
CHAPTER 3

WPTV Turned a Station Into a Network

With little state support, Wyoming Public Television expanded into a statewide network.

On its own initiative, Wyoming Public Television has stretched infrastructure to make its broadcast accessible to most state residents. WPTV has done this with minimal direction or funding from the state: in response to perceived demand from the public, WPTV has expanded its network through formal and informal agreements with private entities. The station's expansion has resulted in a statewide network, but has also created a system with fragile reliability.

Focus on Reliability and Statewide Coverage

WPTV reports on its performance through the Community College Commission.

In assigning WPTV as a program evaluation topic, the Management Audit Committee wanted to know its mission, whether or not WPTV was accomplishing its mission, and how, if at all, the mission had changed over time. Two state agencies have recently examined WPTV's performance with respect to its broad mission. First, the Community College Commission includes WPTV in its strategic plan, and collects information to report on WPTV's performance measures in an annual Strategic Plan Report. Second, the Department of Audit, Public Funds Division, reviewed and reported on WPTV performance measures in 2000.

Our general assessment of these reports is that WPTV is meeting its broad mission, to the extent that data are available to measure this. We determined that our review could best add to legislative understanding of WPTV by focusing on one WPTV performance measure, the extent to which WPTV is providing reliable statewide service.

WPTV Network Cobbled Together

To meet the demand of Wyoming citizens, WPTV expanded from a single public television station to a public television

WPTV's expansion was achieved through bartering and sharing.

network. Typically, a television network does not progress from a station to a statewide network, but rather, begins as a network. WPTV's expansion into a network was accomplished in a piecemeal manner, expanding into new areas of the state as funding and sharing opportunities permitted. To reach most areas of the state, WPTV has relied on cooperation and donations from numerous private businesses and other partners.

WPTV delivers its signal via broadcast and microwave.

WPTV Sends Its Signal Across the State in Two Ways

A brief explanation of how WPTV's system works is necessary to understand the statewide expansion. WPTV delivers its signal from the Riverton production facilities to 20 transmission sites via two means: broadcast and microwave.

A broadcast signal is an over-the-air signal that goes in many directions.

Broadcast. A broadcast signal is an over-the-air signal of strength that lessens with distance. WPTV sends a broadcast signal from its main facilities in Riverton to its only transmitter, located on Limestone Mountain outside of Lander. A transmitter is a tower that uses large amounts of electricity to amplify and broadcast the station's signal over-the-air. After the transmitter picks up the broadcast signal, it amplifies and re-sends the signal as a multi-directional signal with a radius of about 100 miles. WPTV's translators are similar to its transmitter, but of lower power. A translator can also pick up WPTV's broadcast signal and then re-amplify and re-send the signal. The broadcast signal from the transmitter and the translators can be picked up by viewers with antennas and also by other translators. Cable companies can receive WPTV's broadcast signal and feed it into their cable systems.

A microwave signal is point-to-point and cannot be picked up by viewers.

Microwave. Microwave is a high frequency, point-to-point signal of very high quality. From Riverton, the signal goes to Copper Mountain in Fremont County, where it is redistributed by microwave to WPTV's other towers in the state. Viewers cannot receive the microwave signal; it can only be sent to other microwave relay sites. WPTV's microwave signal can be sent to either cable companies or translators. Translators that receive the microwave signal convert the signal into a broadcast signal, which viewers can receive.

WPTV has many different agreements that allowed its statewide expansion.

Cooperation with Private Sector Enabled Expansion

Agreements with and donations from many private sector businesses have allowed WPTV's expansion statewide. WPTV has lease and use agreements with a variety of individual and corporate businesses. In one case, WPTV exchanges the use of its tower with a landowner for the right to build on the landowner's property on Casper Mountain. In other cases, public and private owners of communications towers donate the use of various sites, towers, and buildings to WPTV because of its non-commercial educational nature. One private company estimated the value of the services it donates to WPTV at \$10,410 annually.

WPTV and KTWO share one another's infrastructure.

In addition, WPTV exchanges use of its towers and facilities in one part of the state with KTWO-TV for use of their towers and facilities elsewhere in the state. Thus, WPTV and KTWO share portions of each other's infrastructure, allowing their respective signals to reach parts of the state that they otherwise would not. KTWO uses WPTV's system to reach into the northern part of the state and serve Gillette, Sheridan, and Riverton; WPTV uses KTWO's system to reach the southern part of the state and serve cable providers in Cheyenne and Laramie (see Appendix B).

Expansion Provides Most Wyoming Residents Access to WPTV

An estimated 86 percent of Wyoming citizens can receive WPTV.

The expansion of WPTV's limited infrastructure provides most Wyoming citizens access to WPTV's signal. However, many Wyoming residents also have access to other public television stations. What makes WPTV different from other public television stations is the local programming it provides.

Most Wyoming residents can receive WPTV free of charge.

WPTV Available to Majority of Wyoming Residents

Most Wyoming residents have access to WPTV either through cable or over-the-air. Using information provided by WPTV in conjunction with 2000 Census data and information from local cable companies, we estimate that WPTV is available to 86 percent of the state's population. Furthermore, most Wyoming residents have access to WPTV's over-the-air broadcast signal free of charge.

Wyoming residents with satellite television likely do not receive WPTV.

However, there are limitations to our estimate. While 86 percent of residents may have access to a WPTV signal, this does not mean that the same percentage of the population actually takes advantage of the WPTV signal available to them. For example, an estimated 20 percent of Wyoming residents receive their television signal via satellite. A public television station such as WTTW from Chicago is likely available to them via satellite. Should these residents wish to tune into WPTV, they would either need to access its over-the-air broadcast by antenna, or purchase a cable subscription in addition to their satellite service.

Through cable, many Wyoming residents receive other public television stations.

Residents Often Have Access to Other PTV Stations

Many Wyoming residents have access to public television from neighboring states, such as KRMA from Denver, Colorado. Using the methodology described above, we estimate that 54 percent of Wyoming residents have access to another public television station through cable. Additionally, some residents who live near Wyoming's borders have over-the-air access to other public television stations.

Nevertheless, some residents rely on WPTV as their only public television station. Of all Wyoming residents, 37 percent reside in areas where WPTV is the only public television station offered by their cable provider. Without WPTV, these residents would likely not have access to a public television station, unless they have satellite access.

Only WPTV offers programs that are particular to Wyoming.

WPTV Provides Residents with Local Programming

Although public television stations are available to many residents, WPTV is the only public television station that produces and airs Wyoming-specific programming. While WPTV's local programming currently accounts for only one percent of its total air-time, these programs are relevant to Wyoming residents in ways that out-of-state productions are not. For example, WPTV programs include candidate debates for local, state, and national offices, as well as educational productions specific to Wyoming such as *Wyoming's War on Meth.* (See Appendix C for more examples.)

Stretching Statewide Results in Fragile Network Reliability

Numerous factors affect reliability of WPTV's broadcast.

In stretching limited resources to achieve statewide coverage, the reliability of WPTV's system became fragile. When compared with the infrastructure that supports public television networks in several neighboring states, WPTV's network is thin. While WPTV reports their system has been generally reliable, we identified numerous factors that could affect the station's ability to maintain its statewide broadcast. These factors include old equipment, few backups or system redundancies, minimal staffing levels, lengthy response times to service interruptions, as well as harsh environmental conditions at remote tower locations. Some of these system weaknesses can be remedied by purