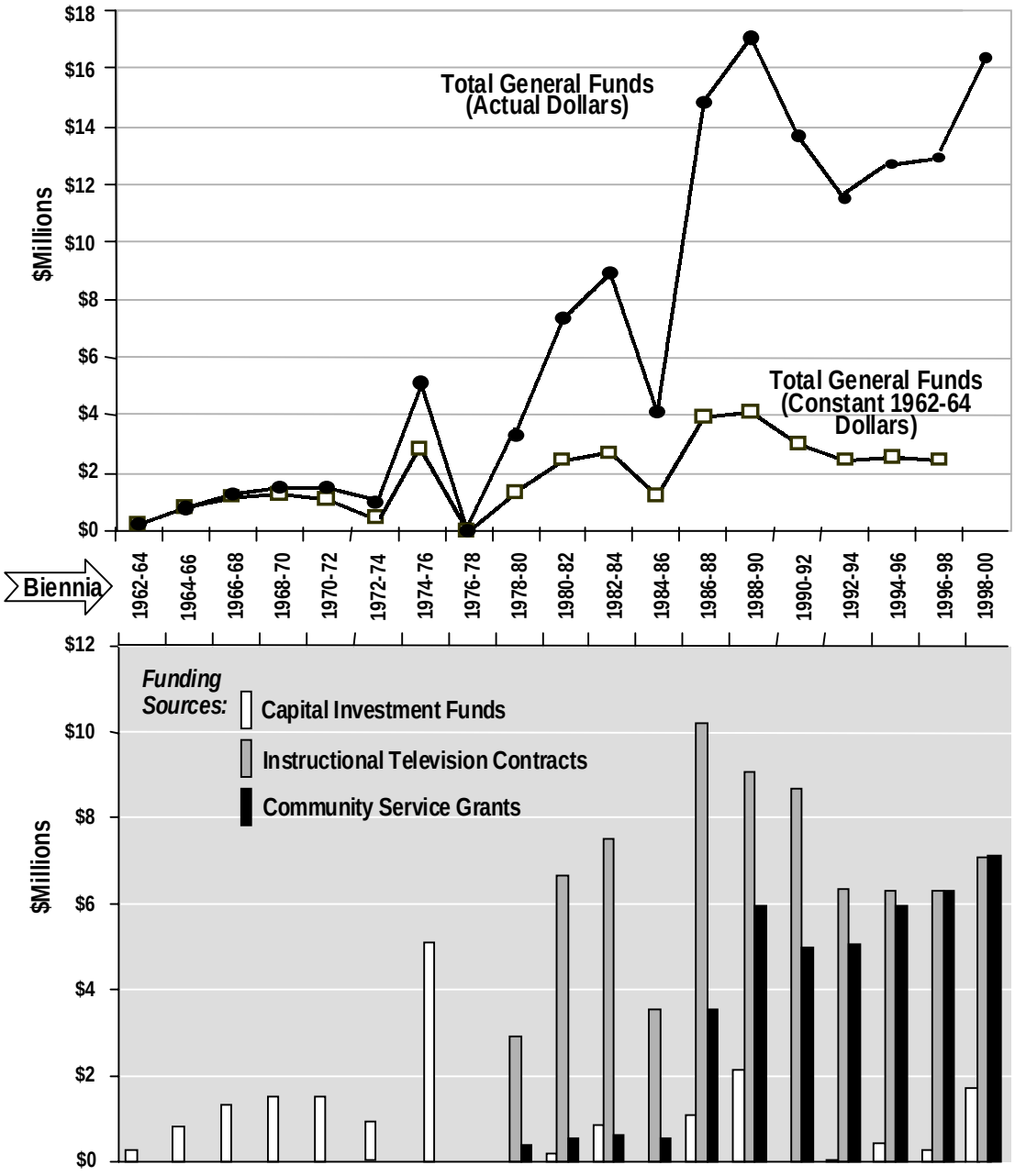
Currently, as appropriated in the 1999 budget, the Commonwealth is providing capital improvement funds to each of the four public television corporations. These funds of approximately $1.7 million have been and will be used by the stations for facility and equipment improvements which are in part related to the stations' transition to digital broadcasting. For example, WVPT in Harrisonburg has utilized some of the money to purchase digital-ready studio cameras. WBRA in Roanoke has purchased ten digital tape machines. The Central Virginia Educational Telecommunications Corporation had planned to utilize their appropriation (approximately $460,000) to help move one of its stations, WNVT, to a digital facility on the Stafford campus of Mary Washington College. It appears, however, that this plan will not come to fruition, and the appropriation will be returned to the General Fund.

## Funding for Instructional Television Provides Significant Potential Benefits to the Commonwealth's Schoolchildren

When the Virginia Public Telecommunications Council became a separate State agency in 1978, the General Assembly created a new funding stream to pay for the

**Figure 2**

## State Funding for Public Television




Note: The line representing constant 1962-64 dollars was derived through use of the Consumer Price Index, maintained by the U.S. Bureau of Labor Statistics.

Source: JLARC staff analysis of Virginia Appropriation Acts from the 1962-64 Biennium through the 1998-2000 Biennium.

provision of educational programming from the public television stations to Virginia's public elementary and secondary schools. This program is currently referred to as Instructional Television, or ITV. ITV programming is curriculum-based programming designed for use in the classroom by students and teachers. This program is paid for entirely by State funds, with local expenditures relating only to the equipment necessary to receive and view the material.

In practice, the public television stations each serve what is called a Regional Schools Contracting and Planning Committee (RSCPC). The RSCPC is made up of a representative from each of the school divisions found within a public station's coverage area, plus a Department of Education representative, and a representative from the public station itself. Currently, there are five RSCPCs, corresponding to WHRO in Norfolk, WCVE in Richmond, WNVT in Northern Virginia, WBRA in Roanoke, and WVPT in Harrisonburg. The RSCPC in each of the five areas meets and decides what needs the ITV programming will meet in those school divisions. Each RSCPC then submits its programming request to the public stations, and the Department of Education negotiates and approves a contract on behalf of each RSCPC with the corresponding station. The majority of ITV programming is obtained for use by all five stations through a group purchase that reduces individual station program acquisition costs. In addition to the group purchase, individual stations purchase programming under the ITV contract that their RSCPC determines is needed.

The vast majority of ITV programming is acquired, not produced by the Virginia public stations themselves. However, each station participating in the program goes through a process, along with the RSCPC, to relate the programming directly to identified needs of the schools they serve. The primary example of this process is the correlation of ITV programming to the State's Standards of Learning (SOLs). As new programming is identified for possible purchase through the ITV program, each station's ITV staff preview shows relating to a subject area (for example, WHRO staff preview shows relating to the Social Studies curriculum), and correlate the shows to that subject area's SOLs. Teachers then review the shows and evaluate their content relative to the subject areas and the identified SOLs prior to the ITV purchase.

It is the local programming design that separates ITV from educational programming available through other venues (for example, cable channels and general PBS programming). Whereas this general educational programming may meet a particular need of a teacher and class on a particular day, the teacher has no control over what is aired and when. ITV programming is designed by representatives from each school division to meet the multiple needs enumerated at the RSCPC meetings. Through this process, every program aired meets some identified need of the school divisions.

Funding for ITV began in the 1978-80 biennium (with $2.9 million) and has continued since. Over the years, the two-year appropriations have been as high as $10.1 million (in the 1986-88 biennium). For the 1998-2000 biennium, nearly $7.3 million was appropriated (see Figure 2). There is currently little information on how teachers use ITV programming and the extent to which it is used; still, the program represents a significant and potentially beneficial service available to Virginia's chil-

dren through the public television stations. In the 1998-99 school year, the five stations that provide ITV programming devoted more than 4,500 cumulative hours of broadcast time to the schools they serve (again, many of these hours are for the same programming at each station purchased through the group purchase). According to 1998 Fall enrollment figures from the Department of Education, ITV was available to approximately 1.1 million students in kindergarten through 12th grade.

### Community Service Grants Provide Potential Benefits to the General Citizenry Through the Public Stations

When the Virginia Public Telecommunications Council became a State agency in 1978, the State began providing funds for program acquisition and development. Since the 1988-90 biennium, this funding stream has generally been referred to as the Community Service Grant (CSG) program (apparently to match terminology used by the Corporation for Public Television in distributing federal funding). According to Appropriation Act language, the purpose of this funding has been to provide State assistance for programs that "support pre-school and adult education, disseminate information on governmental and public affairs, promote tourism and economic development within the Commonwealth, and inform, educate, and entertain families with program content which offers alternatives to commercialized television programming." For example, the broadcasts of the Governor's State of the Commonwealth Address (produced by WNVT) and the multi-program series *Virginia Legislative Review* (produced by WBRA) are funded from this source and transmitted throughout the State. CSG funds have helped to provide a wide array of programs to public television viewers of each of the Virginia stations. (Appendix B provides a list of programs and services funded in part by the State CSG appropriation in calendar year 1998.)

At the inception of CSG funding during the 1978-80 biennium, the Virginia Public Telecommunications Council was responsible for administering the funds to the Virginia public television stations. Currently, the Council's successor, the Virginia Public Broadcasting Board, administers these funds according to a set formula (incorporating a base amount per geographic region, and varying amounts based on the number of stations, the number of transmitters, and the stations' ability to raise non-State income). Stations that are eligible to receive federal CSG grants are eligible for State CSG funds provided that their offices, studios, and transmitters are located in the Commonwealth. Appropriations for the CSG program were approximately $395,000 in the 1978-80 biennium, and have grown over time to approximately $7.3 million for the 1998-2000 biennium (Figure 2, page 3).

## MANAGEMENT OF STATE FUNDS BY THE PUBLIC TELEVISION CORPORATIONS

As indicated, the public television corporations currently receive considerable financial support from the State. State funding comes in the form of funds for capital

projects and improvements, instructional television contracts, and community service grants. Although public television corporations have historically received State funds, they are not subject to audit by the Auditor of Public Accounts. However, public television corporations annually submit a report to the Department of Education that details expenditures related to instructional television. Yet, the General Assembly has no direct method by which to ensure that State funds provided to these corporations are managed in a fiscally sound manner. In FY 1998, State funding comprised between 20 and 38 percent of the corporations' annual revenue. Therefore, a large portion of operations are funded through State dollars. Given the potential magnitude of the additional State funds that could be provided to corporations for the digital conversion, the State has an even greater interest in ensuring that the public television corporations are responsible stewards of public funds.

Overall, the corporations appear to be financially viable entities with considerable assets and relatively little long-term debt. The corporations have maintained their financial well-being by employing sound financial management policies and procedures. In addition, the corporate boards, to whom the corporations must report, provide guidance to the corporations relating to investment and asset management. The corporate boards also oversee cash management. In accordance with generally accepted accounting principles, the public television corporations annually undergo an audit of their financial statements performed by an independent certified public accountant. A summary of the overall status of financial management by the Virginia public television corporations is shown in Exhibit 1.

The new equipment that will likely be purchased to meet the digital conversion deadline will require the dedication of significant resources. As a result, enhanced controls will be required for the capitalization and depreciation of fixed assets. While the financial position at each public television corporation currently appears to be good, the challenge of conversion to digital will necessitate continued close scrutiny of corporate revenues, expenditures, and assets.

## Financial Health of the Corporations Appears to Be Good

Most of the public television corporations fund operations in large part through investment income. Historically, the corporations have been able to at least break even using this approach. In some cases, the presence of a strong market has generated higher than expected returns. However, with the increased costs associated with conversion to a digital signal, corporations may be required to use principal assets to fund the increased expenditures. Notwithstanding the challenges that corporations may face with respect to the digital conversion, the current financial health of the stations appears to be good. With very little outstanding long-term debt, the corporations appear to be poised to meet the challenges before them.

***Corporate Assets.*** The presidents as well as the financial officers of Virginia's four public broadcasting corporations/associations characterize the financial health of their organizations as good. Although two of the corporations operated at a loss for the year ended June 30, 1998, net assets exceed $5 million for each organization. Net

**Exhibit 1**

## Financial Assessment Summary of Virginia's Public Broadcasting Stations

| Financial Criteria | Public Television Corporation | | | |
|---|---|---|---|---|
| | Blue Ridge | Central Virginia | Hampton Roads | Shenandoah Valley |
| Corporate Assets | ✔ | ✔ | ✔ | ✔ |
| Long-term Debt | ✔ | ✔ | ✔ | ✔ |
| Financial Planning | ❍ | ✔ | ❍ | ✔ |
| Expenditure Reporting | ✔ | ✔ | ✔ | ✔ |
| Procurement Practices | ✔ | ✔ | ✔ | ✔ |
| Written Internal Controls | ❍ | ❍ | ❍ | ❍ |
| Board Oversight | ✔ | ✔ | ✔ | ✔ |
| Asset and Investment Management | ✔ | ✔ | ✔ | ✔ |
| Annual Audits | ✔ | ✔ | ✔ | ✔ |

**Key:**

✔ = Complies with generally accepted accounting principles (GAAP)

❍ = Complies with GAAP, but weaknesses exist or improvements may be needed

✘ = Does not comply with generally accepted accounting principles (GAAP)

Source: JLARC staff review of financial statements, budgets, and interviews with key financial personnel.

assets include current assets (such as cash and cash equivalents) as well as non-current assets (such as land, equipment, and investments). Table 1 details the net assets for each corporation for FY 1998. Two of the corporations have no long-term debt and the other two have debt well within acceptable levels.

***Long-term Debt***. None of the stations have ever defaulted on a loan. Most of the stations have taken a conservative "pay as you go" approach to financial management. As a result, two of the corporations, Blue Ridge Public Television and the Shenandoah Educational Telecommunications Corporation, have no outstanding long-term debt. In 1994, the Central Virginia Educational Telecommunications Corporation entered into a transaction with the Industrial Development Authority (IDA) of Chesterfield County, Virginia in which the IDA issued bonds in the amount of $1,500,000. Principal payments are $150,000 annually through final maturity on May 31, 2004. As of June 30, 1998, the Central Virginia Educational Telecommunications Corporation had approximately $750,000 of debt outstanding. As of June 30, 1998, Hampton Roads Educational Telecommunications Association had approximately $1.3 million in outstanding debt. A portion of this debt resulted from costs associated with construction of the existing station facility. The remainder of the debt resulted from the association's use of lease/purchase agreements for the acquisition of equipment and capital assets. Overall, the long-term debt of all of the corporations is fairly minimal and comprises a relatively small portion of their net assets.

**Table 1**

## Virginia Public Television Corporations Net Assets FY 1998

| Corporation | Net Assets |
|---|---|
| Blue Ridge Public Television, Inc. | $5,253,109 |
| Central Virginia Educational Telecommunications Corporation | $34,664,530 |
| Hampton Roads Educational Telecommunications Association, Inc. | $5,245,423 |
| Shenandoah Valley Educational Television Corporation | $6,122,129 |
| **Total Assets** | **$51,285,191** |

Notes: For Central Virginia and Hampton Roads, the net value includes assets associated with public radio.
Source: JLARC review of the public television corporations' financial statements.

### Financial Management Practices Currently in Place Appear Adequate

As nonprofit entities, the public television corporations are obligated to follow generally accepted accounting policies and procedures. Therefore, the corporations must develop detailed budgets and plan for expenditures. Similarly, strategic planning is necessary to ensure that project goals are met and that sufficient resources are dedicated and expenses appropriately allocated. In addition, revenues and expenditures must be tracked and this information reported annually on financial statements. Finally, consistent procurement policies and procedures must be employed to ensure that resources are managed and that funds are not expended without proper authorization.

***Financial Management and Planning.*** The public broadcasting corporations in Virginia employ generally accepted practices to ensure fiscal responsibility and sound financial management. For example, each corporation has a dedicated financial officer within the organization, the presence of which helps to ensure that financial and procurement policies and procedures are in place and followed consistently. JLARC staff found that all of the corporations have developed planning documents for operational and capital initiatives either in-house or in conjunction with a consultant. In addition to strategic plans, the corporations have well-developed mission statements and long-term goals. The presence of such documents indicates forward thinking to allocate resources effectively or to identify necessary funding in time for the anticipated project start date.

***Expenditure Tracking and Financial Reporting***. All of the corporations develop budgets for operating expenses, capital expenses, and revenue. This process enables financial managers to monitor actual totals versus budgeted figures and iden-

tify any potential problems. To track revenues and expenditures and generate comparisons to budgeted figures, all of the corporations use some type of financial and/or accounting software. Use of such software also allows the public broadcasting corporations to report, as required, expenses by functional classification. It also assists financial managers in compiling annual financial statements. All of the corporations, in accordance with generally accepted accounting principles, annually develop financial statements or statements of financial position which undergo the scrutiny of an independent auditor.

As required by financial accounting standards, the corporations report expenses by their functional classification. The two primary functional classifications are program services and supporting activities. Supporting activities are generally comprised of management and general activities, fundraising, and membership development. Program services are activities that result in goods or services being distributed to beneficiaries, customers, or members that fulfill the purposes of mission for which the organization exists. In addition, the corporations segregate revenue streams to ensure that grant money and other restricted funds are correctly applied toward designated programs, equipment, or services.

***Procurement Policies and Procedures.*** Although the stations do not have a dedicated procurement officer, stations delegate responsibility for authorizing purchases to department heads or managers. The use of a purchase order system to track and authorize expenditures for the purchase of goods and/or services provides further assurances that proper authorization is obtained before funds are disbursed. When highly technical equipment, capital assets, or systems are being procured, stations require the chief engineer to authorize the purchase. Whenever possible, the stations attempt to solicit multiple bids for goods and services. The corporations make purchases using less than three bids only in cases for which the availability of vendors precludes them from doing so. Also, all of the financial officers stated that care is taken to draft contracts with “fixed price” or “not to exceed price” agreements. In addition, every effort is made to obtain the lowest responsible and responsive bidder.

Primarily, the corporations rely upon their chief engineers to evaluate the qualifications of contractors and vendors for the purchase of broadcasting or transmission equipment. The chief engineer is most familiar with the equipment and has the most information concerning the integration of new equipment with current systems. However, the financial officer and the president also provide input. Final authorization for costly capital purchases ultimately requires the president’s signature or possibly board approval.

When interviewed, all of the station financial officers articulated their standard operating procedures for procurement, purchasing, and the expenditure of funds. However, written policies were not available. The lack of written policies increases the possibility that internal controls may not be consistently followed.

Policies and procedures for handling financial transactions are best recorded in an accounting procedures manual, describing the administrative tasks and who is responsible for each. The manual does not need to be a formal document, but rather a

description of how functions such as paying bills, depositing cash, and transferring money between funds are handled. Having such a manual would also facilitate a smooth turnover of financial staff.

***Recommendation (1).*** **The public television corporations in Virginia should develop written documentation of internal control policies and procedures.**

## Corporate Boards Appear to Exercise Appropriate Fiduciary Oversight

Each public television corporation reports to a corporate board made up of members of the community with backgrounds in such areas as business and banking, industry, government, and education. The boards of Virginia's public broadcasting corporations, like other nonprofit organizations, have a responsibility to safeguard the organizations' assets, and to ensure that funds are used to further organizational goals. In addition, the boards must ensure that donor designations are honored, and that cash and investments are managed wisely. Each board exercises fiduciary responsibility for its respective corporation, and the level of board involvement in the daily operations of each corporation varies.

Most boards meet at least quarterly to receive financial reports from management. In other cases, management reports monthly to the boards. Some boards have executive committees designed to deal with budgetary and fiscal matters. All the corporations reported that, should the need arise, management will meet on an *ad hoc* basis with their boards. JLARC staff found that the level of board involvement with respect to financial oversight appears to be appropriate and sufficient to safeguard organizational assets.

## Corporations Appear to Employ Sound Asset and Investment Management

The respective boards of the public television corporations develop the overriding principles guiding investment and asset management strategies. Since each of the corporations relies upon investment income for operating revenue, sound asset management is critical to the survival of the corporations. Similarly, investment income serves as an important revenue stream for the corporations. Thus, a balance must be struck between generating returns and accessibility to funds. Under the parameters set forth by their boards, the public television corporations strive to maximize income for their organizations through the use of prudent investments.

Blue Ridge and Hampton Roads invest only in funds that can be guaranteed or insured. On the other hand, Central Virginia and Shenandoah have mixed portfolios managed by professional investors. While insured investments may not have the same return as market investments, they are very secure. In contrast, stock market investments trade greater security for potentially higher yields. Central Virginia stated that its investment strategy is analogous to that of a college or university. While each

approach has advantages and risks, the assets appear to be managed in a conscientious and prudent manner.

## Public Television Corporations Undergo Annual Independent Audits

Nonprofit corporations that receive $25,000 or more in direct or pass-through federal funding during a single fiscal year are usually required to have an audit. However, most nonprofits choose to have an audit whether or not they are legally required to do so. All of Virginia's public television corporations have annual independent audits performed. An audit tests the accuracy and completeness of information presented in an organization's financial statements. The testing process enables an independent certified public accountant to issue an opinion on how fairly the organization's financial statements represent its financial position and whether they have complied with generally accepted accounting principles.

For the year ended June 30, 1998, all of the corporations received unqualified audits from independent auditors. An unqualified opinion is issued when the accountant believes that the financial statements, taken as a whole, give a fair representation of the organization's financial picture. A qualified opinion is given when the auditor believes that the financial statements are, in a limited way, not in accordance with generally accepted accounting principles. While the financial statements are the responsibility of the corporation's management, the audits conducted in accordance with generally accepted auditing standards provide a reasonable basis for the auditor's opinion that the financial statements fairly represent the financial position of the corporations.

The auditor's management letter, which accompanies the audit, is an important indicator of the adequacy of an agency's internal accounting control structure, and the degree to which it is maintained. The management letter will cite significant weaknesses in the internal control system or its execution. In cases where no significant weaknesses are cited, the management letter will often make suggestions for improving internal controls or accounting methods. Management letters from each of the Virginia corporations were reviewed. Where any weaknesses in internal controls were reported, the corporations appear to have taken appropriate action in the following year to make improvements or correct lapses.

## Depreciation Expense Should Be Funded

As nonprofit entities, public broadcasting corporations are generally required to record the purchase of long-lasting, substantial property and equipment (such as computers, vehicles, buildings, and transmitters) as assets in financial records, and to charge a portion of the cost of those items to each year in which they have a useful life. This process is called capitalizing and depreciating fixed assets.

Depreciation expense is a non-cash expense (that is, cash is usually paid out in the year that the asset is acquired, but the expense is distributed over several years).

Particularly in an equipment-intensive and technology-related industry such as broadcasting, it is important to plan for the replacement of fixed assets as they wear out or become obsolete. For example, an organization should set aside an amount of cash equal to the amount of their yearly depreciation expense or at least a portion thereof. That way, money will be available to purchase a new asset once the current one is fully depreciated.

JLARC staff found that most of the public television corporations record on their financial statements their fixed assets and depreciate these assets. Yet, some do not actually fund their depreciation expenses. As a result, when equipment exceeds its useful life or requires replacement, corporations often do not have adequate funds on hand to make a purchase. Most of the corporations noted that in order to replace equipment, they must seek funding through grants or donations. Alternatively, one station stated that rather than purchasing expensive equipment outright, they prefer to use lease/purchase agreements. In doing so, much of the cost of equipment becomes a regular operating expense, creating a more stable cash flow from year to year. Similarly, lease/purchase agreements minimize the need to annually fund depreciation expenses.

JLARC staff found that in the majority of cases, most of the equipment that would be considered fixed assets was purchased through a grant or donation. As a result, corporations received a one-time payment designated for the purpose of purchasing a specific piece or pieces of equipment. All of the revenue for such a purchase would have been recorded in the fiscal year in which it was received. Likewise, the entire cost of the equipment would have been debited as an expense in the same fiscal year. However, the depreciation costs for the asset continue to accrue throughout its useful life. Consequently, for every year following the purchase of a grant-funded asset, depreciation costs would need to be funded. Due to budgetary constraints, most corporations do not set aside corresponding revenue to fund annual depreciation costs.

Financial planning at the public television corporations should better reflect that operations are equipment intensive. Over time, equipment will wear out or become technologically outmoded, as is the case with much of the station's analog equipment. Therefore, these corporations should not only track depreciation, but also fund it in real dollars. One independent auditor noted in his review of a station's financial statements that "the budget to actual comparison did not include depreciation expense. Depreciation expense represents a real expense of operating a business and therefore, should be included in the budget."

***Recommendation (2).*** **All public television corporations in Virginia should budget for and fund depreciation expenses and/or explore the use of lease/purchase agreements where appropriate.**

# III. Enhancements Possible with Digital Technology and the Costs of Conversion

The shift from analog to digital broadcasting, as mandated by the Federal Communications Commission (FCC), will result in a more efficient use of the available broadcast bandwidth. Within the same amount of bandwidth, stations will potentially be able to broadcast more than four times the amount of information that can be broadcast with the current analog system. This will result in enhancements that could transform television from a one-way communications medium into a truly interactive system. The public stations in Virginia are very excited about these new capabilities because of what they can add to the educational and cultural aspects of their mission.

Completing this conversion, however, is going to be very costly for the public stations, which do not have the revenue generating capacity of commercial television. To implement a fully digital replication of the current analog public television system in Virginia, the stations estimate that they will spend more than $72 million dollars. Some of this money, roughly $48 million according to the stations, will have to be spent during the next two fiscal years in order to meet the FCC mandate of broadcasting a digital signal by May 2003.

This chapter presents the results of JLARC staff's analysis of the enhancements available through digital television and the ways the public stations intend to use these enhancements to benefit the Virginia citizens they serve. It also presents the costs of realizing these benefits, as estimated by the stations, as well as future costs that the stations may face as a result of the conversion to a digital system.

Few conclusions are reached through this analysis because of the high degree of uncertainty associated with the practical application of the digital technology. However, it is clear that the digital technology presents a number of enhanced capabilities that the public stations could utilize to further their mission of serving audiences somewhat overlooked by commercial television. These enhancements are extremely relevant, at least in theory, to the largely educational mission of the public stations. In terms of cost, JLARC staff's comparison with digital conversion costs in other state systems indicated that the Virginia estimates are in the general range of costs estimated by other entities.

## THE INTENDED USE OF DIGITAL TECHNOLOGY BY VIRGINIA'S PUBLIC TELEVISION STATIONS

The shift from analog to digital technology provides broadcasters the opportunity to enhance current services, and potentially to provide a wide array of non-traditional broadcasting services to the people within their broadcast areas. These opportunities

are made possible because the digital signal is more efficient than the current analog signal. The digital signal is a stream of binary code similar to that processed by computers or encoded on compact discs. This data stream of ones and zeros is beamed to digital television sets (or adapted analog sets), which convert the signal back into images and sounds. In comparison to the analog signal, the digital signal is compressed, which allows for more information to be sent over the same signal bandwidth as that used for the analog transmission.

Because the digital signal is more efficient than the current analog signal, the digital signal provides several enhancements to broadcast television. Specifically, these include:

- improved picture and sound, including High Definition Television;
- the potential to broadcast multiple programming streams within the same bandwidth, called "multicasting;" and,
- the ability to deliver supplementary data enhancing the normal audio and video information conveyed by a program, known as "datacasting."

While the digital technology makes these enhancements available to all broadcasters who make the conversion, the precise mix of these enhancements and the specific uses are left to the individual stations, both commercial and public, to decide. This section of the report explains what these enhancements are and their current planned uses according to the public stations' discussions with JLARC staff. It should be noted that much of the technology involved in the digital capabilities presented here is still evolving. For this reason, the public stations do not have specific plans in place for digital operation, but presented to JLARC staff the things that they understood to be possible and that they would be interested in providing to their viewers.

## The Digital Technology Provides for Improved Picture and Sound Relative to Today's Analog Broadcast

Digital signals are either received over the air perfectly, or not at all. In contrast, analog signals degrade as they travel, resulting in static, or "ghosting" when viewed. Thus, when receiving a digital signal, the picture and sound are an exact copy of the original broadcast quality picture and sound broadcast from the station. In addition to this robust signal, the compressed nature of the digital signal allows for a higher level of picture resolution and sound clarity than currently available through analog broadcasts. The levels of resolution available are numerous, ranging from a picture slightly better than today's analog picture, known as Standard Definition Television (SDTV), to the pinnacle of broadcast quality, known as High Definition Television (HDTV). CD-quality surround sound can accompany each of these levels of picture clarity.

HDTV will allow for pictures with approximately twice the resolution of today's analog picture and a wide-screen view, like that of a movie screen. The ratio of screen

height to width is 16:9 for HDTV broadcasts, compared to 4:3 for the current analog broadcasts (Exhibit 2). With the high degree of picture resolution, the wide-screen format, and CD-quality sound, HDTV is a noticeably different viewing experience. The capabilities of HDTV have generated much of the excitement concerning digital transition, with PBS stating that HDTV will allow viewers to experience cultural programming as if they were attending in person.

**Exhibit 2**

**Analog Screen Size Compared to HDTV Screen Size**

Analog Picture
(4:3)

HDTV Picture
(16:9)

Source: JLARC staff graphic.

The Virginia public stations have generally stated that while HDTV will certainly be a selling point for consumers in making their decision to purchase a television capable of projecting the HDTV picture, the public stations are generally more interested in the other enhancements (discussed below) available through the digital technology. Public television viewers in Virginia will have the benefit of HDTV during the prime-time hours of broadcasting when the stations generally "pass through" the national PBS broadcast schedule (which already includes some programming available in high-definition). In terms of local capability to produce in a HDTV format, the public stations indicate this capacity, if ever realized at one of the Virginia stations, will be realized some time in the fairly distant future.

### Multicasting Provides Public Television Additional Opportunities to Serve Audiences Under-Represented in Commercial Television Programming

Perhaps more important to the mission of public television stations than HDTV, the compressed digital signal will allow for multiple programming streams to be broadcast simultaneously within the same bandwidth. This capability, known as "multiplexing" or "multicasting," is available due to the efficiency of the digital signal. While the resolution provided in HDTV programming creates a signal that occupies most of a station's available broadcast bandwidth, the resolution provided in standard definition

(SDTV) can be broadcast in a much smaller amount of bandwidth. What this means for broadcasters is that four or more SDTV programming streams can be sent simultaneously within the station's available bandwidth. What this translates to on the signal reception side is that a viewer will be able to choose from four or more programs from the same channel through some type of menu-driven navigation tool within a television set or converter box.

This ability to multicast serves to increase a station's available programming time (currently 24 hours a day per channel) four or more times within the same bandwidth currently licensed to the station. This allows the station to provide programming targeted for specific audiences at a level that the station does not currently provide due to scheduling conflicts. This opportunity is especially important to public television, for which the mission has been to serve audiences that are under-served by the mass-market approach generally followed by commercial television.

PBS, on a national level, and the Virginia public stations have recognized this enhancement as a excellent opportunity to further their mission, particularly in the area of education and government affairs. A primary example of this is a new programming package from PBS that will be available as a pass through programming stream to member stations. This "channel" is called PBS Kids Channel, and will carry repeats of current PBS series designed for children from preschool to age 12, as well as enhanced digital versions of these programs. Once stations have the ability to multicast, they will be able to broadcast the PBS Kids Channel via one of their available SDTV streams, and provide children's programming at all times of day, rather than during the morning and early afternoon only, as most of the stations currently do. This additional programming will require minimal added expenses once the infrastructure is in place that will allow the multicasting.

The Virginia public stations have indicated that the ability to multicast will also enhance the ITV programming, as well as other educational programming directed at adults, daycare providers, and home-schoolers. Presently, the amount of ITV programming and the broadcast time in which it is sent to the schools is limited to the school day itself. This is despite the fact that most of the ITV programming is taped by the schools for future use, as opposed to being viewed as it is broadcast. While the station broadcasts ITV, other potential day-time audiences do not receive programming tailored to their needs. The ability to multicast, and the resulting four-fold increase in available broadcast time, will potentially allow the public stations to address each of these separate audiences to a greater extent than currently possible.

Additionally, the Virginia public stations all indicate a willingness and desire to provide more programming related to State and local government than currently provided due to scheduling limitations. Specifically, the public stations believe that given the added capacity available through multicasting, they would be in an excellent position to provide live coverage of the General Assembly Session, should the General Assembly decide such coverage would be desirable. In addition, the stations currently provide, as part of the ITV contract, DOE-requested professional development programming to teachers across the State. The public stations see the added capacity as

an opportunity to provide this service for other State and local government agencies, as well as provide coverage of hearings, meetings, and press conferences, or meet other programming needs of government entities.

In sum, the ability to multicast simultaneous programming streams serves to increase the programming time a public station currently has available. The public stations all currently plan to multicast throughout the day except for prime-time, when they will be passing through the PBS national schedule in HDTV. While specific plans for additional broadcast time are not fully developed, it is clear that the public stations intend to utilize the added capacity to further address audiences to a degree that scheduling conflicts currently do not allow.

### The Ability to Broadcast Non-Traditional Television Content Simultaneously with Traditional Content Will Allow Public Television to Enhance and Expand Current Services

The transition to a digital standard by broadcasters and television manufacturers brings those industries in line with the technology currently utilized by the computer industry. Digital televisions will eventually have capabilities similar to personal computers, and the computers and televisions may be linked directly to each other in the future. Because the digital television will be receiving the same type of binary code that computers receive, broadcasters will be able to distribute the same type of non-traditional television content (such as text, photographs, or drawings) that computers have access to via the Internet and other venues. More importantly, the speed at which this type of information could be sent to a consumer through a terrestrial signal is many times faster than current phone and cable linkages allow.

This transmission of non-traditional television content, known as "datacasting" by the broadcast industry, can be accomplished simultaneously with the delivery of television programs. Once again, this is accomplished through the more efficient, compressed digital signal. Even when broadcasters send a program in HDTV, there is still room on the bandwidth for some amount of datacasting. This allows broadcasters the opportunity to "enhance" programs with supplemental information accessible to the viewer at the touch of a button or click of a mouse. For example, a documentary on lions might be supplemented by a datacast bibliography or a "virtual tour" of the Serengeti. A viewer could access this additional information directly during the documentary, or could have this information downloaded to a television or computer for use sometime after the program.

The Virginia public stations view this capability as an enhancement supporting their current mission, primarily that of education, and an opportunity for providing other services to the public, some of which could generate station revenue to support programming. In terms of education, ITV coordinators from each of the stations participating in that program indicate that one major benefit from this capability is that datacasting will allow them to distribute supplemental educational materials on a wider basis then current resources allow. The coordinators indicated that there is a wide

array of supplemental materials produced for a number of programs purchased through ITV. However, there is currently no cost-effective means to distribute that supplemental material. Datacasting would allow the supplemental material to be available over the air in conjunction with the program itself, thus making access to the material available "on-demand."

The use of datacasting to provide viewers with additional services, some of which could generate revenue for the stations, is presently more of a theory than a practical application. The basis of the theory, according to the public stations and others, is that broadcasters will have the ability to distribute large amounts of data in relatively short amounts of time via their digital transmitter. According to the public stations, many individuals, businesses, and even State agencies may see this capability as the most efficient way to send data to others, and the public stations could provide this service either for free or for a fee. The details of utilizing datacasting to provide additional services, and possibly to generate revenue, are not yet resolved at the federal level, nor in terms of the available technology. However, the public stations see datacasting as a potential enhancement to the current services provided to their communities.

## THE COST OF DIGITAL CONVERSION AT THE PUBLIC STATIONS IN VIRGINIA

While the Virginia public stations are excited about the capabilities and resulting service enhancements available through the digital technology, it is clear that the transition will be costly. It is also clear that the transition has been mandated by the FCC, so the stations have no choice in the matter unless they decide to relinquish their broadcast license and cease operation. With this in mind, the public stations are currently, or will be, engaging in capital campaigns to raise the money for the conversion from their historical funding sources: private individuals and corporations/foundations, the federal government, and the State.

In order to provide a basis for the capital campaigns, the Virginia public stations as a group hired a digital technology consultant, Horowitz Television Technology (HTT), to produce a consistent station by station estimate of the costs involved in the digital conversion. The results of this analysis indicate a total cost of approximately $72 million to fully replicate the current service delivery of the public stations and to take advantage of the ability to multicast and datacast. This estimated total cost does not include the ability of any Virginia station to produce HDTV in-house, but does provide the capability to pass through HDTV programming in a number of formats. In addition, the $72 million does not include the necessary upgrade or system change involved in connecting the stations to each other, which the current system accomplishes through the statewide microwave network.

An important point to remember in the discussion of the costs of the digital conversion is that these costs are still changing. The report produced by HTT for the

stations was based on price quotes made directly to HTT or to the stations themselves. These quotes represent a price at a point in time and do not reflect market conditions since that time. In addition, the notion of "group buys" and other cost reduction strategies are not used by the HTT report because they are currently not quantifiable. HTT concludes in the report that overall costs could vary as much as 20 percent from the estimate (either up or down).

This section of the report examines the cost estimates produced by HTT on behalf of the public stations in greater detail and in the context that some degree of uncertainty still exists in digital cost estimation. This section of the report then discusses the options available for the statewide interconnection and the costs associated with those options. Finally, this section discusses possible future costs associated with the change to digital broadcasting.

## The Public Stations' Estimated Costs Appear Consistent with Estimates from Other States' Public Television Systems

Since JLARC staff are not in the position to develop independent estimates for each station's digital conversion, the report titled *The Transition to Digital Television of Virginia's Public Television Stations* by Horowitz Television Technology has been used as the most current and consistent cost estimate for the digital conversion in Virginia. Table 2 shows the total conversion cost for each station, and detailed cost estimates from the HTT report are reproduced in Appendix C. The cost variation between the stations controlled by each of the four public television corporations is generally related to each corporation's "flagship" station costing significantly more to convert than the other stations within the corporation. The costs for the flagship station are higher because it is generally at this station where the programs originate (they are received by satellite or produced in-house, for example, at one location). Each of the other stations controlled by the corporation generally re-transmit programming originating from the flagship station with very little modification or on different broadcast schedules. The situation in Northern Virginia is somewhat different, where the two stations attempt to serve different audiences and therefore have different programming acquisition needs.

Each public television corporation has stated that the costs found within this report accurately reflect their current estimate of the costs they will incur. To determine if the costs seem reasonable, JLARC staff have examined the estimates as they relate to estimated costs from other states' public television systems. Further, this section of the report provides a description of the components and costs associated with meeting the FCC mandate and further utilization of the digital technology.

***Comparison with the Costs of Other States' Public Television Systems.*** Comparison of digital conversion costs across stations and across states is made difficult by the varying needs of the individual stations, and because of the varying time periods in which the purchases or estimates are made. For example, if a station's

**Table 2**

## Estimated Cost of Digital Conversion for Virginia Public Television Stations

| Station | Conversion Cost |
|---|---|
| **Blue Ridge Public TV** | |
| WBRA – Roanoke | $9,796,976 |
| WMSY – Marion | 1,659,407 |
| WSBN – Norton | 1,991,907 |
| **Central Virginia Public TV** | |
| WCVE – Richmond | 9,297,914 |
| WCVW – Richmond | 3,454,114 |
| WHTJ – Charlottesville | 1,685,000 |
| WNVC – Falls Church | 9,556,051 |
| WNVT – Goldvein/Fredericksburg | 11,546,405 |
| **Hampton Roads Public TV** | |
| WHRO – Hampton/Norfolk | 9,277,493 |
| **Shenandoah Valley Public TV** | |
| WVPT – Harrisonburg/Staunton | 12,405,311 |
| WVPY – Front Royal | 1,068,728 |
| **Total** | $71,739,306 |

Note: In addition to the 11 recognized Virginia stations, WETA has estimated its digital conversion costs to be $10.5 million, of which $2.5 million has already been incurred.

Source: Horowitz Television Technology report for Virginia public television stations.

current analog antenna is housed on a tower with no additional capacity for the digital antenna, the station will need to construct a new tower. This could serve to increase an individual station's costs by more than a million dollars depending on the type of tower needed.

However, with these limitations in mind, JLARC staff attempted to examine the Virginia cost estimate in relation to other states' cost estimates. Specifically, JLARC staff solicited digital conversion cost estimates from seven other states either in the general area or with similar systems to that of Virginia. To facilitate comparison, JLARC staff used a station average cost (per transmitter) in this analysis. Using this average station cost for each state served to mitigate the variation in the individual stations' estimated costs, as illustrated for the Virginia stations previously in Table 2. Table 3 presents the results of that analysis.

**Table 3**

## Comparison of Average Station Cost in Virginia to Average Station Cost in Other States

| State | Number of Transmitters | Total Estimated Digital Conversion Cost | AverageCost Per Station |
|---|---|---|---|
| Maryland | 6 | $39,960,550 | $6,660,092 |
| North Carolina | 11 | 62,386,704 | 5,671,519 |
| Pennsylvania | 8 | 49,970,000 | 6,246,250 |
| South Carolina | 11 | 40,931,000 | 3,721,000 |
| Ohio | 12 | 84,075,868 | 7,006,322 |
| New York | 9 | 64,700,000 | 7,188,889 |
| Florida | 14 | 107,600,000 | 7,685,714 |
| **Other State Total** | **71** | **$449,624,122** | **$6,332,734** |
| **Virginia** | **11** | **$71,739,306** | **$6,521,755** |

Source: JLARC staff analysis of data obtained via telephone interview with representatives of the public television systems from the other states listed above and of the report titled *The Transition to Digital Television of Virginia's Public Television Stations* by Horowitz Television Technology.

As can be seen from Table 3, the average cost per station for Virginia is similar to average costs in six other states, especially if one considers the 20 percent margin of error expressed by HTT in the Virginia report. South Carolina stands out from the other states as having a lower average cost. This may be because that system is a centrally run state system that may experience some cost economies as a result (for example, the stations may all be served from one central production facility).

In addition to the seven states contacted directly by JLARC staff, staff examined state cost estimates provided by a national organization, America's Public Television Stations (APTS), through the Virginia stations. This data clearly indicated that the Virginia estimates were of the same magnitude of many of the other states' estimates; however, direct comparisons were not possible because of the lack of information about what was included in some of these other state estimates. In conclusion, while JLARC staff did not attempt to produce an independent cost estimate for each of the Virginia public stations, it is clear that the magnitude of the costs presented by HTT on behalf of the stations is in the expected range as compared to other estimated costs.

***Meeting the FCC Mandate and the Ability to Multicast and Datacast.*** The mandate issued by the FCC requires the public stations to transmit a digital signal continuously by May 1, 2003. The mandate does not refer to content, nor does the mandate refer to the enhancements that will be available through multicasting and

datacasting. However, the public stations have generally stated that it will be more cost effective for them to acquire the ability to multicast and datacast as part of the basic transmission overhaul. In sum, the stations estimate that completing the conversion of the basic transmission, plus adding the capacity to multicast and datacast, will cost approximately $48 million.

Specific to this part of the total conversion, each station will need to purchase and install a new antenna and transmitter. Costs for these two items and associated hardware and installation at each station range from approximately $600,000 to $1,400,000 depending primarily upon the power needed. It is possible that some new towers would need to be constructed as well. This appears to be an issue for the three stations licensed to the Blue Ridge Public Television, Inc. and WHRO in Norfolk. However, due to the elevation of the sites at which BRPT would be constructing new towers, the estimated costs of these towers are substantially less than the potential tower costs mentioned above. Also, WHRO is currently negotiating a tower agreement that could defray much of the cost of a new tower.

This part of the conversion would also cover the link necessary to get a signal from a studio or satellite downlink to the transmitter and antenna. As part of the ability to broadcast, stations will have to convert their master control, monitoring, and playback/recording systems as well. Within these components, the stations have included the costs associated with acquiring the ability to multicast and datacast, and the ability to automate these functions somewhat. While this is clearly beyond the May 2003 mandate, the stations argue that it is cost-effective to purchase the equipment capable of these enhancements during the basic conversion rather than trying to add them into the system later. Also included in this phase is some production equipment, such as digital SDTV-ready cameras.

At the completion of the basic transmission overhaul (the first two phases envisioned in the HTT report), the stations will have spent approximately $48 million to meet the FCC mandate and to acquire the ability to multicast and datacast. In addition, they will have purchased some basic digital production equipment. At this point, the stations would be able to acquire HDTV programming and rebroadcast the program as HDTV or down-converted to SDTV. The stations would still have very limited production capability in a standard definition format. In order to replicate the production capability presently available to the public stations, more conversion would need to take place.

***Replicating Today's Public Television Service Through the Digital Conversion.*** The final phase of the digital conversion of the station infrastructure is the full replication and enhancement of the current services provided by the public stations. The stations estimate that this phase will cost an additional $24 million above the $48 million estimated for the basic transmission costs. Within this phase, stations will acquire the capacity for full automation of the multicast channels and additional storage capacity for both SDTV and HDTV programming. Stations will also acquire the remaining components necessary for digital production (audio consoles,

teleprompters, microphones, and lighting, for example) and editing (including digital graphics systems). Once this phase is complete, the stations would be able to replicate current production in a standard definition digital format. The costs of this phase do not include the capacity for production of programming in high definition at any of the stations, as the costs associated with that equipment are much higher. It should be noted that the majority of programming aired on the public stations is not produced in-house, with most stations airing only one or two hours of in-house programming in a typical week.

## The Issue of the Statewide Interconnection of Virginia's Public Stations Is Not Yet Resolved

In addition to the conversion at the individual stations, the stations must be interconnected with each other to truly replicate the current service of the Virginia public stations. Each public television corporation currently maintains portions of the statewide terrestrial microwave system of receivers and transmitters that serve to connect each station to the others and to other entities. The interconnection of the public stations is currently used for program exchange and for statewide distribution of teleconferences, programs, and distance learning. In terms of its value to State government, the interconnection provides instant access to almost every citizen of the Commonwealth through broadcast television.

The current microwave system is not digital-compatible, so this system will need to be converted to a system capable of handling digital transmissions. The current options available to the public television stations are the use of satellite, digital microwave, or fiber optics. Of those three choices, HTT determined that satellite interconnection would require significantly higher total costs (specifically, the yearly operating cost of leasing a satellite transponder) than would connection through digital microwave or fiber. The public stations have stated publicly that their preferred digital interconnection is via fiber, specifically NetWork Virginia, as opposed to upgrading the current microwave system. NetWork Virginia is a private system of fiber optic cable, under contract to the State and local governments, connecting sites across the State. It is currently installed at over 600 locations including many State agencies and institutions of higher education. Organizations subscribe to the service, much like subscribing to telephone service, and pay monthly service fees depending on the level of service desired.

The upgrade of the current microwave system would require an additional up-front capital expenditure on the part of the public stations. This cost is estimated by HTT to be an additional $7.2 million across the 11 stations. Once this initial expenditure is made, maintenance costs would be a relatively minor operating expense on the part of the stations (similar to their operating expenses associated with the current microwave system), but could increase over time as the equipment ages. Use of NetWork Virginia would require a smaller initial investment on the part of the stations (estimated at $4.8 million by HTT) but stations would pay substantial monthly service charges (estimated by HTT at about $5,000 a month per station for the service neces-

sary for the video exchange). This would obviously impact the stations' operating budgets. HTT has estimated that over the long-term, the differences in the costs of these two approaches are minimal. It should be noted that the HTT report indicates that a more detailed analysis of the costs and other factors associated with Network Virginia and a digital microwave system would be prudent.

The stations have stated that they prefer the NetWork Virginia option because there is within that system the ability to upgrade and expand as the digital technology and the application of that technology changes. Once the microwave system is in place, according to the stations, it would be hard to change the capabilities of that system without another complete overhaul. The stations also point out that because so many State agencies and educational institutions are already a part of NetWork Virginia, it is a natural step for public television to be directly linked to the entities which would benefit directly from the services available from the public television stations through the digital technology.

***Recommendation (3).*** **If the Public Broadcasting Board intends to recommend State funding for the replication of the current interconnection of the Virginia public television stations, the Board, with the assistance of the public stations, should provide a detailed comparison, including costs, of the options available for statewide interconnection and a recommendation indicating a preferred option. This report should be provided to the General Assembly and the Governor prior to the 2000 General Assembly Session.**

## The Digital Conversion Will Carry Additional Future Costs Not Addressed in the Current Cost Estimates

In addition to the infrastructure costs associated with the digital conversion at the stations themselves, and the capital cost associated with upgrading the microwave system or the yearly operating costs of subscribing to NetWork Virginia, stations are likely to face increased programming acquisition costs as well. As stated previously, the vast majority of programming aired on public television, both general programming and ITV programming, are acquired for a fee from sources outside the station itself. With the added programming capacity available through multicasting, it is likely that the stations will need to acquire additional programming to fill the air time. The extent to which this will be necessary is currently unclear, and the stations do state that they have libraries of programming that could help to fill these additional "channels."

In addition to the possibility of the increased need for programming, it is likely that the costs of purchasing the programs will increase as well. As the production standard switches from analog to digital, producers will have to convert their studios and equipment. The additional costs associated with these conversions will most likely be passed on to the consumers, including the public stations, in the form of higher prices. Again, the extent to which this will be a continuing factor that the stations

must address through their operating budgets is currently unclear, but it is possible that the stations will seek increased appropriations in future State budgets for the ITV and CSG programs to help alleviate the additional programming acquisition costs.

Besides the potential for increased annual operating costs associated with program acquisition, stations are likely to face some increased operating costs due to the FCC requirement to operate both digital and analog broadcast equipment simultaneously for some time, and due to the stations' desire to operate four or more separate broadcast streams through the digital multicasting capability. The stations may incur more expenses related to staffing and electrical power, for example, during the time in which stations broadcast in both digital and analog signals. It is clear that operating two transmitters instead of one will not result in twice the operating expense, but given the uncertainty relating to the amount of time the digital and analog signals will have to be simultaneously operated, these added costs could become substantial.

In terms of operating four separate broadcast streams through multicasting, it is possible that a shortage of manpower could become an issue. However, the stations have made it clear that in its final form, the infrastructure at the stations will be highly automated in terms of the multicast program streams. Also, possible revenue generation obtained through the capabilities provided by multicasting and datacasting could serve to offset some of the additional operating costs.

Finally, if the ITV program is to continue after the digital conversion, and if it is going to take full advantage of the additional capabilities offered through the digital technology, the thousands of schools across the State will have to purchase the equipment to receive the programming. Current television sets will eventually become obsolete without a converter, and it is unclear if the converters will be able to take full advantage of the multicast and datacast capabilities. As most schools currently record programming for later use, current recording equipment may have to be replaced. On the other hand, receiving the enhanced ITV signal from the public stations may be as simple as inserting a digital television card into the computers currently in use at most schools. The Department of Education should take the lead in determining how Virginia schools will acquire digital television technology and how the associated costs will be funded. The Department of Education should ensure that the General Assembly is made aware of the local school division costs associated with the conversion to digital television.

***Recommendation (4).*** **The Virginia Department of Education, with assistance from the local school divisions, should prepare a plan for deployment of digital television technology in Virginia schools, and should identify the resources required to implement such a plan. The Department should report its plan and associated cost estimates to the House Appropriations, Senate Finance, and House and Senate Education committees prior to the 2001 Session of the General Assembly.**

# IV. Funding the Digital Conversion at the Virginia Stations

Public television stations have historically received funding from three major sources: the federal government, State government, and private donations. In federal fiscal year 1997 (the most recent figure available), public television stations nationwide had an income of approximately $1.5 billion. The largest source of income was from private donations (station membership and business donations/underwriting), which provided over $540 million (36 percent). State governments provided nearly $274 million (19 percent), while federal funds totaled approximately $251 million (17 percent). The remaining sources of income were primarily public and private colleges, local governments, foundations, and auctions.

For the digital conversion, public stations in Virginia and across the country are expecting these three major sources to provide the needed funding. Each of these funding sources will be used by the stations to leverage additional funding among the other sources (much of the federal and State funding in the past and present have required matching funds, for example). Currently, the status of funding the digital transition in Virginia is undetermined because the levels of funding available from these three historical sources are undetermined. This chapter first discusses what funding may be available from the traditional non-State sources. Secondly, options for State support are provided in the context of certain criteria that the General Assembly may wish to consider if the decision is made to provide additional funding for the digital conversion.

The results of this analysis indicate that federal funding at some level is likely, and it could be as much as $750 million nationally. However, there is significant uncertainty regarding both the level of federal funding that will be available, and the method by which these funds will be distributed. These two issues will have serious implications for the amount of federal conversion funds received by the Virginia stations. In terms of private funding for the conversion, the public television corporations in Virginia are planning, or have already begun, to engage in capital campaigns soliciting local support from business and individuals.

In terms of State funding for the conversion in Virginia, it is clear that many other states across the country have already obligated significant public funds for the conversion of stations within their political boundaries. In Virginia, if public funds are provided for the conversion, it is reasonable to expect that they should be allocated to the individual public television corporations based upon a combination of factors relating to the equity of station resources, efficiency of service coverage, and degree of public service to Virginia's citizens.

## DIGITAL CONVERSION FUNDING FROM NON-STATE SOURCES

In order to be able to convert to the digital broadcasting capability, the public stations in Virginia are expecting added support from the federal government, and are going to their viewing audiences, both individuals and businesses, to ask for increased support. The extent to which these two traditional non-State funding sources will contribute to the conversion costs is currently unknown. In terms of the federal support, it is also currently unclear as to which organization, the Corporation for Public Broadcasting (CPB) or the Department of Commerce's Public Telecommunications Facilities Program (PTFP), will distribute the majority of the funds to the individual stations. This section of the report presents the current status of federal and private funding for the digital conversion.

### Federal Funding for the Conversion Is Likely, but the Amount Available Is Not Known at this Time

While the Virginia public stations are clearly excited about the opportunities they will be given through the digital technology, it is also clear that they have little choice in the matter. Broadcasters across the country view the conversion as a federal mandate issued by the FCC. The conversion must take place, or the stations will lose their license to broadcast. While commercial stations generally have more revenue available to fund this mandate, public stations' revenue is much more limited, as the public stations are all not-for-profit entities. Thus, for the public stations in Virginia and across the country, the mandate poses a significant challenge in terms of finding the funds to accomplish the conversion.

Currently, there has been no formal commitment of federal funds for the digital conversion of public stations across the county. However, there are significant sums of federal money being proposed for use by stations for the conversion which have yet to be acted upon by Congress. In addition to the uncertainty surrounding the amount of federal funding that will be made available, the method by which the stations receive funding is also currently unclear.

***The Amount of Federal Funds that Will Be Available Is Unknown.*** In the absence of a commitment of federal funds for the digital conversion, many in the public broadcasting arena are calling the conversion an "unfunded federal mandate." Congress had authorized $15 million for the current federal fiscal year (FFY), but this money has yet to be appropriated due to the lack of a re-authorization of CPB. Both CPB and PTFP have continued to provide funding to public broadcasters, but have not yet received any appropriations specific to the digital conversion. However, staff of PTFP have stated in an interview with JLARC staff that most of the PTFP funding over the past few years has been used for purchases of digital-ready equipment (PTFP provided about $19.8 million to 115 recipients in FFY 1998).

There are currently two federal proposals with funding recommendations for the digital conversion at the public stations. The first is the President's proposed budget which outlines a five-year provision of approximately $450 million starting in Federal Fiscal Year 1999. Specifically, the President's proposal would provide $355 million over five years to PTFP to help fund "broadcasters' acquisition of core digital transmission and base equipment...." CPB, on the other hand would utilize its $95 million appropriation to "support necessary investments related to digital program production, development and distribution associated with the transition of public broadcasters to digital broadcasting." Table 4 presents the proposed five-year funding through the President's proposed budget.

The second proposal for federal fund support of the digital conversion at the public stations is currently found in House Resolution 2384. This bill would authorize funding for CPB, including $415 million specifically earmarked for "costs associated with the transition of public broadcasting to provide digital broadcasting services, including for the support of digital program production, development, and distribution."

**Table 4**

## Proposed Federal Funding for the Digital Conversion of Public Television (in Millions)

| Federal Funding Source | FFY 1999 | FFY 2000 | FFY 2001 | FFY 2002 | FFY 2003 | Five Year Total |
|---|---|---|---|---|---|---|
| **Proposed Funding through the Executive Budget** | | | | | | |
| Corporation for Public Broadcasting | $15 | $20 | $20 | $20 | $20 | $95 |
| Public Telecommunications Facilities Program | $21 | $35 | $110 | $100 | $89 | $355 |
| Total Federal Support | $36 | $55 | $130 | $120 | $109 | $450 |
| **Proposed Funding through H.R. 2384** | | | | | | |
| Corporation for Public Broadcasting | $15 | $100 | $100 | $100 | $100 | $415 |
| Public Telecommunications Facilities Program | NA | $35 | $110 | $100 | $89 | $334 |
| Total Federal Support | $15 | $135 | $210 | $200 | $189 | $749 |

Source: JLARC staff analysis of the Budget of the United States Government, Fiscal Year 2000 and H.R. 2384.

In addition to the $415 million to CPB, the bill would authorize PTFP to distribute grants totaling $334 million "to assist in the planning and construction of public telecommunications facilities, including analog and digital facilities...." In total, this bill would authorize nearly $750 million to help fund the digital transition at the public stations across the country (Table 4).

As these two proposals illustrate, it is likely that some federal funding will be available to the public stations in Virginia to help with their conversion to digital. However, the exact amount available for the national system of public television will most likely change from either of the amounts presented above.

***The Method by Which Federal Funds Will Be Distributed Is Unknown.*** While the precise amount of total federal funds available to the national system of public television stations has not yet been determined, the way in which these eventual funds are distributed will also play an important role in determining how much money is received and how that money can be spent. The two major federal sources of funding for public television will have differing roles in funding the conversion, and may have differing methodologies in distributing funds. Specifically, both proposals presented above indicate that CPB funds may be tied somewhat to production-related digital expenses, while PTFP funds would be used for equipment purchases and construction. This may serve to limit how federal monies could be spent by the individual stations once they are obtained from the two federal sources.

In addition, it is not clear how the eventual funding will be distributed to the stations themselves. CPB has historically provided funds to stations based upon developed formulae, such as that utilized in the federal Community Service Grant program. Under the formulae, eligible stations can expect to receive a set portion of the total funding available. Due to limited funding, PTFP on the other hand has distributed funds based primarily upon a competitive process, in which stations submit grant applications which are judged somewhat in relation to the other applications received. Under the President's proposed funding, the vast majority of the digital conversion funds would be distributed by PTFP.

According to an interview with JLARC staff, PTFP has not yet determined how it will distribute the digital funds it is eventually charged with distributing. It is clear in the proposed budget language, however, that PTFP funding would be provided "through merit- and need-based grants" as current funding is provided. What this means for individual stations is that there is a significant possibility that they will have to compete for a large portion of total federal funding which, according to current proposals, at best would meet less than half of the $1.8 billion system-wide conversion cost estimated by CPB. This could result in some stations, including some in Virginia, not receiving any digital conversion funds from at least one of the two major federal sources of funding for public broadcasting.

### All of the Virginia Stations Are in Various Stages of Campaigns to Raise Money for the Conversion, and Some Money Has Already Been Set Aside

While pursuing digital conversion funding from both federal and State government sources, the Virginia public stations have also recognized the need to solicit additional support from individuals and businesses within their viewing areas. Therefore, each of the four public television corporations are currently in varying stages of executing capital fundraising campaigns to support the digital conversion. During initial interviews with JLARC staff, the stations indicated that they had set a general goal of raising one-third of the total conversion costs from private sources of revenue. In terms of the cost estimates presented by Horowitz Television Technology (presented in Chapter III), this translates to a goal of approximately $24 million dollars statewide.

Currently, the stations are in the very early stages of these capital campaigns. As of June of this year, WHRO had raised approximately $2.1 million towards its overall WHRO Foundation fundraising campaign (a major part of this being the digital conversion). WVPT has set aside $1 million in a special digital transition fund to which it hopes to add funds as they are raised. Both Central Virginia and Blue Ridge are still in the very initial stages of fundraising for the digital conversion. The extent to which the stations are successful in raising private support for the conversion remains to be seen, but given the magnitude of the costs involved, the stations should be encouraged to continue and intensify fundraising efforts.

## STATE FUNDING OPTIONS TO HELP FUND THE CONVERSION

There is currently no basis upon which to make a single recommendation as to what extent, if any, the State should participate in funding the digital conversion at the public stations. While the costs of this transition can be estimated to some degree, the potential benefits provided by public television to the citizens of the Commonwealth are not so readily quantifiable. This renders the decision to help fund the transition that of a policy choice left to the General Assembly based upon information presented in this report, by the public stations, and by constituents and other parties.

However, JLARC staff have attempted to provide information and analysis that may be useful to the General Assembly as it decides how to distribute State funds, if the decision is made to help fund the conversion. Specifically, JLARC staff have attempted to provide information on what other states are doing to help fund the digital transition at their public television stations. In addition, there are certain factors that the General Assembly may wish to consider in distributing whatever State funds are made available. These factors relate to three criteria — equity, efficiency, and public service — that may help guide the decision concerning how any State money is disbursed. Potential funding options based upon the criteria and related factors are

presented as illustrations of how funding could actually be distributed at an illustrative level of State support.

## Other State Governments Are Providing Funds for Digital Conversion

In order to provide options for funding decisions made by the General Assembly for the digital conversion, JLARC staff examined information on how other state governments were approaching the issue. As background, it is important to note that in some states, public television is operated by some level of state government. Maryland and South Carolina, for example, are state networks which are operated by established state agencies. Obviously, state governments may have a greater obligation to fund more fully the transition in such state networks. North Carolina is primarily a state university-run public television system (although one station in North Carolina holds a community license). Again this may imply a greater funding responsibility for the state relative to a system such as Virginia where each station is an independent community licensee.

With these differences in mind, JLARC staff contacted America's Public Television Stations (APTS), a national advocacy organization for public television stations, for information on other state funding for the digital conversion. APTS has been serving as a clearinghouse of information related to the digital conversion available to the public stations across the country. JLARC staff attempted to obtain other state funding information from both CPB and PBS, but only very limited information was available from these two sources. Table 5 presents the most current information obtained by JLARC staff from APTS on state funding for the conversion. It should be noted that the cost estimates presented are not necessarily comparable with each other because in some cases they only represent stages of the conversion. It should also be noted that in many cases, the appropriations listed are only part of a multi-year funding plan on the part of the state governments. Subsequent funding requests may be planned and in some cases have been formally and informally agreed upon by the state governments.

As Table 5 illustrates, states across the county have already made significant contributions to the digital conversion of public television. In total, current funding represents about one-quarter (on average) of the current estimated costs in these states. The funding mechanisms employed include primarily general funds and issuance of bonds. In some cases, state funding is contingent upon federal funding, and will revert back to the state if other funding sources are found (primarily federal) that meet the conversion funding needs at the stations. For example, of the $15.6 million in state funds that the Louisiana State Legislature has committed for the conversion, $12.3 million is contingent upon federal matching funds. In Florida, the public broadcasters have proposed that each station be required to match state funds with federal or local contributions as well. Because of the uncertain nature of other sources of funding for the digital conversion, the State may also want to consider provisions for the reversion of funds.

**Table 5**

## Current State Funding of the Digital Conversion as Reported by America's Public Television Stations (APTS) as of 06/30/99

**(State-run public television networks are italicized)**

| State | Appropriated or Approved Funding | Estimated Conversion Cost | Percent Funded by State (to date) |
|---|---|---|---|
| *Alabama* | *$2,550,000* | *$20,000,000* | *12.8%* |
| *Arkansas* | *10,000,000* | *20,000,000* | *50.0* |
| California | 5,000,000 | 95,000,000 | 5.3 |
| Connecticut | 10,000,000 | 23,000,000 | 43.5 |
| Florida | 5,000,000 | 101,000,000 | 5.0 |
| Illinois | 22,000,000 | 66,000,000 | 33.3 |
| Indiana | 20,000,000 | 32,000,000 | 62.5 |
| *Iowa* | *2,150,000* | *32,000,000* | *6.7* |
| *Kentucky* | *6,000,000* | *68,000,000* | *8.8* |
| *Louisiana* | *15,590,000* | *26,000,000* | *60.0* |
| *Maine* | *2,000,000* | *11,400,000* | *17.5* |
| *Maryland* | *11,050,000* | *40,000,000* | *27.6* |
| Massachusetts | 3,000,000 | 22,000,000 | 13.6 |
| Mississippi | 7,900,000 | 17,600,000 | 44.9 |
| *Nebraska* | *44,350,000* | *59,000,000* | *75.2* |
| *North Carolina* | *1,000,000* | *56,500,000* | *1.8* |
| *North Dakota* | *415,000* | *11,000,000* | *3.8* |
| Ohio | 12,000,000 | 28,000,000 | 42.9 |
| Pennsylvania | 16,600,000 | 50,000,000 | 33.2 |
| *Rhode Island* | *4,606,967* | *4,606,967* | *100.0* |
| *South Carolina* | *10,000,000* | *41,200,000* | *24.3* |
| Wisconsin | 750,000 | 55,000,000 | 1.4 |
| **TOTAL** | **$211,961,967** | **$879,306,967** | **24.1%** |

Note: Estimated conversion costs and current funding levels and percentages are in some cases related to phases of the conversion. Additional costs will be incurred in these instances, and additional funding has been or will be requested. In some instances, state governments have made formal or informal agreements to provide additional future funding which has not yet been officially approved or appropriated, and therefore does not appear in this table.

Source: JLARC staff analysis of data provided by America's Public Television Stations (APTS), as reported to APTS voluntarily by public stations as of 06/30/99.

***Recommendation (5).*** **If the General Assembly decides to provide funding to the Virginia public stations earmarked for the digital television conversion, the General Assembly may wish to require that State funds be matched from other funding sources. Further, the General Assembly may wish to employ mechanisms that would allow funding to revert back to the State in the event that other sources of funding become available that could fund part or all of the State share, or if current cost estimates prove to be too high as market conditions change.**

## Certain Criteria and Factors Should Guide Potential Funding by Virginia State Government

While it is clear that each of the public stations in Virginia is facing considerable costs in meeting the mandate for conversion, it is also clear that some stations are in a better financial position to absorb the costs than others. It appears, however, that the Public Broadcasting Board will be recommending to distribute whatever State funds are made available to the individual stations on the basis of the stations' percentage of the total cost of the conversion. For example, Central Virginia Public Television's estimated conversion cost for its five stations is approximately $35.5 million. This is nearly half of the system wide cost of $72 million. Thus, Central Virginia would get nearly half of the funding made available from the State for the digital conversion, according to the advice of the Public Broadcasting Board.

While this cost-proportional approach is certainly an option, JLARC staff have developed three criteria that if followed may provide a more reasonable approach to the distribution of whatever State funds may be made available. Specifically, the General Assembly may wish to base any funding distribution on the goals of equity of station resources, efficiency in service coverage, and the degree of public service provided. These three criteria and resulting factors for consideration in funding options are presented in more detail below.

***Equity of Station Resources.*** In the examination of the four corporations which hold public broadcasting licenses in the State, it is apparent that they face distinctly different challenges in meeting the costs of the digital conversion. It is obvious that some stations currently have greater resources to help fund the conversion than do others. Also, it is apparent that some stations have a much broader base from which to raise private contributions for the digital conversion. State funding, therefore, may need to be based somewhat upon equalizing this apparent inequity in financial resources across the stations, as accomplished by incorporating the following factors: (1) the ability to leverage funding with current assets, and (2) the potential effort to raise additional private contributions for the conversion.

In terms of the ability to leverage funding with current assets, JLARC staff examined each corporation's financial statements to determine the ratio of net assets held by the corporations to the estimated cost of the digital conversion. This measure serves to indicate the ability of the stations to utilize those assets for the conversion, be it through liquefying investments or through leveraging debt based upon the collateral available in those assets, for example. Net assets do not in any way represent cash on hand for the conversion, but do serve as a proxy for a stations ability to absorb at least some of the conversion costs through liquefying assets or using those assets to leverage debt. Table 6 presents the results of that analysis.

The analysis clearly indicates that the costs associated with the conversion will be significant in terms of current assets for each of the corporations. However, the fourth column of the table shows that relative to each other, Blue Ridge and Shenandoah Valley, and Hampton Roads to a lesser extent, face a much greater financial challenge

**Table 6**

## Ratio of Estimated Costs of the Digital Conversion to Station Net Assets

| Corporation | Estimated Conversion Costs | Net Assets (1998)* | Ratio Costs/Assets |
|---|---|---|---|
| Blue Ridge Public TV | $13,448,290 | $5,253,109 | 256% |
| Central Virginia Public TV | 35,539,484 | 34,664,530 | 103% |
| Hampton Roads Public TV | 9,277,493 | 6,122,129 | 152% |
| Shenandoah Valley Public TV | 13,474,039 | 5,245,423 | 257% |
| **TOTAL** | **$71,739,306** | **$51,285,191** | **140%** |

* Net assets for Central Virginia, Hampton Roads, and Shenandoah Valley include assets for radio operations in addition to television, as these could not be separated out.

Source: JLARC staff analysis of financial statements from each of the four public television corporations.

to funding the conversion than does Central Virginia Public Television. For example, while Central Virginia's net assets are roughly equal to the cost of the conversion, Blue Ridge and Shenandoah Valley face costs that are two and one-half times the 1998 net value of the corporations. This factor could be considered in distributing available State funds for the conversion to help make the resources available to the stations more equitable across the State.

In terms of the potential effort to raise additional private contributions for the conversion, it is reasonable to expect that the ability to raise money may rely heavily upon the base available to a station from which it can draw those contributions. Analysis of the current State Community Service Grant (CSG) formula indicated that 30 percent of the available funding is granted based upon the proportion of non-state income (federal and private) raised by the stations. This factor in the CSG formula, however, does not equalize the field, so to speak, in terms of the populations from which the contributions are raised.

In other words, Central Virginia or Hampton Roads have higher populations and more businesses to solicit for financial support than do Blue Ridge or Shenandoah Valley. This consideration appears to be unaddressed in the current State CSG formula, as well as in the federal CSG formula (although other federal grant programs are available for smaller stations). In order to examine the relative effort to raise private funds by the four corporations, JLARC staff examined each corporation's level of membership contributions and underwriting (the two consistent sources of private contributions) relative to the demographics of the respective viewing areas. In terms of these demographics, JLARC staff used separate measures of personal income (to represent the economic base of individuals) and wage and salary disbursements (to repre-

sent the economic base of businesses) for each of the counties and cities within the specific viewing areas as a representation of the monetary base in those areas. In areas of overlap, the relevant cities and counties were included for each station. JLARC staff produced an analysis of the relative effort made to raise private funds by comparing the actual money raised by the corporations to each of the two indicators of the economic base. Table 7 presents the results of this analysis.

The table indicates that some corporations make a proportionally greater effort than do others in terms of raising funds from individuals and businesses within their respective viewing areas. Hampton Roads, for example, would potentially raise more than three times the amount raised in FY 1998 if the economic base from which it draws individual contributions was similar to that of Central Virginia. This effort has not been considered in previous formulae that only consider total dollars raised and reward stations for those total dollars. In terms of funding for the digital conversion, this analysis illustrates that certain stations will have a much greater potential to raise private contributions for the conversion than will others. Once again, in order to promote more equity in station resources in making the conversion, this factor could be considered in any State funding that becomes available.

**Table 7**

## The Relative Effort Made by the Public Stations to Raise Private Funding (In Millions of Dollars)

| | Individual Contributions | | | Business Contributions | | |
|---|---|---|---|---|---|---|
| Corporation | Actual Individual Contributions (FY 1998) | Viewing Area Personal Income (1997) | Percentage of Personal Income Raised | Actual Business Contributions (FY 1998) | Viewing Area Wage and Salary Disbursement (1997) | Percentage of Wages and Salary Raised |
| Blue Ridge Public TV | .9 | 25,307 | 0.004% | .2 | 10,850.5 | 0.002% |
| Central Virginia Public TV | 2.2 | 115,509 | 0.002% | 1.8 | 49,075.4 | 0.004% |
| Hampton Roads Public TV | 2.5 | 36,209 | 0.007% | .4 | 12,768.5 | 0.003% |
| Shenandoah Valley Public TV | .5 | 16,907 | 0.003% | .1 | 5,934.0 | 0.002% |

Notes: Wage and salary disbursements were only obtained for private sector employment within the State of Virginia.

Source: JLARC staff analysis of station financial statements, of wage and salary data provided by the Virginia Employment Commission, and of personal income data provided by the United States Department of Commerce, Bureau of Economic Analysis.

***Recommendation (6).*** **If State funding is provided for the digital conversion of Virginia's public television stations, the General Assembly may wish to consider the equity of station resources in disbursing State funds. This would help to ensure that stations facing a greater financial burden, in terms of their relative worth and ability to leverage additional funds, would receive proportionally more financial support from the State to meet the conversion mandate.**

***Efficiency in Service Coverage.*** Another criterion the General Assembly may wish to use for digital conversion funding is the efficiency in service coverage. Specifically, there are three areas of the State in which public television service is somewhat duplicative for viewers of the Virginia stations. In addition, a large percentage of Virginia residents in Northern Virginia receive public broadcasting from both Central Virginia Public Television, licensed in Virginia, and WETA, licensed in Washington D.C. The extent to which State funds are expended to continue these areas of coverage overlap is an issue that the General Assembly may wish to consider if funds are appropriated.

In roughly the same viewing area in central Virginia, Central Virginia operates two channels, WCVE and WCVW. Central Virginia has included both of these channels in the cost estimates prepared by Horowitz Television Technology (HTT) and presented in this report in Chapter III. According to station staff, the programming on these two channels is distinct. A similar core of PBS programs are aired, but on differing schedules. In addition, the two stations' non-PBS programming serves separate audiences, with WCVW focusing more on adult learning while WCVE focuses more on youth during the day, according to staff.

In addition, Central Virginia operates two channels with similar coverage areas in the Northern Virginia area, WNVC and WNVT. Again, Central Virginia staff indicated to JLARC staff that while the same coverage area is served, the two stations are distinct in the populations they serve. Primarily, WNVC focuses on a large audience of individuals which do not speak English or for whom English is a second language. WNVT, on the other hand, is more of a typical public station with a strong emphasis on local programming.

These additional stations provide Central Virginia Public Television with the added capacity to address differing populations within their viewing areas. However, within the capabilities of the theorized digital technology is the ability to multicast four or more "channels" within the bandwidth allocated to one station. Thus it would be possible for one station to reach the distinct populations currently served by two. While the choice to retain or relinquish the broadcast licenses for each of these four stations is that of Central Virginia Public Television, the General Assembly may wish to consider disbursing any available conversion funds to only one of these stations in both areas. In terms of cost, as much as $15 million of the estimated conversion cost of $35.5 million for Central Virginia could be avoided by not converting WCVW and WNVT and relinquishing those licenses.

In additon to the two areas of coverage overlap by Virginia public stations discussed above, the Charlottesville area is also served by two public stations, WHTJ (part of Central Virginia Public Television) and WVPT (part of Shenandoah Valley Public Television). These two stations are typical public stations that air a core schedule of PBS children's shows and pass through the PBS primetime lineup in the evening. Both stations provide ITV services to school divisions in the Charlottesville area as well. WHTJ services the area through a main transmitter that essentially rebroadcasts the WCVE schedule out of Richmond. Central Virginia holds a separate broadcast license for WHTJ from the FCC. WVPT serves the Charlottesville area through a translator that passes through the broadcast that originates in Harrisonburg. Shenandoah Valley does not hold a separate FCC license as it is not required for the translator broadcast.

The extent to which this overlap produces higher than needed conversion costs for these two stations is unclear. The cost associated with converting a translator (not specifically broken out in Shenandoah Valley's conversion estimates) are significantly lower than that of converting a main transmitter (which Central Virginia estimates as $1.6 million for WHTJ). It is clear, however, that Central Virginia has the broader legal basis for continuing to provide broadcast service to that area as it holds the FCC license to do so. Shenandoah Valley personnel, on the other hand, indicated to JLARC staff that they rely heavily upon that area for private contributions (approximately 31 percent of their membership is from the area surrounding Charlottesville, compared to 19 percent for Central Virginia Public Television). Again, the General Assembly may wish to consider this situation as it pertains to the efficiency of service coverage and the distribution of State funds made available for the conversion. The Public Broadcasting Board appears to be the most relevant entity to further clarify the Charlottesville situation.

In addition to coverage overlap among the Virginia public stations themselves, there is a significant overlap in terms of population served in the Northern Virginia area between the two stations operated by Central Virginia Public Television (mentioned above) and the station operated by the Greater Washington Educational Telecommunications Association, WETA. WETA is currently available to some extent, either through broadcast or cable, in 27 Virginia localities. WETA estimates that approximately 36 percent of its total viewing is by Virginia citizens.

WETA has begun digitally broadcasting limited programming from an antenna in Virginia, and its offices and production facilities are also located in Virginia. If WETA's digital transmitter, which will eventually become its main transmitter, remains in Virginia, it appears that WETA would meet the current eligibility requirements for State CSG funding were the station to apply for inclusion before the Public Broadcasting Board. WETA does not provide ITV services to any Virginia school divisions, so even if it were considered eligible for State funding, it would not receive any ITV funds unless the station began providing those services. In terms of possible State funds earmarked for the digital conversion, WETA has already expended a considerable amount of money for the conversion, but still faces substantial costs in completing the conversion. If WETA were accepted by the Virginia Public Broadcasting Board as

eligible for State CSG funding, it would be inconsistent to exclude WETA from whatever State conversion funds are subsequently made available.

Many of the current Virginia public stations are concerned that inclusion of WETA in any of the current or possible future State funding sources would greatly diminish the appropriations that they would receive. However, others have pointed out that WETA is one of the highest regarded public stations in the country, and produces a large portion of the national PBS programming aired nationwide. Thus, the argument is made that Virginia may want to claim WETA as its own.

Currently, WNVT provides a distinct service to residents of Northern Virginia through the ITV program. Additionally, it has been argued that while WETA programming is primarily related to national affairs, WNVT and WNVC provide more focused local-interest programming. The added capacity that multicasting brings, however, could potentially free-up resources at WETA to refocus programming to other audiences, if WETA decides to do so. Even if WETA requests State funding through a formal application to the Public Broadcasting Board, it would be difficult to argue against including at least one of the Northern Virginia stations operated by Central Virginia Public Television in whatever State funding may be available for the conversion, since it would still be relied upon to provide ITV for the Northern Virginia school districts. If WETA were to be accepted by the Public Broadcasting Board as a Virginia station, and devoted station resources to the delivery of ITV services, the Public Broadcasting Board would need to examine the appropriateness of the State continuing to fund services that would be even more duplicative than they are currently. Nevertheless, the General Assembly should be aware of WETA's presence in Northern Virginia, and the possible implications of their inclusion in current and future State funding of public television.

The General Assembly may wish to consider the efficiency in coverage of public television in Virginia in determining how possible conversion funds are to be disbursed among the public stations. It is clear that some redundancy currently exists in the public television system, and that the use of State funds in perpetuating this redundancy should be scrutinized.

***Recommendation (7).*** **The Public Broadcasting Board should examine the necessity of two public television stations serving the same general geographical area in the Charlottesville region. The Public Broadcasting Board should report its recommendations on this issue to the Secretary of Administration and the General Assembly for consideration in both current and future State funding.**

***Recommendation (8).*** **If State funding is provided for the digital conversion of Virginia's public television stations, the General Assembly may wish to consider the efficiency of coverage of public television in disbursing State funds. The objective would be to help to ensure that State funds are used to promote and sustain a system that provides public television as cost-effectively as possible for Virginia citizens.**

***The Degree of Public Service Provided.*** The final criterion presented for consideration in the distribution of State funds made available for the digital conversion is the degree to which the public stations serve Virginia citizens. For this analysis, two primary factors for consideration are presented. The first factor is an indication of the potential that public television has to serve Virginia citizens, as illustrated by the number of children in kindergarten through 12th grade that have access to ITV programming from each of the public stations. The second factor is an indication of the potential number of Virginia citizens who may watch public television at each of the stations.

As mentioned in Chapter II of this report, ITV services provided by public television stations to the schools within their broadcast areas had the potential to reach approximately 1.1 million students during the 1998-1999 school year (based upon fall enrollment figures). Considering the fact that the majority of programming broadcast by the Virginia stations is acquired from outside producers (both for ITV and general use), the ITV program appears to be the major service provided to Virginia citizens that is truly unique to public television in Virginia, as programs are specifically aired to meet identified needs of local schools.

While the State already pays for the programming that is aired within the ITV program, that money does not fully support the necessary infrastructure to get the signal to the schools, especially given the current need on the part of the public stations to convert from analog to digital transmission. The number of school children served by each of the four public television corporations varies considerably. Table 8 presents

**Table 8**

## Potential ITV Population Served by the Public Stations

| Public Television Corporation | Potential Number of K-12 Students Served by ITV (1998-99 school year) |
|---|---|
| Blue Ridge Public TV | 178,923 |
| Central Virginia Public TV | 566,565 |
| Hampton Roads Public TV | 284,112 |
| Shenandoah Valley Public TV | 87,953 |
| **TOTAL** | **1,117,553** |

Notes: The potential number of students served is based upon fall enrollment figures for each of the localities in the Regional Schools Contracting and Planning Committees (RSCPCs) of the four corporations. In instances where RSCPC membership overlapped, the fall enrollment figure for those localities were divided equally among the relevant RSCPCs.

Source: JLARC staff analysis of Fall 1998 Enrollment data from the Virginia Department of Education, and of RSCPC membership provided by the public stations.

this breakdown based on localities served by each of the corporations and fall 1998 enrollment figures from those localities.

The population of elementary and secondary school students potentially served by the public television corporations is a measure of a significant public service available to the schools that can only continue in its current form if the stations convert to the digital infrastructure. Thus, as a policy choice, the General Assembly may wish to consider the number of students potentially served by each station through the ITV program in determining the distribution of any State funds made available for the digital conversion.

The second factor relating to the criterion of public service is an indication of the potential number of citizens who may watch public television. While it is clearly a subjective analysis to determine the public benefits attributable to public television, it is certainly possible to look at indications of the potential use of public television by Virginia citizens. JLARC staff attempted to use television ratings information for each of the public stations as the indicator of actual viewership of public television in Virginia. However, this analysis was somewhat limited due to the lack of consistent ratings information for some of the stations. Because of this limitation, JLARC staff used general population for each station's coverage area as a proxy for viewership. Table 9 presents each corporation's potential audience and the percentage of total Virginia population that the potential audience represents. Again, as a policy choice, this factor could be considered in disbursing available State funds for the conversion.

***Recommendation (9).*** **The General Assembly may wish to consider the level of service provided by the public stations to Virginia citizens in the disbursement of any State funds made available for the digital conversion. Specifically, the General Assembly could consider the ITV population served and the total viewership at each of the public stations.**

**Table 9**

## Potential Viewership of the Virginia Public Stations (1998)

| Public Television Corporation | Potential Audience | Percentage of Total Potential Audience |
|---|---|---|
| Blue Ridge Public TV | 1,137,450 | 17% |
| Central Virginia Public TV | 3,538,350 | 52% |
| Hampton Roads Public TV | 1,538,450 | 23% |
| Shenandoah Valley Public TV | 576,750 | 8% |
| **TOTAL** | **6,791,000** | **100%** |

Notes: Potential audience represents total population of the counties and cities within the coverage area of each of the stations within the corporation. In areas where coverage area overlaps, population was divided equally among the multiple stations serving that particular county or city.

Source: JLARC staff analysis of 1998 population data from the Weldon Cooper Center for Public Service.

## Illustrative Funding Formula Options

Based upon the above discussion of the three criteria that the General Assembly may wish to consider in distributing possible State funds for the digital conversion at the public stations, JLARC staff have developed a number of possible funding options that address how financial assistance from the State could be allocated. For illustrative purposes only, JLARC staff have assumed an overall State funding level for the conversion in each of the funding scenarios of one-third of the total estimated costs of the conversion. Depending on the factors considered, the illustrative State funding level ranges from approximately $19 million to $24 million. Funding for WETA is not included in the options for the reasons discussed in Chapter I (Appendix E contains a separate analysis including WETA, as requested by the Commission). The use of these funding amounts in no way indicates a recommended State funding level for the digital conversion.

The following illustrative funding options incorporate various measures of the three criteria presented above, as well as the proportional cost approach currently recommended by the Public Broadcasting Board. Each option is presented with a textual description followed by a table that applies the formula for each of the four public television corporations.

***Illustrative Option 1: Proportional Funding Based on the Costs of the Conversion.*** The approach to State funding of public television's digital conversion currently recommended by the Public Broadcasting Board is an allocation of available State funds at a level proportional to each station's total cost of the conversion. The Public Broadcasting Board has accepted the cost estimates presented in the Horowitz Television Technology (HTT) report as the basis for the proportional make-up of the total costs. The Board has recommended that the State fund one-half of the costs associated with the first two phases of the conversion (as defined in the HTT report). The Board intends to revisit State funding for the third phase after the completion of phases one and two. Under this recommendation, the stations would be allocated State funds at a level proportional to their percentage of the system-wide conversion costs. Table 10 presents the results of funding the conversion proportional to station costs, based upon a State funding level of $24 million.

The results of this funding formula option provide each corporation one-third of their estimated costs of the conversion, regardless of other factors that may impact the corporations' ability to finance the remaining costs of the conversion.

***Illustrative Option 2: Funding Based on Equity of Station Resources.*** As indicated above, two factors were considered by JLARC staff relating to the equity of station resources for the digital conversion. These are indications of the ability to leverage funding with current assets and the potential effort made to raise additional private contributions for the conversion. The ability to leverage funding with current assets is considered in this funding formula option by computing a multiplier based upon the relative proportion of the total difference in station assets and conversion costs exhibited

**Table 10**

## Illustrative Funding Option 1: Based on Proportion of Total Cost

**Assumed State Funding Level of: $24,000,000**

| Public Television Corporation | Estimated Cost of the Digital Conversion | Percent of Statewide Total Conversion Cost | Resulting State Funding Provided | Percent of Station Costs Met By State Funds |
|---|---|---|---|---|
| Blue Ridge Public TV | $13,448,290 | 19% | $4,499,053 | 33% |
| Central Virginia Public TV | 35,539,484 | 50% | 11,889,544 | 33% |
| Hampton Roads Public TV | 9,277,493 | 13% | 3,103,736 | 33% |
| Shenandoah Valley Public TV | 13,474,039 | 19% | 4,507,667 | 33% |
| **TOTAL** | **$71,739,306** | **100%** | **$24,000,000** | **33%** |

Notes: Percentage of total cost may not add to 100% due to rounding. Cost estimates utilized are those presented in *The Transition to Digital Television of Virginia's Public Television Stations*, by Horowitz Television Technology, June 14, 1999.

Source: JLARC staff analysis.

by the stations. The potential effort made to raise private contributions for the conversion is considered in this funding formula based upon a multiplier representing the relative proportion of total private funds that could have been raised in FY 1998 across the State assuming an equal base from which to draw those contributions. The calculations of these two multipliers are presented in Appendix D of this report. JLARC staff utilized these two measures of station equity of resources to compute a possible funding allocation method for State funds. The results of this computation are presented in Table 11 (page 56). The formula is based upon an equal distribution of the assumed available funding between the two factors ($12 million available for each factor).

The results of this funding formula option clearly provide the majority of the available State money to the public television corporations that have fewer current assets available to fund the conversion and that are making a greater proportional effort to raise private funds. This formula alone, however, does not consider other relevant factors in the decision of how to allocate State funds for the conversion.

***Illustrative Option 3: Funding Based on Efficiency in Service Coverage.*** The only quantifiable factor within the criterion of efficiency of service coverage is the number of transmitters needed to be converted to digital to potentially provide the same coverage of the State as is provided by the current analog system. For this funding option, JLARC staff reduced the number of transmitters to be converted from 11 to 9, eliminating one transmitter in Richmond (WCVW) and one in Northern Virginia (WNVT), as per the previous discussion. This reduces the total statewide conversion cost from $72 million to approximately $57 million. As a result, the assumed State funding level used in this analysis is approximately 19 million, or one-third of $57 million. Not addressed were the situations in the Charlottesville area and the situation with WETA, as these two issues need further clarification by the stations involved

**Table 11**

## Illustrative Funding Option 2: Based on Equity of Station Resources

**Assumed State Funding Level of: $24,000,000**

| Public Television Corporation | Ability to Leverage Funding ($12 million) Multiplier | Ability to Leverage Funding ($12 million) Resulting Funding | Effort Made to Raise Private Funds ($12 million) Multiplier | Effort Made to Raise Private Funds ($12 million) Resulting Funding | Total State Funding | Estimated Conversion Costs | % Met By State Funds |
|---|---|---|---|---|---|---|---|
| Blue Ridge Public TV | 40% | $4,807,941 | 22% | $2,621,228 | $7,429,169 | $13,448,290 | 55% |
| Central Virginia Public TV | 4% | 513,317 | 17% | 2,069,260 | 2,582,576 | 35,539,484 | 7% |
| Hampton Roads Public TV | 15% | 1,851,186 | 42% | 5,017,813 | 6,868,999 | 9,277,493 | 74% |
| Shenandoah Valley Public TV | 40% | 4,827,557 | 19% | 2,291,699 | 7,119,256 | 13,474,039 | 53% |
| **TOTAL** | **100%** | **$12,000,000** | **100%** | **$12,000,000** | **$24,000,000** | **$71,739,306** | **33%** |

Notes: Percentage of total cost may not add to 100% due to rounding. Cost estimates utilized are those presented in *The Transition to Digital Television of Virginia's Public Television Stations*, by Horowitz Television Technology, June 14, 1999. Multipliers shown in the table are rounded to the nearest whole percent, but the unrounded multipliers were used to calculate the resulting funding levels.

Source: JLARC staff analysis of station financial statements, of wage and salary data provided by the Virginia Employment Commission, and of personal income data provided by the United States Department of Commerce, Bureau of Economic Analysis.

and the Public Broadcasting Board. The resulting allocation of State funds based on efficiency in service coverage is presented in Table 12 (page 57).

The results of this funding option cover a much higher percentage of Blue Ridge's costs with State funds. This could help to alleviate the cost problems that Blue Ridge faces based on the large area and terrain that it currently covers. Hampton Roads, on the other hand, would receive the least proportional State funding through this option, as it only has one transmitter. Again, this formula alone does not consider other relevant factors in the decision of how to allocate State funds for the conversion.

***Illustrative Option 4: Funding Based on Public Service Provided.*** There were two quantifiable factors considered in this analysis that serve as an indication of the public service rendered by each of the public television corporations. These were the percentage of the population of students in kindergarten through 12$^{th}$ grade within the ITV service area of each of the corporations, and the potential viewing audience of each of the public stations. JLARC staff utilized these two measures of potential public service provided to compute a possible funding allocation method for State funds. The

**Table 12**

## Illustrative Funding Option 3: Based on Efficiency of Service Coverage

**Assumed State Funding Level of: $18,912,929**

| Public Television Corporations | Number of Transmitters For State Funding | Funding Based Upon a Per Transmitter Amount | Estimated Conversion Costs | Percent of Costs Met By State Funds |
|---|---|---|---|---|
| Blue Ridge Public TV | 3 | $6,304,310 | $13,448,290 | 47% |
| Central Virginia Public TV | 3 | 6,304,310 | 20,538,965 | 31% |
| Hampton Roads Public TV | 1 | 2,101,437 | 9,277,493 | 23% |
| Shenandoah Valley Public TV | 2 | 4,202,873 | 13,474,039 | 31% |
| **TOTAL** | **9** | **$18,912,929** | **$56,738,787** | **33%** |

Notes: Cost estimates utilized are those presented in *The Transition to Digital Television of Virginia's Public Television Stations*, by Horowitz Television Technology, June 14, 1999. The number of transmitters for Central Virginia Public TV is reduced by two as per the discussion above. Thus, estimated conversion costs for Central Virginia Public TV exclude those costs associated with the conversion of WCVW in Richmond and WNVT in Northern Virginia. The assumed State funding level is one-third of the resulting statewide total costs with the two mentioned stations excluded.

Source: JLARC staff analysis.

results of this computation are presented in Table 13 (page 58). The formula is based on an equal distribution of the assumed available funding between the two factors ($12 million available for each factor).

As indicated in Table 13, funding based on public service provided alone results in significant differences in the proportion of each corporation's total conversion cost met by State funds. For Shenandoah Valley Public Television, for example, the resulting State funds would only cover 15 percent of the total conversion costs. As with the other options previously discussed, this formula alone does not consider other relevant factors in the decision of how to allocate State funds for the conversion.

***Illustrative Option 5: Funding Based on a Combination of Factors Related to Equity, Efficiency, and Public Service.*** The final funding option presented by JLARC staff in Table 14 (page 59) is a formula that combines factors relating to the three criteria discussed above as equal parts of the allocation. Because this option includes the factor relating to efficiency of coverage, the funding example is based upon a total cost of approximately $57 million (excluding two of Central Virginia Public Television's stations). As such, the assumed State funding level is approximately $19 million (one-third of $57 million). Under the formula presented, each criterion carries one-third (or $6.3 million) of this assumed State funding level. It should be noted that the amount of the total available funds allocated to each of the three criteria could be adjusted if arguments were presented to weigh one factor more than another. Within the specific criteria, the $6.3 million is divided equally among the factors considered where necessary.

**Table 13**

## Illustrative Funding Option 4: Based on Public Service Provided

**Assumed State Funding Level of: $24,000,000**

| Public Television Corporation | Potential ITV Population Served ($12 million) | | Percent of Potential Viewers ($12 million) | | Total State Funding | Estimated Conversion Costs | % Met By State Funds |
|---|---|---|---|---|---|---|---|
| | Percent of Total Served | Resulting Funding | Percent of Total Served | Resulting Funding | | | |
| Blue Ridge Public TV | 16% | $1,921,230 | 17% | $2,009,925 | $3,931,155 | $13,448,290 | 29% |
| Central Virginia Public TV | 51% | 6,083,631 | 52% | 6,252,422 | 12,336,053 | 35,539,484 | 35% |
| Hampton Roads Public TV | 25% | 3,050,722 | 23% | 2,718,510 | 5,769,232 | 9,277,493 | 62% |
| Shenandoah Valley Public TV | 8% | 944,417 | 8% | 1,019,143 | 1,963,560 | 13,474,039 | 15% |
| **TOTAL** | **100%** | **$12,000,000** | **100%** | **$12,000,000** | **$24,000,000** | **$71,739,306** | **33%** |

Notes: Percentage of total cost may not add to 100% due to rounding. Cost estimates utilized are those presented in *The Transition to Digital Television of Virginia's Public Television Stations*, by Horowitz Television Technology, June 14, 1999.

Source: JLARC staff analysis of locality fall 1998 K-12 enrollment data provided by the Virginia Department of Education, and 1998 population data provided by the Weldon Cooper Center for Public Service.

The multipliers used in the calculation of this funding option are based upon the same methodologies developed for each of the above criterion-specific formulae.

As shown in Table 14, the combination of factors related to resource equity, coverage efficiency, and provision of public service results in a distribution of funding very different for the four public television corporations. Under this scenario, Hampton Roads and Blue Ridge would meet a much higher proportion of their conversion costs with State funds than would the other two corporations. Shenandoah Valley would receive slightly less under this scenario than they would under the scenario related to the proportion of total costs (Option 1), but this is because the assumed State funding level is less in Option 5 ($19 million compared to $24 million). Central Virginia would also receive less in terms of the amount of estimated costs covered by State funds in this scenario, but it is clear that this corporation has significantly more financial resources than the other corporations.

***Recommendation (10).*** **If State funds are made available to the Virginia public television stations for the digital conversion, the General Assembly may wish to consider a combination of factors relating to the equity of station resources, the efficiency of public television coverage, and the public service provided to Virginia citizens by public television in allocating those State funds to the individual stations.**

**Table 14**

# Illustrative Funding Option 5: Based on a Combination of the Criteria of Equity of Station Resources, Efficiency of Service Coverage, and Degree of Public Service

**Assumed State Funding Level of: $18,912,929**

| Public Television Corporations | Equity of Station Resources (33% of Available Funds) | | Efficiency of Service Delivery (33% of Available Funds) | Degree of Public Service (33% of Available Funds) | | Total State Funding | Estimated Conversion Costs | % of Costs Met by State Funds |
|---|---|---|---|---|---|---|---|---|
| | Funding Related To Ability to Leverage Funds (50%) | Funding Related To Effort to Raise Private Funds (50%) | Funding Related To Number of Transmitters | Funding Related To Potential ITV Population | Funding Related To Potential Population Served | | | |
| Blue Ridge Public TV | $1,262,948 | $688,543 | $2,101,437 | $504,668 | $527,966 | $5,085,561 | $13,448,290 | 38% |
| Central Virginia Public TV | 134,838 | 543,552 | 2,101,437 | 1,598,046 | 1,642,384 | 6,020,256 | 20,538,965 | 29% |
| Hampton Roads Public TV | 486,269 | 1,318,077 | 700,479 | 801,362 | 714,097 | 4,020,284 | 9,277,493 | 43% |
| Shenandoah Valley Public TV | 1,268,100 | 601,983 | 1,400,958 | 248,079 | 267,708 | 3,786,828 | 13,474,039 | 28% |
| **TOTAL** | **$3,152,155** | **$3,152,155** | **$6,304,310** | **$3,152,155** | **$3,152,155** | **$18,912,929** | **$56,738,787** | **33%** |

Notes: Funding presented for each column corresponds to the discussion of the individual formulas for each of the three criteria presented previously in this report. JLARC staff assumed one-third of the total illustrative funding amount would be available for each criteria within this combined formula. Cost estimates utilized are those presented in The *Transition to Digital Television of Virginia's Public Television Stations*, by Horowitz Television Technology, June 14, 1999. The number of transmitters for Central Virginia Public TV is reduced by two as per the discussion above. Thus, estimated conversion costs for Central Virginia Public TV exclude those costs associated with the conversion of WCVW in Richmond and WNVT in Northern Virginia. The assumed State funding level is one-third of the resulting statewide total costs with the two mentioned stations excluded.

Source: JLARC staff analysis of station financial statements, wage and salary data provided by the Virginia Employment Commission, personal income data provided by the United States Department of Commerce, Bureau of Economic Analysis, locality fall 1998 K-12 enrollment data provided by the Virginia Department of Education, and 1998 population data provided by the Weldon Cooper Center for Public Service.

# Appendixes

## Appendix A

# Study Mandate

### ITEM 16F - 1999 APPROPRIATION ACT

### PUBLIC BROADCASTING STATIONS

The Joint Legislative Audit and Review Commission shall study: 1) the implications of the Federal Communication Commission's requirement that Public Broadcasting Stations begin digital transmission of television programs in the year 2003, with special regard for programming implications; and 2) the use of existing funding from the Commonwealth by Virginia stations receiving Community Service Grants from the Commonwealth. In conducting its study, the Commission may consult with Virginia Public Broadcasting Stations, the Virginia Public Telecommunications Board, and such other agencies or institutions as may seem appropriate.

## Appendix B

# CSG-Funded Public Television Programs
### (Calendar Year 1998)

## EDUCATIONAL

- Ready to Learn (all stations)
- Ready to Learn parent and caregiver workshops (WHRO, WBRA, WCVE, WVPT)
- Ready to Learn support materials (Mailings to 1,800 addresses) (WHRO)
- Ready to Learn support materials (1,000 mailings per month) (WCVE)
- Ready to Learn workshops (48), reaching 3,118 children, 588 professionals, 594 parents, 73% of at-risk students tested scored higher than anticipated on pre-school screenings (WVPT)
- Ready to Learn book distribution First Books and matching books, 8,112 (WVPT)
- Ready to Learn bookbags (750 bags), 350 yards of fabric donated, 1200 volunteer hours (WVPT)
- Ready to Learn Migrant Education distribution of Spanish materials and books, 40 families (WVPT)
- Ready to Learn Community Story Time Project, Barney and Friends grant from Lyric, Corporation (8 elementary schools, 210 children, 40 parents) (WVPT)
- Ready to Learn intergenerational modeling project, NODDY grant (20 at-risk families mentored by retirement community volunteers, parenting guides, books, training and materials provided) (WVPT)
- Ready to Learn distribution of 300 Watch, Play and Learn, Barney and Friends Guides with instruction (WVPT)
- Ready to Learn distribution PBS Families Magazines, 1,200 English, 400 Spanish (WVPT)

- Ready to Learn participation in First Night Celebration, Title I Fairs, School Spring Fling, Child Care Conferences, Virginia State Reading Conference, Head Start Conference (support and promotional items distributed and mailed, 15,000) (WVPT)

- Ready to Learn workshop, certification hours for child care providers (WVPT)

- Ready to Learn video (9 minutes, informational) (WVPT)

- First Book (WBRA, WCVE, WHRO, WVPT)

- Consortium for Interactive Instruction (15 public school divisions & 12 independent schools) (WHRO)

- Hands-on computer workshops (115 workshops) (WHRO)

- Graduate Education Courses (36 courses offered) (WHRO)

- Interactive Dimensions newsletter (25,000 copies each issue, 3X annually) (WHRO)

- Learning Link on line educational materials (WHRO)

- Reading Rainbow Young Writers and Illustrators Contest (WCVE, WHRO, WBRA, WVPT)

- Reading Rainbow Contest Promotional Spot (WCVE)

- WHRO Education Services Guide (25,000 copies) (WHRO)

- Teacher Link newsletter (monthly mailing to 400 schools) (WHRO)

- Technology in Education Conference (Internet Academy 800 participants) (WHRO)

- The Great Computer Challenge (330 teams) (WHRO)

- Education Connection On-line Curriculum Development (Economics On-line, 60 days of instruction/Art, Music & Language Arts, 60 days of instruction) (WHRO)

- Tech Trek (Technology camp for teachers) (WHRO)

- Techfest (Educational Technology Conference-780 participants) (WCVE)

- VCR Seminar (75 teachers attended) (WHRO)
- NTTI Institutes (65 teachers attended) (WHRO)
- NTTI (250 teachers trained) (WCVE)
- College credit telecourses broadcast (WVPT)
- Nova teacher's guides distributed to schools (WVPT)
- Bill Nye teacher's guides distributed to schools (WVPT)
- Magic School Bus teacher's guides distributed to schools (WVPT)
- Frontline teacher's guides distributed to schools (WVPT)
- Life by the Numbers guides distributed to schools (WVPT)
- Newton's Apple teacher's guides distributed to schools (WVPT)
- A Science Odyssey posters distributed to schools (WVPT)
- American Experience posters distributed to schools (WVPT)
- Sesame Street PEP (12 workshops) (WCVE)
- Young Heroes - For the eighth year, WVPT recognized ten outstanding youngsters from grades K-12 in the WVPT viewing area who excelled in academics, athletics, community involvement or those who overcame a handicapping situation.
- Young Environmentalist Award - WVPT partnered with Shenandoah Spring Water in Staunton, Virginia to recognize youth in grades K-12 who demonstrate an understanding of water preservation and conservation issues and who offer solutions to reverse environmental decline.
- Mr. Rogers' Sweater Project - WVPT partnered with United Way offices and their member agencies in the WVPT viewing area to collect "gently worn" sweaters (all sizes) and children's sweatshirts to distribute them free to neighbors in need.
- 1998 Outreach Report - "Moyers on Addiction" Viewfinder program guide article, print ads in four major newspapers, NPR PSAs (WVPT)
- "Mr. Rogers' Neighborhood" & entire children's schedule Newsletter & broadcast schedule to daycare facilities, libraries (WVPT)

- Wishbone Reader of the Pack Read-a-Thon. This is our fourth year doing it. The project is designed to promote a daily love of reading. We target first graders in elementary school. (WNVT)

- Bill Nye " Way Cool " Science Experiment. This community outreach project challenges seventh grade students to explore how advertising effects nutrition. The students produce their own promo demonstrating this. (WNVT)

- *This Week in Hampton Roads* - Public Education Funding (produced by WHRO)

- *Surviving Hatred: Witness to the Holocaust* (produced by WHRO, includes SOL-correlated teacher guide)

- *Best Practices* (2/30's) (produced by WHRO)

- *NetFiles* (9 monthly programs/carried nationally) (produced by WHRO)

- *School Talk* (38 weekly programs) (produced by WHRO)

- Mr. Rogers Sweater Drive (600 sweaters collected) (WHRO)

- *Our Inspiration: The Story of Maggie Lena Walker* (1/60) (produced by WCVE)

- *Challenge 23* (17/60's & 5/30's) (produced by WCVE)

- *Reclaiming Lives: Addiction and Recovery in Central Virginia* (1/60) (local follow-up to Moyers on Addiction) (produced by WCVE)

- Ready to Learn video overview of service for users (produced by WVPT)

- *Living in Virginia: Alpacas* – Everything you wanted to know about this amazing animal that provides food, fuel, clothing and transportation to some Valley residents (produced by WVPT)

- *Living in Virginia: Breast Cancer* – Information on new support groups and resources available to victims and their families (produced by WVPT)

- *Consider This: Linwood Rose* – James Madison University's new president discussed future plans (produced by WVPT)

- *Consider This: Philip Stone* – The President of Bridgewater College discussed future plans for the college (produced by WVPT)

- *TaxBreak '98* (produced by WVPT)
- *Forum Romanum* (produced by WNVT)
- *Sesame Street* (WBRA, WCVE, WHRO, WVPT, WNVT)
- *Arthur* (WBRA, WCVE, WHRO, WVPT, WNVT)
- *Bill Nye the Science Guy* (WBRA, WCVE, WHRO, WVPT, WNVT)
- *Puzzle Place* (WBRA, WCVE, WHRO, WVPT)
- *Kratt's Creatures* (WBRA, WCVE, WHRO, WVPT, WNVT)
- *Mister Rogers' Neighborhood* (WBRA, WCVE, WHRO, WVPT, WNVT)
- *Reading Rainbow* (WBRA, WCVE, WHRO, WVPT)
- *Wishbone* (WBRA, WCVE, WHRO, WVPT, WNVT)
- *Teletubbies* (WBRA, WCVE, WHRO, WVPT, WNVT)
- *Noddy* (WBRA, WCVE, WHRO, WVPT)
- *Barney & Friends* (WBRA, WCVE, WHRO, WVPT, WNVT)
- *Theodore Tugboat* (WBRA, WCVE, WHRO, WVPT, WNVT)
- *Zoom* (WBRA, WCVE, WHRO, WVPT, WNVT)
- *Big Comfy Couch* (WBRA, WCVE, WVPT, WNVT)
- *Wimzie's House* (WBRA, WCVE, WVPT, WNVT)
- *Kidsongs* (WHRO)
- *Charlie Horse Music Pizza* (WHRO)
- *Africans in America* (WBRA, WCVE, WHRO, WVPT, WNVT)
- *American Experience* (WBRA, WCVE, WHRO, WVPT)
- *David Attenborough's Natural World* (WBRA, WCVE, WHRO, WVPT, WNVT)

- *Eyewitness* (WBRA, WCVE, WHRO, WVPT, WNVT)
- *Frank Lloyd Wright* (WBRA, WCVE, WHRO, WVPT)
- *Frontline* (WBRA, WCVE, WHRO, WVPT)
- *India: Land of the Tiger, A "Nature" Miniseries* (WBRA, WCVE, WHRO, WVPT,WNVT)
- *Living Edens* (WBRA, WCVE, WHRO, WVPT)
- *Moyers on Addiction: Close to Home* (WBRA, WCVE, WHRO, WVPT, WNVT)
- *Nature* (WBRA, WCVE, WHRO, WVPT, WNVT)
- *Newshour with Jim Lehrer* (WBRA, WCVE, WHRO, WVPT)
- *Nova* (WBRA, WCVE, WHRO, WVPT, WNVT)
- *Scientific American Frontiers* (WBRA, WCVE, WHRO, WVPT)

**POLITICAL**

- *Candidate's Forum: 1998* (produced by WVPT)
- *Consider This: Mayor Rodney Eagle* – Harrisonburg's Mayor discusses past accomplishments and future plans for the city (produced by WVPT)
- *Candidate Minutes* – Congressional candidates were invited to tape one minute messages for voters, airing the six weeks prior to elections (produced by WVPT)
- *Virginia Legislative Review* (8/30's) (produced by WBRA)
- *From Our Archives: "Mills Godwin & Albertis Harrison"* (13/30's) (produced by WCVE)
- *Governor Allen's State of the Commonwealth* (1/60) (produced by WCVE)(aired by all stations)
- *Governor Gilmore's Inauguration* (1/3 1/2 hr) (co-produced by WCVE/WNVT)(aired by all stations)

- *Governor Gilmore's State of the Commonwealth* (1/60) (produced by WCVE) (aired by all stations)

- *This Week in Hampton Roads* (6 editions of this weekly series) – Sample of topics: General Assembly (3 programs), Civic Activism and politics, Congress and Ballot Issues. (produced by WHRO)

- *Election 98* – House of Representatives elections; ballot initiatives (produced by WHRO)

- *Virginia Capitol Events* (produced by WNVT) (aired by all stations)

- *Around the Rappahannock* (produced by WNVT)

**PUBLIC AFFAIRS**

- *The Coming Crisis in Social Security* (1/60 & 1/30) (produced by WBRA)

- *Blue Ridge Nightline* (26/30's) (produced by WBRA)

- *At Issue with Bob Denton* (31/30) (produced by WBRA)

- *Richmond City Council* (26 various) (produced by WCVE)

- *For the Record with Charley McDowell* (10/30's) (produced by WCVE)

- *Richmond: More Than Meets the Eye* (1/60) (produced by WCVE)

- *Justice on Trial "Domestic Violence: Mandatory Arrest"* (1/60) (produced by WCVE)

- *This Week in Hampton Roads* (15 episodes of weekly series) (Topics include: defense, guns and kids, managed healthcare, regional transportation, hurricane safety) (produced by WHRO)

- *Heavy Traffic* (1/60) (documentary profiling the transportation history, design and plans in Hampton Roads) (aired statewide produced by WHRO)

- *Hampton Roads: What's In It for Me?* (Regional transportation planning) (produced by WHRO)

- *Flag Man – School Talk* (produced by WHRO)

- *Consider This: Battlefield Preservation* (John Heatwole and Howard Kittell discussed plans to preserve local battlefields) (produced by WVPT)

- *Living in Virginia: The War Over Battlefields* (preservationists are clashing with developers over what will become of our historic battlegrounds in Virginia) (produced by WVPT)

- *Living in Virginia: Zero Tolerance* (the new legislation requires police to make an arrest whenever there is probable cause) (produced by WVPT)

- *Living in Virginia: The Organic Dilemma* (is the FDA ignoring USDA standards for organic production?) (produced by WVPT)

- *Living in Virginia: Domestic Violence* (a close look at area trends and resources) (produced by WVPT)

- *Living in Virginia: Medicine's Deadly Dust* (1.3 million individuals are threatened by latex allergies, which can be fatal) (produced by WVPT)

- *Living in Virginia: Addiction, Close to Home* – a thirty-minute local follow-up to the national Moyers on Addiction series (produced by WVPT)

- *Living in Virginia: The Iris Still Blooms* – the story of the mountain people displaced to build the Shenandoah National Park (produced by WVPT)

**COMMUNITY and/or CULTURAL**

- *Living in Virginia: Artists in Cahoots* – Artists living and working together in Lexington, Virginia (produced by WVPT)

- *Living in Virginia: T'ai Chi* – Charlottesville residents have a growing interest in this ancient art (produced by WVPT)

- *Short Takes* – Short videos on 24 local service agencies (produced by WVPT)

- *Living in Virginia: Century Farms* – The Virginia Department of Agriculture recognized 144 area farms. A few Valley farms are celebrated in the 30-minute special (produced by WVPT)

- *Living in Virginia: Roots* – The story of the ARC, the Association of Retarded Citizens and services provided (produced by WVPT)

- *Living in Virginia: The Birds* – Bonnie Hohn of Staunton is a "bird therapist" who builds her life around helping handicapped cockatoos and parrots (produced by WVPT)

- *Living in Virginia: Ballroom* – Suddenly, Virginia is being swept away by a new love of an old hobby – ballroom dancing (produced by WVPT)

- *WVPT Cooks* – three two and one-half hour shows highlighting local chefs and cuisine (produced by WVPT)

- *Young Heroes* – Videos on WVPT's Young Heroes contest winners (produced by WVPT)

- *This Week in Hampton Roads* (5 editions of this weekly series) Sample topics: Race Relations, Slavery, Indians in Hampton Roads (produced by WHRO)

- Colors All Our Own – continuing outreach project on race relations in Hampton Roads (WHRO)

- *Exodus* – a series of short programs that tell the story of the ship, Exodus, and its role in the founding of the State of Israel (produced by WHRO)

- *Regent University Film Festival* (5-part series) (WHRO)

- *School Talk* (WHRO)

- *The Melungeons on Blue Ridge Nightline* (produced by WBRA)

- *Moyers on Addiction* with local cut aways (produced by WBRA)

- *Virginia Currents* (52/30) (produced by WCVE)

- *Sports Talk* (produced by WNVT)

- *Medical Answers* (produced by WNVT)

- *Make Peace with Nature* (produced by WNVT)

- *America's Army* (produced by WNVT)

- *Mat-Time* (produced by WNVT)

**TOURISM/ECONOMIC DEVELOPMENT**

- *Thomas Jefferson's Poplar Forest* (produced by WBRA)

- *Forgotten Battleground: The Civil War in SW. Virginia* (produced by WBRA)

- *Virginia Currents* (52/30) (produced by WCVE)

- *Consider This: Bill O'Brien* – The Rockingham County Administrator discussed plans for the future (Produced by WVPT)

- *Living in Virginia: Urban Sprawl* – Augusta County residents are worried about a proposed subdivision on 135 acres of farmland (produced by WVPT)

- *Consider this: Carter Melton* – The CEO of Rockingham Memorial Hospital discussed plans for expansion and new services (produced by WVPT)

- *Staunton Looks Back: Streetcars to Cobblestones* (produced by WVPT)

- *Winchester: Pen in Hand* (produced by WVPT)

- *Living in Virginia: A Family A Fair* – the 50th Anniversary of the Rockingham County Fair (produced by WVPT)

- *This Week in Hampton Roads* (7 editions of this weekly series) Sample topics: regional growth pros and cons, eco tourism, community development banks, light rail development (produced by WHRO)

- *400 Years Since Jamestown* – Preparing for 2007 – a series of short programs that reflect the thinking of distinguished older Virginians about the future as it relates to the past (produced by WHRO)

- Virginia International Waterfront Arts Festival – participation in promotion, publicity, programming (WHRO)

- *School Talk* – Mid-Summer Nights Dream (produced by WHRO)

## Appendix C

# Digital Conversion Cost Details
### (as found in the Horowitz Television Technology Report)

## EXPLANATION OF SYMBOLS

### Letters preceding Dollar Entries

Dollar entries are preceded with a lower case letter.

An upper case letter is the sum of all the matching lower case letters. For example, B is the sum of all the b's.

For clarity, the following letter symbols are not used: iI, jJ, lL, oO, xX

### Abbreviations

HVAC = Heating, ventilation, and air conditioning

incl = Included (typically used to show an item's cost is included in another amount in the column – rounded)

KW = Kilowatts

N/A = Not applicable or not required

OOC = Out of core channel assignment

Req'd = Required

S.I. = Systems integration

### Notes

* An asterisk indicates the funds have already been expended.

(1) Portion of RF Combiner in lieu of separate antenna

(2) WHRO is negotiating scenarios that will result in no cost to the station for its tower.

(3) Includes equipment item at General Assembly building.

# VIRGINIA PUBLIC TELEVISION STATIONS

## Conversion to Digitlal Television - Cost Estimate

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Licensing Entity | Blue Ridge Public Television, Inc. | | | Central Virginia Educational Telecommunications Corporation | | | | | Hampton Roads Educational Telecommunications Association, Inc | Shenandoah Valley Educational Television Corporation | |
| | Organization Abbreviation | BRPTV | | | CVETC | | | | | HRETA | SVETC | |
| | City | Roanoke | Marion | Norton | Richmond | Richmond | Charlottesville | Fairfax | Goldvein | Hampton Norfolk | Harrisonburg Staunton | Front Royal |
| | Call Letters | WBRA-TV | WMSY-TV | WSBN-TV | WCVE-TV | WCVW-TV | WHTJ-TV | WNVC-TV | WNVT-TV | WHRO-TV | WVPT | WVPY |
| General | NTSC Channel | 15 | 52 | 47 | 23 | 57 | 41 | 56 | 53 | 15 | 51 | 42 |
| | | | | | | | | | | | | |
| | DTV Call Letters | WBRA-DT | WMSY-DT | WSBN-TV | | | | | | WHRO-DT | | |
| | DTV Channel | 3 | 42 | 32 | 24 | 44 | 14 | 57 | 30 | 16 | 11 | 21 |
| | DTV Power (kilowatts) | 7.25 | 100 | 100 | 108.8 | 50 | 50 | 50 | 50 | 200 | 3.2 | 50 |
| | Antenna Height (meters) Above Average Terrain (HAAT) | 634 | 445 | 591 | 327 | 293 | 352 | 215 | 229 | 294 | 680 | 398 |
| | | | | | | | | | | | | |
| | Has Station applied for Constr Permit? | Yes | Yes | Yes | No, planned for October 1999 | | | | | Yes | No, planned for 2000 | |
| | Constr Permit Granted | | | | | | | | | | | |
| | Applied for FCC License | | | | | | | | | | | |
| | FCC License Granted | | | | | | | | | | | |
| 1 | | | | | | | | | | | | |
| | **Phase 1 (Basic Transmission)** | | | | | | | | | | | |
| Tower | Tower Status | New Tower will likely be required, possible that old WMSY-TV tower could be relocated here and reused. No analysis ordered | SERIOUS PROBLEM, Existing tower cannot be modified for DTV antenna, no analysis ordered | Existing tower may not be capable of supporting DTV antenna, no analysis ordered | Tower will accommodate DTV antenna as per station, analysis ordered. Tower modification to be accomplished by WRIC-TV, local ABC affiliate | Tower will accommodate DTV antenna as per station, analysis ordered. Tower modification to be accomplished by WRIC-TV, local ABC affiliate | Tower will accommodate DTV antenna as per station, analysis ordered. | Tower will accommodate DTV antenna as per station, analysis completed. | Tower will accommodate DTV antenna as per station, analysis to be ordered in Spring 99. | Could accommodate WHRO NTSC & DTV antennas if two commercial stations relocate. New tower also under study. | Tower will accommodate DTV antenna as per station, no analysis ordered | Tower will accommodate DTV antenna as per station, no analysis ordered |
| | Tower Analysis Est/Cost | a $ 12,000 | a $ 12,000 | a $ 12,000 | a N/A | a N/A | a $ 12,000 | a $10,700* | a $ 12,000 | a $8,500* | a N/A | a N/A |
| | Tower (Mod.or New) Est. | a $ 350,000 | a $ 350,000 | a $ 350,000 | a $ 30,627 | a $ 30,627 | a $ 80,000 | a $255,700* | a | a (2) | a N/A | a N/A |
| | Tower Total | A $ 362,000 | A $ 362,000 | A $ 362,000 | A $ 30,627 | A $ 30,627 | A $ 92,000 | A $ - | A $ 12,000 | A $ - | A $ - | A $ - |
| | | | | | | | | | | | | |
| Trans & Ant. | DTV Antenna | b $ 108,110 | b $ 55,500 | b $ 55,500 | b(1) $ 125,000 | b $ 150,000 | b $ 75,000 | b $ 162,490 | b $ 29,500 | b $ 194,900 | b $ 15,000 | b $ 32,000 |
| | Transmission Line | b $ 15,750 | b $ 38,500 | b $ 38,500 | b $ 12,500 | b $ 12,500 | b $ 18,000 | b $ 66,730 | b $ 38,250 | b $ 152,210 | b $ 10,000 | b $ 8,400 |
| | Antenna Installation | b $ 65,000 | b $ 65,000 | b $ 65,000 | b N/A | b N/A | b | b $ 103,320 | b $ 28,620 | b $ 65,000 | b | b |
| | Out of Core (OOC) Antenna Replacement | N/A | N/A | N/A | N/A | N/A | N/A | Required | N/A | N/A | N/A | N/A |
| | OOC Antenna Cost | N/A | N/A | N/A | N/A | N/A | N/A | b $ 156,576 | N/A | N/A | N/A | N/A |
| | OOC Transmission Line | N/A | N/A | N/A | N/A | N/A | N/A | Included in $157k | N/A | N/A | N/A | N/A |

| | Organization Abbreviation | BRPTV | | | CVETC | | | | | HRETA | SVETC | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | City | Roanoke | Marion | Norton | Richmond | Richmond | Charlottesville | Fairfax | Goldvein | Hampton Norfolk | Harrisonburg Staunton | Front Royal |
| | Call Letters | WBRA-TV | WMSY-TV | WSBN-TV | WCVE-TV | WCVW-TV | WHTJ-TV | WNVC-TV | WNVT-TV | WHRO-TV | WVPT | WVPY |
| Transmitter & Ant. Cont'd | OOC Antenna Installation | N/A | N/A | N/A | N/A | N/A | N/A | Included in $157k | N/A | N/A | N/A | N/A |
| | Transmitter Avg Power | 5 kW | 10 kW | 10 kW | 25 kW | 10 kW | 1 kW | 10kW | 10kW | 21kW | 2.5kW | 5kW |
| | Transmitter quote | b $ 390,900 | b $ 648,000 | b $ 648,000 | b $ 718,300 | b $ 709,300 | b $ 536,500 | b $ 648,000 | b $ 648,000 | b $ 451,375 | b $ 261,900 | b $ 368,000 |
| | Remote Control | b $ 23,967 | b $ 23,967 | b $ 23,967 | N/A | N/A | b $ 25,000 | N/A | b $ 12,000 | N/A | b $ 25,000 | b $ 25,000 |
| | Monitoring Package | b $ 128,270 | b $ 128,270 | b $ 128,270 | b $ 138,000 | b $ 138,000 | b $ 138,000 | b $ 127,780 | b $ 127,780 | b $ 126,850 | b $ 130,930 | b $ 130,930 |
| | HDTV Waveform Monitor | b $ 15,000 | b $ 15,000 | b $ 15,000 | b $ 15,000 | b N/A | b $ 15,000 | b $ 15,000 | b $ 15,000 | b $ 15,000 | b $ 15,000 | b $ 15,000 |
| | Spare Exciter | b $ 63,540 | b $ 70,500 | b $ 70,500 | b $ 70,500 | b $ 70,500 | b $ 70,500 | b N/A | b N/A | b $ 70,500 | b $ 63,540 | b $ 70,500 |
| | DTV Bandpass Filter | b $ 35,700 | b $ 23,300 | b $ 23,300 | b N/A | b N/A | b $ 23,000 | b $ 23,300 | b $ 23,300 | b incl in $451k | b $ 25,385 | b $ 23,300 |
| | Voltage Regulator | b $ 18,520 | b $ 18,520 | b $ 18,520 | b N/A | b N/A | b $ 14,000 | b N/A | b N/A | b $ 22,465 | b N/A | b N/A |
| | Installation, Test & Training | b $ 26,977 | b $ 34,761 | b $ 34,761 | b $ 35,000 | b $ 35,000 | b $ 35,000 | b $ 34,761 | b $ 34,761 | b $ 53,698 | b $ 22,854 | b $ 30,627 |
| | Miscellaneous components | b $ 10,942 | b $ 23,039 | b $ 23,039 | b $ 15,000 | b $ 15,000 | b $ 15,000 | b $ 42,194 | b $ 25,094 | b $ 19,795 | b $ 9,302 | b $ 18,771 |
| | Freight (1%) | b $ 6,800 | b $ 7,500 | b $ 7,500 | b $ 11,000 | b $ 11,000 | b $ 10,000 | b $ 14,000 | b $ 10,000 | b $ 11,000 | b $ 5,800 | b $ 7,200 |
| | Transmitter & Antenna Total | B $ 909,476 | B $ 1,151,857 | B $ 1,151,857 | B $ 1,140,300 | B $ 1,141,300 | B $ 975,000 | B $ 1,394,151 | B $ 992,305 | B $ 1,182,793 | B $ 584,711 | B $ 729,728 |
| Transm Bldg | Transmitter Bldg space | Adequate | Adequate | Adequate | Adequate | Adequate | Adequate | Adequate | Adequate | Modification req'd | Adequate | Adequate |
| | AC Power Supply | Adequate | | | Adequate | Adequate | Adequate | Adequate | Adequate | Modification req'd | Need Upgrade | Need Upgrade |
| | Heating, Ventilating, and Air Conditioning | Emergency heating system required | Power System will likely need modification | Power System will likely need modification | Adequate | Will require minor work | Will require major work | Adequate | Adequate | Additional HVAC required | Need Upgrade | Need Upgrade |
| | Total Bldg modification Est. | C $ 10,000 | C $ 20,000 | C $ 20,000 | C $ 25,000 | C N/A | C $ 75,000 | C $ 25,000 | C $ 1,000 | C $ 150,000 | C $ 69,000 | C $ 54,000 |
| Microwave | Is Transmitter co-located with Studio | No | No | No | Yes | Yes | No | Yes | No | Nc | No | No |
| | Microwave | d $ 484,365 | d $ 152,250 | d $ 456,750 | d N/A | d N/A | d $ 98,000 | d N/A | d $ 192,000 | d $ 158,500 | d $ 505,789 | d $ 186,000 |
| | DTV/NTSC DS3 Codecs or other dual feed technology | d incl in 484k | d incl in 304k | d incl in 304k | d N/A | d N/A | d $ 25,000 | d N/A | d $ 25,000 | d incl in 158k | d incl in 505k | d incl in 186k |
| | Towers | d $ 150,000 | d N/A | d N/A | d N/A | d N/A | d N/A | d N/A | d N/A | d N/A | d N/A | d N/A |
| | Miscellaneous components | d $ 2,235 | d incl in 152k | d incl in456k | d N/A | d N/A | d $ 1,200 | d N/A | d $ 2,100 | d incl in 158k | d $ 1,211 | d incl in 186k |
| | Installation & Training | d $ 24,000 | d $ 12,000 | d $ 36,000 | d N/A | d N/A | d incl in 98k | d N/A | d incl in 92k | d incl in 30k | d $ 30,000 | d $ 12,000 |
| | Freight (1%) | d $ 4,400 | d $ 2,000 | d $ 6,000 | d N/A | d N/A | d $ 800 | d N/A | d $ 900 | d $ 1,500 | d $ 5,000 | d $ 2,000 |
| | Total Microwave | D $ 665,000 | D $ 166,250 | D $ 498,750 | D 0 | D 0 | D $ 125,000 | D 0 | D $ 220,000 | D $ 160,000 | D $ 542,000 | D $ 200,000 |
| Satellite | Is Satellite Earth Station co-located with Studio? | Yes | No | No | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| | Satellite Demodulators (5) | e $ 35,000 | e N/A | e N/A | e $ 21,000 | e $ 14,000 | e $ 14,000 | e $ 14,000 | e $ 35,000 | e $ 35,000 | e $ 35,000 | e N/A |
| | Total Satellite | E $ 35,000 | E $ - | E $ - | E $ 21,000 | E $ 14,000 | E $ 14,000 | E $ 14,000 | E $ 35,000 | E $ 35,000 | E $ 35,000 | E $ - |
| Processing | 4 SD Decoders | f $ 20,000 | f N/A | f N/A | f $ 20,000 | f N/A | f $ 20,000 | f $ 20,000 | f $ 20,000 | f $ 20,000 | f $ 20,000 | f N/A |
| | Component Dgtl Router 32x32 | f $ 59,200 | f N/A | f N/A | f $ 59,200 | f $ 30,000 | f N/A | f $ 59,200 | f $ 59,200 | f $ 59,200 | f $ 59,200 | f N/A |
| | Router Control System | f $ 18,000 | f N/A | f N/A | f $ 18,000 | f $ 18,000 | f N/A | f $ 18,000 | f $ 18,000 | f $ 18,000 | f $ 25,000 | f N/A |
| | Router Control Panels (10) | f $ 20,000 | f N/A | f N/A | $ 20,000 | f $ 10,000 | f N/A | f $ 20,000 | f $ 20,000 | f $ 20,000 | f $ 20,000 | f N/A |
| | NTSC to Component Dgtl (2) | f $ 23,000 | f N/A | f N/A | f $ 23,000 | f $ 23,000 | f N/A | f $ 23,000 | f $ 23,000 | f $ 23,000 | f $ 23,000 | f N/A |
| | Multi Channel Server | f $ 251,000 | f N/A | f N/A | f $ 251,000 | f $ 125,000 | f N/A | f $ 251,000 | f (3) $ 500,000 | f $ 251,000 | f $ 398,900 | f N/A |
| | Component Master Ctrl Swr | f $ 244,000 | f N/A | f N/A | f $ 244,000 | f $ 138,000 | f N/A | f $ 244,000 | f $ 244,000 | f $ 244,000 | f $ 277,000 | f N/A |
| | AES Audio Router 64x64 | f $ 44,000 | f N/A | f N/A | f $ 44,000 | f $ 22,000 | f N/A | f $ 44,000 | f $ 44,000 | f $ 44,000 | f $ 44,000 | f N/A |
| | Video distribution equip. | f $ 22,000 | f N/A | f N/A | f $ 22,000 | f $ 11,000 | f $ 5,000 | f $ 22,000 | f $ 22,000 | f $ 22,000 | f $ 20,000 | f N/A |

| | Organization Abbreviation | BRPTV | | | CVETC | | | | | HRETA | SVETC | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | City | Roanoke | Marion | Norton | Richmond | Richmond | Charlottesville | Fairfax | Goldvein | Hampton Norfolk | Harrisonburg Staunton | Front Royal |
| | Call Letters | WBRA-TV | WMSY-TV | WSBN-TV | WCVE-TV | WCVW-TV | WHTJ-TV | WNVC-TV | WNVT-TV | WHRO-TV | WVPT | WVPY |
| Processing Continued | Audio distribution equip. | f $ 16,000 | f N/A | f N/A | f $ 16,000 | f $ 8,000 | f $ 4,000 | f $ 16,000 | f $ 16,000 | f $ 16,000 | f $ 16,000 | f N/A |
| | 4 Logomotion Inserters | f $ 52,000 | f N/A | f N/A | f $ 52,000 | f $ 26,000 | f N/A | f $ 52,000 | f $ 52,000 | f $ 52,000 | f $ 52,000 | f N/A |
| | Video Monitors | f $ 40,000 | f N/A | f N/A | f $ 40,000 | f $ 20,000 | f $ 10,000 | f $ 40,000 | f $ 40,000 | f $ 40,000 | f $ 10,500 | f N/A |
| | Waveform Monitors | f $ 32,500 | f N/A | f N/A | f $ 32,500 | f $ 13,000 | f $ 6,500 | f $ 32,500 | f $ 32,500 | f $ 32,500 | f $ 6,500 | f N/A |
| | Audio Monitoring | f $ 5,000 | f N/A | f N/A | f $ 5,000 | f $ 2,500 | f $ 2,500 | f $ 5,000 | f $ 10,000 | f $ 5,000 | f $ 5,000 | f N/A |
| | Audio Metering | f $ 25,000 | f N/A | f N/A | f $ 25,000 | f $ 12,500 | f $ 5,000 | f $ 25,000 | f $ 25,000 | f $ 25,000 | f $ 18,000 | f N/A |
| | EAS | f $ 7,000 | f N/A | f N/A | f $ 7,000 | f $ 7,000 | f $ 7,000 | f $ 7,000 | f $ 7,000 | f $ 7,000 | f $ 7,000 | f $ 7,000 |
| | Sync System | f $ 18,000 | f N/A | f N/A | $ 18,000 | $ 9,000 | f N/A | $ 18,000 | $ 18,000 | $ 18,000 | f $ 14,400 | N/A |
| | | | | | | | | | | | | |
| | HD Decoder | f $ 15,000 | f N/A | f N/A | f $ 15,000 | f N/A | f N/A | f $ 15,000 | f $ 15,000 | f $ 15,000 | f $ 15,000 | f N/A |
| | 19.4 Mb/s Splicer/switcher | f $ 25,000 | f N/A | f N/A | f $ 25,000 | f $ 25,000 | f N/A | f $ 25,000 | f $ 25,000 | f $ 25,000 | f $ 25,000 | f N/A |
| | 19.4 Mb/s Server | f $ 40,000 | f N/A | f N/A | f $ 40,000 | f $ 40,000 | f N/A | f $ 40,000 | f $ 40,000 | f $ 40,000 | f $ 40,000 | f N/A |
| | HD Logo Inserter | f $ 8,000 | f N/A | f N/A | f $ 8,000 | f N/A | f N/A | f $ 8,000 | f $ 8,000 | f $ 8,000 | f $ 8,000 | f N/A |
| | 2 HD Color Monitors | f $ 45,000 | f N/A | f N/A | f $ 45,000 | f N/A | f $ 45,000 | f $ 45,000 | f $ 45,000 | f $ 45,000 | f $ 45,000 | f N/A |
| | HD Waveform Monitor | f $ 15,000 | f N/A | f N/A | f $ 15,000 | f N/A | f $ 15,000 | f $ 15,000 | f $ 15,000 | f $ 15,000 | f $ 15,000 | f N/A |
| | | | | | | | | | | | | |
| | 4 SD Encoders incl AC-3 | f $ 180,000 | f N/A | f N/A | f $ 180,000 | f $ 180,000 | f N/A | f $ 393,600 | f $ 393,600 | f $ 180,000 | f $ 180,000 | f N/A |
| | HD Encoder incl AC-3 | f $ 224,000 | f N/A | f N/A | f $ 224,000 | f N/A | f N/A | f incl in 394k | f incl in 394k | f $ 224,000 | f $ 224,000 | f N/A |
| | PSIP Generator | f $ 60,000 | f $ 60,000 | f $ 60,000 | f $ 60,000 | f $ 60,000 | f $ 60,000 | f $ 60,000 | f $ 60,000 | f $ 60,000 | f $ 35,000 | f $ 35,000 |
| | Transport Multiplexer | f $ 50,000 | f $ 50,000 | f $ 50,000 | f $ 50,000 | f $ 50,000 | f $ 50,000 | f $ 50,000 | f $ 50,000 | f $ 50,000 | f $ 50,000 | f $ 50,000 |
| | Test Equipment | f $ 25,000 | f $ 25,000 | f $ 25,000 | f $ 25,000 | f N/A | f $ 25,000 | f $ 25,000 | f $ 25,000 | f $ 25,000 | f $ 30,000 | f $ 10,000 |
| | | | | | | | | | | | | |
| | Racks and Hardware | f $ 15,000 | f N/A | f N/A | f $ 15,000 | f $ 5,000 | f $ 5,000 | f $ 12,000 | f $ 42,000 | f $ 15,000 | f $ 15,000 | f N/A |
| | Cable and Connectors | f $ 10,000 | f N/A | f N/A | f $ 10,000 | f $ 5,000 | f $ 5,000 | f $ 10,000 | f $ 35,000 | f $ 10,000 | f $ 10,000 | f N/A |
| | Jackfields | f $ 12,000 | f N/A | f N/A | f $ 12,000 | f $ 12,000 | f $ 2,000 | f $ 12,000 | f $ 21,000 | f $ 12,000 | f $ 12,000 | f N/A |
| | Miscellaneous | f $ 10,000 | f $ 10,000 | f $ 10,000 | f $ 10,000 | f $ 5,000 | f $ 5,000 | f $ 10,000 | f $ 25,000 | f $ 10,000 | f $ 10,000 | f $ 10,000 |
| | | | | | | | | | | | | |
| | Installation & Training | f $ 15,000 | f N/A | f N/A | f $ 15,000 | f $ 7,500 | $ 7,500 | f $ 15,000 | f $ 15,000 | f $ 15,000 | f $ 15,000 | f N/A |
| | Freight (0.5%) | f $ 8,100 | f $ 5,300 | f $ 5,300 | f $ 8,100 | f $ 4,000 | $ 2,000 | f $ 8,100 | f $ 9,800 | f $ 8,100 | f $ 8,700 | f N/A |
| | | | | | | | | | | | | |
| | Total Processing | F $ 1,653,800 | F $ 150,300 | F $ 150,300 | F $ 1,653,800 | F $ 868,500 | F $ 281,500 | F $ 1,640,400 | F $ 1,975,100 | F $ 1,653,800 | F $ 1,754,200 | F $ 112,000 |
| | | | | | | | | | | | | |
| Studio Bldg | Building Modifications | Space can be developed in 'warehouse' area of building | N/A | N/A | Floor space not expected to be a problem. Existing areas can be modified. | N/A | N/A | When WNVT moves to new facilty space will be available, series of 'hop scotch' moves required. | Moving to brand new facility, currently under design. | Floor space not expected to be a problem. Existing areas can be modified. | Will require new wing to building for all tech areas with exception of studio. | N/A |
| | Building Modification Cost | g $ 150,000 | g N/A | g N/A | g $ 150,000 | g N/A | g N/A | g $ 50,000 | g N/A | g $ 150,000 | g $ 1,316,500 | g N/A |
| | HVAC | g incl in 150k | g N/A | g N/A | g N/A | g N/A | g N/A | g N/A | g N/A | g incl in 150k | g incl in 1m | g N/A |
| | Power | g incl in 150k | g N/A | g N/A | g N/A | g N/A | g N/A | g $ 40,000 | g N/A | g incl in 150k | g incl in 1m | g N/A |
| | | | | | | | | | | | | |
| | Total Studio Bldg. Mods. | G $ 150,000 | G $ - | G $ - | G $ 150,000 | G $ - | G $ - | G $ 90,000 | G $ - | G $ 150,000 | G $ 1,316,500 | G $ - |
| | | | | | | | | | | | | |
| I | **Phase 1 Total (A to G)** | $3,599,276 | $1,659,407 | $1,991,907 | $2,992,914 | $2,039,114 | $1,479,000 | $3,151,051 | $3,228,905 | $3,256,593 | $4,266,911 | $1,068,728 |

| | Organization Abbreviation | BRPTV | | | CVETC | | | | | HRETA | SVETC | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | City | Roanoke | Marion | Norton | Richmond | Richmond | Charlottesville | Fairfax | Goldvein | Hampton Norfolk | Harrisonburg Staunton | Front Royal |
| | Call Letters | WBRA-TV | WMSY-TV | WSBN-TV | WCVE-TV | WCVW-TV | WHTJ-TV | WNVC-TV | WNVT-TV | WHRO-TV | WVPT | WVPY |
| 2 | **Phase 2 (Component Conversion)** | | | | | | | | | | | |
| Terminal | Expand AES Audio Router | h $ 57,000 | h N/A | h N/A | h $ 57,000 | h N/A | h N/A | h $ 57,000 | h $ 57,000 | h $ 57,000 | h $ 57,000 | h N/A |
| | Expand Component Router | h $ 67,000 | h N/A | h N/A | h $ 67,000 | h N/A | h N/A | h $ 67,000 | h $ 67,000 | h $ 67,000 | h $ 67,000 | h N/A |
| | RS422 Control router | h $ 22,700 | h N/A | h N/A | h $ 22,700 | h N/A | h N/A | h $ 22,700 | h $ 22,700 | h $ 22,700 | h $ 22,700 | h N/A |
| | Composite Router | h $ 60,000 | h N/A | h N/A | h N/A | h N/A | h N/A | h N/A | h $ 60,000 | h N/A | h $ 60,000 | h N/A |
| | Addn'l Router Ctrl Panels (20) | h $ 40,000 | h N/A | h N/A | h $ 40,000 | h N/A | h N/A | h $ 40,000 | h $ 40,000 | h $ 40,000 | h $ 40,000 | h N/A |
| | Video distribution equip. | h $ 80,000 | h N/A | h N/A | h $ 20,000 | h $ 20,000 | h $ 20,000 | h $ 80,000 | h $ 80,000 | h $ 80,000 | h $ 54,300 | h N/A |
| | Audio distribution equip. | h $ 64,000 | h N/A | h N/A | h $ 15,000 | h $ 15,000 | h $ 15,000 | h $ 64,000 | h $ 64,000 | h $ 64,000 | h $ 30,000 | h N/A |
| | Sync System Augmentation | h $ 18,200 | h N/A | h N/A | h $ 18,200 | h N/A | h N/A | h $ 18,200 | h $ 18,200 | h $ 18,200 | h N/A | h N/A |
| | A/V Test Signal Gens. | h $ 15,000 | h N/A | h N/A | h $ 15,000 | h N/A | h N/A | h $ 15,000 | h $ 15,000 | h $ 15,000 | h $ 15,000 | h N/A |
| | Logomotion Inserter | h $ 13,000 | h N/A | h N/A | h $ 15,000 | h N/A | h N/A | h $ 13,000 | h $ 13,000 | h $ 13,000 | h $ 13,000 | h N/A |
| | A/D & D/A Convert & VFS | h $ 190,000 | h N/A | h N/A | h $ 200,000 | h $ 200,000 | h $ 100,000 | h $ 190,000 | h $ 190,000 | h $ 190,000 | h $ 192,500 | h N/A |
| | Total Terminal | H $ 626,900 | H $ - | H $ - | H $ 469,900 | H $ 235,000 | H $ 135,000 | H $ 566,900 | H $ 626,900 | H $ 566,900 | H $ 551,500 | H $ - |
| Studio | Studio Switcher | k $ 86,000 | k N/A | k N/A | k $ 86,000 | k N/A | k N/A | k $ 140,000 | k $ 280,000 | k $ 200,000 | k $ 126,500 | k N/A |
| | Studio Digital Effects | k $ 112,000 | k N/A | k N/A | k $ 112,000 | k N/A | k N/A | k $ 112,000 | k $ 112,000 | k incl in 200k | k $ 112,000 | k N/A |
| | Qty of Cameras required | 3 | k N/A | k N/A | 4 | N/A | N/A | 3 | 6 | 4 | Use existing | |
| | Studio 16:9 / 4:3 Cameras | k $ 363,000 | k N/A | k N/A | k $ 484,000 | k N/A | k N/A | k $ 363,000 | k(3) $ 726,000 | k $ 484,000 | k $ - | k N/A |
| | Camera Control Station | k $ 66,000 | k N/A | k N/A | k $ 66,000 | k N/A | k N/A | k $ 66,000 | k(3) $ 132,000 | k $ 66,000 | Use existing | k N/A |
| | Graphics / Char. Gen. | k $ 54,000 | k N/A | k N/A | k $ 54,000 | k $ 65,000 | k $ 65,000 | k $ 65,000 | k $ 130,000 | k $ 55,000 | k $ 100,000 | k N/A |
| | Still Store | k $ 37,800 | k N/A | k N/A | k $ 37,800 | k N/A | k N/A | k $ 40,000 | k $ 80,000 | k $ 40,000 | k N/A | k N/A |
| | Total Studio | K $ 718,800 | K $ - | K $ - | K $ 839,800 | K $ 65,000 | K $ 65,000 | K $ 786,000 | K $ 1,460,000 | K $ 845,000 | K $ 338,500 | K $ - |
| VTR | Qty of VTRs required | 6, reuse 10 SX | m N/A | m N/A | 16, reuse 5 DigBeta | m N/A | m N/A | 10 | 10 | 10. Reuse 2 SX | 12 | |
| | Digital Component VTRs | m $ 180,000 | m N/A | m N/A | m $ 480,000 | m N/A | m N/A | m $ 300,000 | m $ 300,000 | m $ 300,000 | m $ 360,000 | m N/A |
| | VTR support Monitoring | m $ 30,000 | m N/A | m N/A | m $ 80,000 | m N/A | m N/A | m $ 50,000 | m $ 50,000 | m $ 50,000 | m $ 60,000 | m N/A |
| | VTR Misc | m $ 15,000 | m N/A | m N/A | m $ 40,000 | m N/A | m N/A | m $ 25,000 | m $ 25,000 | m $ 25,000 | m $ 30,000 | m N/A |
| | Total VTR | M $ 225,000 | M $ - | M $ - | M $ 600,000 | M $ - | M $ - | M $ 375,000 | M $ 375,000 | M $ 375,000 | M $ 450,000 | M $ - |
| Edit | Edit Room Switcher | n incl in 190k | n N/A | n N/A | n $ 50,000 | n N/A | n N/A | n incl in 190k | n incl in 380k | n $ 50,000 | n $ 175,500 | n N/A |
| | Edit Room Audio Mixer | n incl in 190k | n N/A | n N/A | n $ 30,000 | n N/A | n N/A | n incl in 190k | n incl in 380k | n $ 30,000 | n $ 88,000 | |
| | Edit VTRs | n $ 30,000 | n N/A | n N/A | n $ 60,000 | n N/A | n N/A | n $ 30,000 | n $ 60,000 | n $ 60,000 | incl in VTR above | n N/A |
| | Non-Linear Editor | n $ 190,000 | n N/A | n N/A | n $ 140,000 | n N/A | n N/A | n $ 190,000 | n(3) $ 380,000 | n $ 101,000 | n $ 140,000 | n N/A |
| | Edit Room Mon. & Misc. | n $ 16,000 | n N/A | n N/A | n $ 20,000 | n N/A | n N/A | n $ 16,000 | n $ 32,000 | n $ 20,000 | n $ 20,000 | n N/A |
| | Total Edit | N $ 236,000 | N $ - | N $ - | N $ 300,000 | N $ - | N $ - | N $ 236,000 | N $ 472,000 | N $ 300,000 | N $ 384,500 | N $ - |
| HDTV | HDTV Router (32x32) | p $ 52,000 | p N/A | p N/A | p $ 52,000 | p N/A | p N/A | p $ 52,000 | p $ 52,000 | p $ 52,000 | p $ 52,000 | p N/A |
| | HDTV VTRs (3) | p $ 297,000 | p N/A | p N/A | p $ 297,000 | p N/A | p N/A | p $ 297,000 | p $ 297,000 | p $ 297,000 | p $ 297,000 | p N/A |
| | HD Upconverter | p $ 70,000 | p N/A | p N/A | p $ 70,000 | p N/A | p N/A | p $ 70,000 | p $ 70,000 | p $ 70,000 | p $ 70,000 | p N/A |
| | HD Downconverter | p $ 50,000 | p N/A | p N/A | p $ 50,000 | p N/A | p N/A | p $ 50,000 | p $ 50,000 | p $ 50,000 | p $ 50,000 | p N/A |
| | Test Equipment | p $ 75,000 | p N/A | p N/A | p $ 50,000 | p N/A | p N/A | p $ 75,000 | p $ 75,000 | p $ 75,000 | p $ 75,000 | p N/A |
| | Total HDTV | P $ 544,000 | P $ - | P $ - | P $ 519,000 | P $ - | P $ - | P $ 544,000 | P $ 544,000 | P $ 544,000 | P $ 544,000 | P $ - |

| | Organization Abbreviation | BRPTV | | | CVETC | | | | | HRETA | SVETC | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | City | Roanoke | Marion | Norton | Richmond | Richmond | Charlottesville | Fairfax | Goldvein | Hampton Norfolk | Harrisonburg Staunton | Front Royal |
| | Call Letters | WBRA-TV | WMSY-TV | WSBN-TV | WCVE-TV | WCVW-TV | WHTJ-TV | WNVC-TV | WNVT-TV | WHRO-TV | WVPT | WVPY |
| Other | Racks and Hardware | q $ 74,000 | q N/A | q N/A | q $ 70,000 | q N/A | q N/A | q $ 18,000 | q $ 46,000 | q $ 74,000 | q $ 49,000 | q N/A |
| | Cable and Connectors | q $ 25,000 | q N/A | q N/A | q $ 31,000 | q N/A | q N/A | q $ 20,000 | q $ 40,000 | q $ 25,000 | q $ 25,000 | q N/A |
| | Jackfields | q $ 30,000 | q N/A | q N/A | q $ 36,000 | q $ 36,000 | q $ 6,000 | q $ 30,000 | q $ 36,000 | q $ 30,000 | q $ 16,000 | q N/A |
| | Miscellaneous | q $ 10,400 | q N/A | q N/A | q $ 15,000 | q N/A | q N/A | q $ 10,000 | q $ 20,000 | q $ 10,400 | q $ 10,400 | q N/A |
| | Systems Integration | q $ 150,000 | q N/A | q N/A | q $ 130,000 | q N/A | q N/A | q $ 150,000 | q $ 150,000 | q $ 150,000 | q $ 300,000 | q N/A |
| | Training | q $ 15,000 | q N/A | q N/A | q $ 15,000 | q N/A | q N/A | q $ 15,000 | q $ 15,000 | q $ 15,000 | q $ 20,000 | q N/A |
| | Phase 2 Freight (0.5%) | q $ 14,000 | q N/A | q N/A | q $ 16,000 | q N/A | q N/A | q $ 15,000 | q $ 20,000 | q $ 15,000 | q $ 65,000 | q N/A |
| | Total Other | Q $ 318,400 | Q $ - | Q $ - | Q $ 313,000 | Q $ 36,000 | Q $ 6,000 | Q $ 258,000 | Q $ 327,000 | Q $ 319,400 | Q $ 485,400 | Q $ - |
| Studio Bldg. | Additional Building Modifications | r N/A | r N/A | r N/A | r $ 10,000 | r N/A | r N/A | r N/A | r N/A | r N/A | r N/A | r N/A |
| | HVAC | r N/A | r N/A | r N/A | r $ 20,000 | r N/A | r N/A | r N/A | r N/A | r N/A | r N/A | r N/A |
| | Power | r N/A | r N/A | r N/A | r $ 5,000 | r N/A | r N/A | r N/A | r N/A | r N/A | r N/A | r N/A |
| | UPS | r $ 220,000 | r N/A | r N/A | r $ 70,000 | r $ 70,000 | r N/A | r $ 220,000 | r $ 220,000 | r N/A | r N/A | r N/A |
| | Total Studio Bldg. Add. Mods | R $ 220,000 | R $ - | R $ - | R $ 105,000 | R $ 70,000 | R $ - | R $ 220,000 | R $ 220,000 | R $ - | R $ - | R $ - |
| 2 | **Phase 2 Total (H to R)** | $ 2,889,100 | $ - | $ - | $ 3,146,700 | $ 406,000 | $ 206,000 | $ 2,985,900 | $ 4,024,900 | $ 2,950,300 | $ 2,753,900 | $ - |
| 3 | **Phase 3 Operation (Realization of Complete Individual Station Plans )** | | | | | | | | | | | |
| | Full Server System | s $ 650,000 | s N/A | s N/A | s $ 750,000 | s N/A | s N/A | s $ 650,000 | s $ 800,000 | s $ 800,000 | s $ 250,000 | s N/A |
| | Additional VTRs | s $ 120,000 | s N/A | s N/A | s $ 196,000 | s $ 196,000 | s N/A | s $ 120,000 | s $ 120,000 | s N/A | s $ 165,000 | s N/A |
| | Additional HD VTRs | s $ 198,000 | s N/A | s N/A | s $ 198,000 | s $ 198,000 | s N/A | s $ 198,000 | s $ 198,000 | s N/A | s $ 198,000 | s N/A |
| | Total Storage | S $ 968,000 | S $ - | S $ - | S $ 1,144,000 | S $ 394,000 | S $ - | S $ 968,000 | S $ 1,118,000 | S $ 800,000 | S $ 613,000 | S $ - |
| MCR | Full Automation | t $ 860,000 | t N/A | t N/A | t $ 860,000 | t N/A | t N/A | t $ 860,000 | t $ 860,000 | t $ 860,000 | t $ 860,000 | t N/A |
| | Full MCR Monitoring | t $ 143,000 | t N/A | t N/A | t $ 100,000 | t $ 100,000 | t N/A | t $ 143,000 | t $ 143,000 | t $ 143,000 | t $ 206,200 | t N/A |
| | MCR Emerg Switcher | t $ 33,000 | t N/A | t N/A | t $ 30,000 | t $ 30,000 | t N/A | t $ 33,000 | t $ 33,000 | t $ 33,000 | t N/A | t N/A |
| | HD MCR Switcher | t $ 125,000 | t N/A | t N/A | t $ 130,000 | t $ 130,000 | t N/A | t $ 125,000 | t $ 125,000 | t $ 125,000 | t N/A | t N/A |
| | MCR Graphics | t $ 77,500 | t N/A | t N/A | t $ 50,000 | t $ 50,000 | t N/A | t $ 77,500 | t $ 77,500 | t $ 77,500 | t $ 100,000 | t N/A |
| | MCR Still Store | t $ 117,300 | t N/A | t N/A | t $ 117,300 | $ 50,000 | N/A | t $ 117,300 | t $ 117,300 | t $ 117,300 | t $ 117,300 | N/A |
| | MCR Misc | t $ 12,000 | t N/A | t N/A | t $ 15,000 | t $ 15,000 | t N/A | t $ 12,000 | t $ 12,000 | t $ 12,000 | t $ 12,000 | t N/A |
| | Total MCR | T $ 1,367,800 | T $ - | T $ - | T $ 1,302,300 | T $ 375,000 | T $ - | T $ 1,367,800 | T $ 1,367,800 | T $ 1,367,800 | T $ 1,295,500 | T $ - |
| Studio | Studio Audio Console | u $ 70,000 | u N/A | u N/A | u $ 80,000 | u N/A | u N/A | u $ 70,000 | u $ 70,000 | u $ 70,000 | u $ 64,000 | u N/A |
| | Studio Audio Components | u $ 27,300 | u N/A | u N/A | u $ 25,000 | u N/A | u N/A | u $ 27,300 | u $ 27,300 | u $ 27,300 | u $ 25,000 | u N/A |
| | Consoles | u $ 56,000 | u N/A | u N/A | u $ 50,000 | u N/A | u N/A | u $ 50,000 | u $ 50,000 | u $ 56,000 | u $ 50,000 | u N/A |
| | Video Monitoring | u $ 71,000 | u N/A | u N/A | u $ 80,000 | u N/A | u N/A | u $ 71,000 | u $ 71,000 | u $ 71,000 | u $ 119,000 | u N/A |
| | Under Monitor Displays | u $ 32,000 | u N/A | u N/A | u $ 25,000 | u N/A | u N/A | u $ 32,000 | u $ 32,000 | u $ 32,000 | u $ 25,000 | u N/A |
| | Studio CR Misc | u $ 35,000 | u N/A | u N/A | u $ 30,000 | u N/A | u N/A | u $ 35,000 | u $ 35,000 | u $ 35,000 | u $ 15,000 | u N/A |
| | Teleprompter System | u $ 15,000 | u N/A | u N/A | u $ 17,000 | u N/A | u N/A | u $ 15,000 | u $ 30,000 | u $ 15,000 | u N/A | u N/A |
| | Intercom, Clocks | u $ 9,000 | u N/A | u N/A | u $ 10,000 | u N/A | u N/A | u $ 9,000 | u $ 55,000 | u $ 9,000 | u $ 30,500 | u N/A |
| | Microphones | u $ 26,000 | u N/A | u N/A | u $ 25,000 | u N/A | u N/A | u $ 20,000 | u $ 35,000 | u $ 26,000 | u N/A | u N/A |
| | Lighting | u N/A | u N/A | u N/A | u N/A | u N/A | u N/A | u N/A | u N/A | u $ 30,000 | u $ 60,000 | N/A |
| | Cable | u $ 15,000 | u N/A | u N/A | u $ 10,000 | u N/A | u N/A | u $ 10,000 | u $ 25,000 | u $ 15,000 | u incl in S.I. | u N/A |
| | Total Studio | U $ 356,300 | U $ - | U $ - | U $ 352,000 | U $ - | U $ - | U $ 339,300 | U $ 430,300 | U $ 386,300 | U $ 388,500 | U $ - |

| | Organization Abbreviation | BRPTV | | | CVETC | | | | | HRETA | SVETC | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | City | Roanoke | Marion | Norton | Richmond | Richmond | Charlottesville | Fairfax | Goldvein | Hampton Norfolk | Harrisonburg Staunton | Front Royal |
| | Call Letters | WBRA-TV | WMSY-TV | WSBN-TV | WCVE-TV | WCVW-TV | WHTJ-TV | WNVC-TV | WNVT-TV | WHRO-TV | WVPT | WVPY |
| Graphics | Graphics System | v $ 112,000 | v N/A | v N/A | v $ 100,000 | v $ 100,000 | v N/A | v $ 178,000 | v $ 356,000 | v $ 50,000 | v $ 50,000 | v N/A |
| Graphics | Monitoring | v $ 12,000 | v N/A | v N/A | v $ 15,000 | v $ 15,000 | v N/A | v $ 12,000 | v $ 24,000 | v $ 36,000 | v $ 36,000 | v N/A |
| Graphics | Graphics VTR | v $ 30,000 | v N/A | v N/A | v $ 35,000 | v $ 35,000 | v N/A | v $ 30,000 | v $ 60,000 | v N/A | v N/A | v N/A |
| Graphics | Graphics Misc | v $ 6,500 | v N/A | v N/A | v $ 5,000 | v $ 5,000 | v N/A | v $ 6,500 | v $ 13,000 | v $ 5,000 | v $ 5,000 | v N/A |
| Graphics | Total Graphics | V $ 160,500 | V $ - | V $ - | V $ 155,000 | V $ 155,000 | V $ - | V $ 226,500 | V $ 453,000 | V $ 91,000 | V $ 91,000 | V $ - |
| Other | Intercom | w $ 41,000 | w N/A | w N/A | w N/A | w N/A | w N/A | w $ 20,000 | w $ 42,000 | w $ 42,000 | w $ 42,000 | w N/A |
| Other | Repeater Facilities | w N/A | w N/A | w N/A | w N/A | w N/A | w N/A | w N/A | w N/A | w N/A | w $ 2,500,000 | w N/A |
| Other | Digital Audio Edit | w $ 34,500 | w N/A | w N/A | w N/A | w N/A | w N/A | w $ 34,500 | w $ 34,500 | w $ 34,500 | w $ 34,500 | w N/A |
| Other | Field Acquisition | w $ 190,500 | w N/A | w N/A | w N/A | w N/A | w N/A | w $ 275,000 | w $ 550,000 | w $ 170,000 | w $ 180,000 | w N/A |
| Other | Systems Integration | w $ 150,000 | w N/A | w N/A | w $ 150,000 | w $ 75,000 | w N/A | w $ 150,000 | w $ 250,000 | w $ 150,000 | w $ 200,000 | w N/A |
| Other | Training | w $ 20,000 | w N/A | w N/A | w $ 20,000 | w N/A | w N/A | w $ 20,000 | w $ 25,000 | w $ 20,000 | w $ 25,000 | w N/A |
| Other | Phase 3 Freight (0.5%) | w $ 20,000 | w N/A | w N/A | w $ 35,000 | w $ 10,000 | w N/A | w $ 18,000 | w $ 22,000 | w $ 9,000 | w $ 15,000 | w N/A |
| Other | Total Other | W $ 456,000 | W $ - | W $ - | W $ 205,000 | W $ 85,000 | W $ - | W $ 517,500 | W $ 923,500 | W $ 425,500 | W $ 2,996,500 | W $ - |
| 3 | **Phase 3 Total (S to W)** | $ 3,308,600 | $ - | $ - | $ 3,158,300 | $ 1,009,000 | $ - | $ 3,419,100 | $ 4,292,600 | $ 3,070,600 | $ 5,384,500 | $ - |
| | **GRAND TOTAL** | $9,796,976 | $1,659,407 | $1,991,907 | $9,297,914 | $3,454,114 | $1,685,000 | $9,556,051 | $11,546,405 | $9,277,493 | $12,405,311 | $1,068,728 |

# VIRGINIA PUBLIC TELEVISION STATIONS

## Conversion to Digitlal Television - Cost Estimate Summary

| Licensing Entity | Blue Ridge Public Television, Inc. | | | Central Virginia Educational Telecommunications Corporation | | | | | Hampton Roads Educational Telecommunications Association, Inc | Shenandoah Valley Educational Television Corporation | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Organization Abbreviation | (BRPTV) | | | (CVETC) | | | | | (HRETA) | (SVETC) | | |
| City | Roanoke | Marion | Norton | Richmond | Richmond | Charlottesville | Fairfax | Goldvein | Hampton Norfolk | Harrisonburg Staunton | Front Royal | |
| Call Letters | WBRA-TV | WMSY-TV | WSBN-TV | WCVE-TV | WCVW-TV | WHTJ-TV | WNVC-TV | WNVT-TV | WHRO-TV | WVPT | WVPY | |
| Phase 1 Estimate | $3,599,276 | $1,659,407 | $1,991,907 | $2,992,914 | $2,039,114 | $1,479,000 | $3,151,051 | $3,228,905 | $3,256,593 | $4,266,911 | $1,068,728 | $28,733,805 |
| Phase 2 Estimate | $2,889,100 | $0 | $0 | $3,146,700 | $406,000 | $206,000 | $2,985,900 | $4,024,900 | $2,950,300 | $2,753,900 | $0 | $19,362,800 |
| Phase 3 Estimate | $3,308,600 | $0 | $0 | $3,158,300 | $1,009,000 | $0 | $3,419,100 | $4,292,600 | $3,070,600 | $5,384,500 | $0 | $23,642,700 |
| Station Totals | $9,796,976 | $1,659,407 | $1,991,907 | $9,297,914 | $3,454,114 | $1,685,000 | $9,556,051 | $11,546,405 | $9,277,493 | $12,405,311 | $1,068,728 | $71,739,305 |
| Licensing Entity Totals | $13,448,290 | | | $35,539,483 | | | | | $9,277,493 | $13,474,039 | | $71,739,305 |

## Appendix D

# Calculation of Multipliers for Factors Relating to Equity of Station Resources

In order to utilize measures of the equity of station resources in funding formulae, JLARC staff calculated two multipliers to represent: (1) the ability to leverage funding with current assets, and (2) the potential effort made to raise private contributions for the conversion. This appendix presents a brief description of the two multipliers and the calculations made to create them.

## Multiplier 1: The Ability to Leverage Funding With Current Assets

The multiplier used to represent the ability to leverage funding with current assets is calculated by comparing the total estimated cost of the conversion to net assets at each of the four public television corporations. Specifically, JLARC staff calculated the difference between net assets (as reported in each corporation's FY 1998 audited financial statement) and the estimated cost of the digital conversion (as reported in the Horowitz Television Technology report). These differences were than totaled across the four corporations. The multipliers used in the funding formula (Option 2) is each corporation's difference between assets and costs as a percentage of the total difference between assets and costs across all four corporations. Table D-1 presents this calculation in tabular form.

**Table D-1**

### Calculation of the Multiplier for the Ability to Leverage Funding

| Public Television Corporation | 1998 Net Assets | Estimated Cost of the Digital Conversion | Difference Between Cost and Assets | Percent of Total Difference = Multiplier |
|---|---|---|---|---|
| Blue Ridge Public TV | 5,253,109 | 13,448,290 | 8,195,181 | 40% |
| Central Virginia Public TV | $34,664,530 | $35,539,483 | $874,953 | 4% |
| Hampton Roads Public TV | 6,122,129 | 9,277,493 | 3,155,364 | 15% |
| Shenandoah Valley Public TV | 5,245,423 | 13,474,039 | 8,228,616 | 40% |
| **Total** | **$51,285,191** | **$71,739,305** | **$20,454,114** | **100%** |

Source: JLARC staff analysis.

## Multiplier 2: The Potential Effort Made to Raise Private Contributions

The multiplier used to represent the potential effort made to raise private funds for the conversion is a comparison of the effort made to raise private funds in FY 1998 (relative to the individual economic bases of the four corporations) to a hypothetical, consistent economic base for all four stations. Specifically, JLARC staff calculated two measures of each station's relative effort to raise private funds. These two measures correspond to the two historically consistent sources of private source revenue: individuals and businesses (primarily through underwriting).

First, JLARC staff calculated a measure of the effort to raise funds through individual donations by comparing actual individual contribution revenue received in FY 1998 as a percentage of the total of personal income of residents in each corporation's viewing area. Second, JLARC staff calculated a measure of the effort to raise funds through business contributions (underwriting) by comparing actual business contribution revenue received in FY 1998 as a percentage of total wage and salary disbursements in each corporation's viewing area (wage and salary data was found to be the only viable economic measure of "business presence" available for this type of analysis). Both personal income and wage and salary disbursement data was from 1997, the most recent data available.

Once these revenue percentages were calculated, JLARC staff then applied these to a consistent economic base for each measure to calculate potential private revenue for each corporation given the same economic base from which to draw those funds. The base available to Central Virginia Public TV was utilized in this calculation as it was the highest of the four economic bases.

In order to combine these two measures into one multiplier for application in the funding option, JLARC staff needed to sum these two "potential revenue" figures to obtain a system-wide total. The multiplier used in this funding formula (Option 2) for the measure of revenue effort are each corporation's potential revenue as a percentage of the total potential revenue across the four corporations relative to a consistent base. Table D-2, D-3, and D-4 present the steps of this calculation in tabular form.

**Table D-2**

# Calculation of Potential Individual Revenue at the Public Television Stations

**Calculation of the Percentage of Personal Income Raised**

| Public Television Corporation | 1998 Individual Contributions | 1997 Personal Income | Percentage of Personal Income Raised |
|---|---|---|---|
| Blue Ridge Public TV | $913,597 | $25,307,000,000 | .004% |
| Central Virginia Public TV | 2,174,018 | 115,509,000,000 | .002% |
| Hampton Roads Public TV | 2,521,590 | 36,209,000,000 | .007% |
| Shenandoah Valley Public TV | 515,412 | 16,907,000,000 | .003% |

**Calculation of the Potential Individual Contributions**

| Public Television Corporation | Assumed Base of Personal Income | Percentage of Personal Income Raised | Potential Individual Contributions |
|---|---|---|---|
| Blue Ridge Public TV | $115,509,000,000 | .004% | $4,169,940 |
| Central Virginia Public TV | 115,509,000,000 | .002% | 2,174,018 |
| Hampton Roads Public TV | 115,509,000,000 | .007% | 8,044,032 |
| Shenandoah Valley Public TV | 115,509,000,000 | .003% | 3,521,306 |

Source: JLARC staff analysis.

**Table D-3**

# Calculation of Potential Business Revenue at the Public Television Stations

**Calculation of the Percentage of Wage and Salary Disbursement Raised**

| Public Television Corporation | 1998 Business Contributions | 1997 Wage and Salary Disbursement* | Percentage of Wage and Salary Disbursement Raised |
|---|---|---|---|
| Blue Ridge Public TV | $183,735 | $10,850,476,890 | 0.002% |
| Central Virginia Public TV | 1,773,852 | 49,075,406,879 | 0.004% |
| Hampton Roads Public TV | 397,890 | 12,768,484,076 | 0.003% |
| Shenandoah Valley Public TV | 102,894 | 5,934,043,723 | 0.002% |

**Calculation of the Potential Business Contributions**

| Public Television Corporation | Assumed Wage and Salary Base | Percentage of Wages and Salary Raised | Potential Business Contributions |
|---|---|---|---|
| Blue Ridge Public TV | $49,075,406,879 | 0.002% | $831,011 |
| Central Virginia Public TV | 49,075,406,879 | 0.004% | 1,773,852 |
| Hampton Roads Public TV | 49,075,406,879 | 0.003% | 1,529,282 |
| Shenandoah Valley Public TV | 49,075,406,879 | 0.002% | 850,948 |

*Wage and Salary Disbursement is for private sector employers only.

Source: JLARC staff analysis.

**Table D-4**

## Calculation of the Multiplier for Revenue Effort

| Public Television Corporation | Potential Individual Contributions | Potential Business Contributions | Total Potential Private Contributions | Percent of Total = Multiplier |
|---|---|---|---|---|
| Blue Ridge Public TV | $4,169,940 | $831,011 | $5,000,952 | **22%** |
| Central Virginia Public TV | 2,174,018 | 1,773,852 | $3,947,870 | **17%** |
| Hampton Roads Public TV | 8,044,032 | 1,529,282 | $9,573,314 | **42%** |
| Shenandoah Valley Public TV | 3,521,306 | 850,948 | $4,372,255 | **19%** |
| | | **Total** | **$22,894,390** | **100%** |

Source: JLARC staff analysis.

## Appendix E: Inclusion of WETA in Illustrative Funding Options

October 12, 1999

MEMORANDUM

TO: Delegate Vincent F. Callahan, Vice-Chairman, JLARC

FROM: Philip A. Leone, Director

SUBJECT: Inclusion of WETA in Illustrative State Digital Conversion Funding for Public Television

At the request of the Vice-Chairman, JLARC staff have completed additional analysis for the report, The Impact of Digital TV on Public Broadcasting in Virginia, to include the Greater Washington Educational Telecommunications Association (WETA) in the illustrative State funding options contained in that report. This analysis is presented for informational purposes only and does not represent a staff recommendation that WETA be included in any future State digital conversion funding.

As in the report, JLARC staff used one-third of the total estimated conversion costs as the illustrative level of State funding. For the analysis completed by JLARC staff, WETA's assumed total conversion cost is $10.5 million. This figure is based on estimates provided to JLARC staff from WETA, and has not been scrutinized by the study team to the extent that the 11 Virginia stations' costs have been. Additionally, WETA has already incurred approximately $2.5 million of this cost. JLARC staff have

assumed that potential State funds will not reimburse these costs, therefore the outstanding cost for WETA has been assumed as $8 million.

In the attached tables, $2.8 million, or 35 percent of $8 million, is included for WETA's conversion costs. This is based on the fact that approximately 35 percent of WETA's viewers are Virginians, while the remaining viewers are citizens of other political jurisdictions (primarily Washington, DC and Maryland). As such, WETA would have additional potential "state" sources of conversion funds which the current Virginia stations do not have. The percentage of costs met by State funds refers to the outstanding cost of $8 million, as this represents the true percentage of station costs met by Virginia funds.

Net assets for WETA represent an estimate for net assets as of June 30, 1999 (data for all other stations are audited FY 1998 figures). The estimated FY 1999 amount was used for WETA because it had expended funds during FY 1999 for the conversion, therefore 1998 net assets would not accurately represent the most current financial situation.

The following five tables mirror the five tables representing the funding options presented in the full report, with the addition of WETA. The total conversion costs used include $2.8 million from WETA. Therefore, the assumed State funding level varies from approximately $19.8 million to approximately $24.9 million depending on the factors considered. The multipliers used in these tables are derived in the same way as they are in the report itself, and are not presented here. A full discussion of the calculation of these multipliers can be found in Appendix D of the full report.

PAL/sef

cc: JLARC Members

## Table A

## Illustrative Funding Option 1: Based on Proportion of Total Cost (Including WETA)

**Assumed State Funding Level of: $24,846,435**

| Public Television Corporation | Estimated Cost of the Digital Conversion | Percent of Statewide Total Conversion Cost | Resulting State Funding Provided | Percent of Station Costs Met By State Funds |
|---|---|---|---|---|
| Blue Ridge Public TV | $13,448,290 | 18% | $4,482,763 | 33% |
| Central Virginia Public TV | 35,539,483 | 48% | 11,846,494 | 33% |
| Hampton Roads Public TV | 9,277,493 | 12% | 3,092,498 | 33% |
| Shenandoah Valley Public TV | 13,474,039 | 18% | 4,491,346 | 33% |
| *Greater Washington Public TV* | *2,800,000* | *4%* | *933,333* | *12%* |
| **TOTAL** | **$74,539,305** | **100%** | **$24,846,435** | **33%** |

Notes: Cost estimates utilized for the Virginia stations are those presented in The Transition to Digital Television of Virginia's Public Television Stations, by Horowitz Television Technology, June 14, 1999. Total estimated conversion costs include only 35 percent ($2,800,000) of the total outstanding conversion costs ($8,000,000) as currently estimated by WETA, as JLARC staff estimate that 35 percent of its viewers are from Virginia. The assumed State funding level is derived from this total cost figure (including only 35 percent of WETA's estimated conversion costs). The percent of station costs met by State funds for WETA is derived from its total outstanding conversion costs ($8,000,000).

Source: JLARC staff analysis.

## Table B

## Illustrative Funding Option 2: Based on Equity of Station Resources (Including WETA)

### Assumed State Funding Level of: $24,846,435

| Public Television Corporation | Ability to Leverage Funding ($12 million) | | Effort Made to Raise Private Funds ($12 million) | | | | |
|---|---|---|---|---|---|---|---|
| | Multiplier | Resulting Funding | Multiplier | Resulting Funding | Total State Funding | Estimated Conversion Costs | % Met By State Funds |
| Blue Ridge Public TV | 40% | $5,102,719 | 16% | $2,033,790 | $7,136,510 | $13,448,290 | 53% |
| Central Virginia Public TV | 4% | 544,788 | 12% | 1,605,522 | 2,150,311 | 35,539,483 | 6% |
| Hampton Roads Public TV | 15% | 1,964,683 | 30% | 3,893,282 | 5,857,965 | 9,277,493 | 63% |
| Shenandoah Valley Public TV | 40% | 5,123,538 | 14% | 1,778,112 | 6,901,649 | 13,474,039 | 51% |
| *Greater Washington Public TV* | *0%* | *0* | *28%* | *2,800,000* | *2,800,000* | *2,800,000* | *35%* |
| | | | | **TOTAL** | **$24,846,435** | **$74,539,305** | **33%** |

Notes: Cost estimates utilized are those presented in The Transition to Digital Television of Virginia's Public Television Stations, by Horowitz Television Technology, June 14, 1999. Total estimated conversion costs include only 35 percent ($2,800,000) of the total outstanding conversion costs ($8,000,000) as currently estimated by WETA, as JLARC staff estimate that 35 percent of its viewers are from Virginia. The assumed State funding level is derived from this total cost figure (including only 35 percent of WETA's estimated conversion costs). It is also assumed that funding for WETA would be capped at $2,800,000. Thus, funding allocated to WETA by formula greater than this amount has reverted back into the formula for allocation to the other four stations based on the multipliers used in the report that exclude WETA. The percent of station costs met by State funds for WETA is derived from its total outstanding conversion costs ($8,000,000).

Source: JLARC staff analysis of station financial statements, of wage and salary data provided by the Virginia Employment Commission, and of personal income data provided by the United States Department of Commerce, Bureau of Economic Analysis.

## Table C

## Illustrative Funding Option 3: Based on Efficiency of Service Coverage (Including WETA)

**Assumed State Funding Level of: $19,846,262**

| Public Television Corporations | Number of Transmitters For State Funding | Funding Based Upon a Per Transmitter Amount | Estimated Conversion Costs | Percent of Costs Met By State Funds |
|---|---|---|---|---|
| Blue Ridge Public TV | 3 | $5,953,879 | $13,448,290 | 44% |
| Central Virginia Public TV | 3 | 5,953,879 | 20,538,965 | 29% |
| Hampton Roads Public TV | 1 | 1,984,626 | 9,277,493 | 21% |
| Shenandoah Valley Public TV | 2 | 3,969,252 | 13,474,039 | 29% |
| *Greater Washington Public TV* | *1* | *1,984,626* | *2,800,000* | *25%* |
| **TOTAL** | **10** | **$19,846,262** | **$59,538,787** | **33%** |

Notes: Cost estimates utilized are those presented in The Transition to Digital Television of Virginia's Public Television Stations, by Horowitz Television Technology, June 14, 1999. The number of transmitters for CVETC is reduced by two as per the discussion in Chapter IV of the full report. Thus, estimated conversion costs for CVETC exclude those costs associated with the conversion of WCVW in Richmond and WNVT in Northern Virginia. Total estimated conversion costs also include only 35 percent ($2,800,000) of the total outstanding conversion costs ($8,000,000) as currently estimated by WETA, as JLARC staff estimate that 35 percent of its viewers are from Virginia. The assumed State funding level is derived from this total cost figure (including only 35 percent of WETA's estimated conversion costs). The percent of station costs met by State funds for WETA is derived from its total outstanding conversion costs ($8,000,000).

Source: JLARC staff analysis.

## Table D

## Illustrative Funding Option 4: Based on Public Service Provided (Including WETA)

### Assumed State Funding Level of: $24,846,435

| Public Television Corporation | Potential ITV Population Served ($12 million) | | Percent of Potential Viewers ($12 million) | | Total State Funding | Estimated Conversion Costs | % Met By State Funds |
|---|---|---|---|---|---|---|---|
| | Percent of Total Served | Resulting Funding | Percent of Total Served | Resulting Funding | | | |
| Blue Ridge Public TV | 16% | $1,988,988 | 17% | $2,080,811 | $4,069,799 | $13,448,290 | 30% |
| Central Virginia Public TV | 51% | 6,298,189 | 39% | 4,796,503 | 11,094,693 | 35,539,483 | 31% |
| Hampton Roads Public TV | 25% | 3,158,316 | 23% | 2,814,387 | 5,972,702 | 9,277,493 | 64% |
| Shenandoah Valley Public TV | 8% | 977,725 | 8% | 1,035,146 | 2,012,871 | 13,474,039 | 15% |
| *Greater Washington Public TV* | *0%* | *0* | *14%* | *1,696,370* | *1,696,370* | *2,800,000* | *21%* |
| **TOTAL** | **100%** | **$12,423,218** | **100%** | **$12,423,218** | **$24,846,435** | **$74,539,305** | **33%** |

Notes: Cost estimates utilized are those presented in The Transition to Digital Television of Virginia's Public Television Stations, by Horowitz Television Technology, June 14, 1999. Total estimated conversion costs include only 35 percent ($2,800,000) of the total outstanding conversion costs ($8,000,000) as currently estimated by WETA, as JLARC staff estimate that 35 percent of its viewers are from Virginia. The assumed State funding level is derived from this total cost figure (including only 35 percent of WETA's estimated conversion costs). The percent of station costs met by State funds for WETA is derived from its total outstanding conversion costs ($8,000,000). In areas of coverage overlap, the potential viewer population and the ITV population were divided equally among the stations serving that audience (as it was in the full report for the 11 Virginia stations only).

Source: JLARC staff analysis of locality fall 1998 K-12 enrollment data provided by the Virginia Department of Education, and 1998 population data provided by the Weldon Cooper Center for Public Service.

## Table E

## Illustrative Funding Option 5: Based on a Combination of the Criteria of Equity of Station Resources, Efficiency of Service Coverage, and Degree of Public Service (Including WETA)

### Assumed State Funding Level of: $19,846,262

| Public Television Corporations | Equity of Station Resources (33% of Available Funds) | | Efficiency of Service Delivery (33% of Available Funds) | Degree of Public Service (33% of Available Funds) | | Total State Funding | Estimated Conversion Costs | % of Costs Met by State Funds |
|---|---|---|---|---|---|---|---|---|
| | Funding Related To Ability to Leverage Funds (50%) | Funding Related To Effort to Raise Private Funds (50%) | Funding Related To Number of Transmitters | Funding Related To Potential ITV Population | Funding Related To Potential Population Served | | | |
| Blue Ridge Public TV | $1,325,273 | $523,326 | $1,984,626 | $529,573 | $554,021 | $4,916,819 | $13,448,290 | 37% |
| Central Virginia Public TV | 141,492 | 413,126 | 1,984,626 | 1,676,907 | 1,277,080 | 5,493,232 | 20,538,965 | 27% |
| Hampton Roads Public TV | 510,266 | 1,001,802 | 661,542 | 840,909 | 749,337 | 3,763,856 | 9,277,493 | 41% |
| Shenandoah Valley Public TV | 1,330,680 | 457,536 | 1,323,084 | 260,321 | 275,610 | 3,647,231 | 13,474,039 | 27% |
| *Greater Washington Public TV* | *0* | *911,920* | *661,542* | *0* | *451,662* | *2,025,125* | *2,800,000* | *25%* |
| **TOTAL** | **$3,307,710** | **$3,307,710** | **$6,615,421** | **$3,307,710** | **$3,307,710** | **$19,846,262** | **$59,538,787** | **33%** |

Notes: Funding presented for each column corresponds to the discussion of the individual formulas for each of the three criteria presented previously in this report. JLARC staff assumed one-third of the total illustrative funding amount would be available for each criteria within this combined formula. Cost estimates utilized are those presented in The Transition to Digital Television of Virginia's Public Television Stations, by Horowitz Television Technology, June 14, 1999. The number of transmitters for CVETC is reduced by two as per the discussion in Chapter IV of the full report. Thus, estimated conversion costs for CVETC exclude those costs associated with the conversion of WCVW in Richmond and WNVT in Northern Virginia. Total estimated conversion costs also include only 35 percent ($2,800,000) of the total outstanding conversion costs ($8,000,000) as currently estimated by WETA, as JLARC staff estimate that 35 percent of its viewers are from Virginia. The assumed State funding level is derived from this total cost figure (including only 35 percent of WETA's estimated conversion costs). The percent of station costs met by State funds for WETA is derived from its total outstanding conversion costs ($8,000,000). In areas of coverage overlap, the potential viewer population and the ITV population were divided equally among the stations serving that audience (as it was in the full report for the 11 Virginia stations only).

Source: JLARC staff analysis of station financial statements, wage and salary data provided by the Virginia Employment Commission, personal income data provided by the United States Department of Commerce, Bureau of Economic Analysis, locality fall 1998 K-12 enrollment data provided by the Virginia Department of Education, and 1998 population data provided by the Weldon Cooper Center for Public Service.

## Appendix F

# Responses to the Exposure Draft

As part of an extensive data validation process, the major entities involved in a JLARC assessment effort are given an opportunity to comment on an exposure draft of the report. Appropriate technical corrections resulting from the written comments have been made in this version of the report.

The appendix contains responses from the following:

- Virginia Association of Public Television Stations
- Blue Ridge Public Television, Inc.
- Central Virginia Educational Telecommunications Corporation
- Hampton Roads Educational Telecommunications Association
- Shenandoah Valley Educational Television Corporation

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*Technical Report: Gender Pay Equity in the Virginia State Workforce*, December 1997
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*Review of the Department of Conservation and Recreation*, February 1998
*VRS Oversight Report No. 10: Semi-Annual VRS Investment Report*, July 1998
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*Review of the Use of Consultants by the Virginia Department of Transportation*, November 1998
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*VRS Oversight Report No. 11: Semi-Annual VRS Investment Report*, December 1998
*Review of the Virginia Department for the Aging*, January 1999
*Review of Regional Criminal Justice Training Academies*, January 1999
*Interim Report: Review of the Health Regulatory Boards*, January 1999
*Interim Report: Review of the Functional Area of Health and Human Resources*, January 1999
*Virginia's Welfare Reform Initiative*: *Implementation and Participant Outcomes*, January 1999
*Legislator's Guide to the Virginia Retirement System, 2nd Edition, May 1999*
*VRS Oversight Report No. 12: Semi-Annual VRS Investment Report*, July 1999
*Preliminary Inquiry, DEQ and VDH Activities to Identify Water Toxic Problems and Inform the Public*, July 1999
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*Review of the Performance and Management of the Virginia Department of Health*, December 1999
*Review of the Use of Grievance Hearing Officers*, December 1999

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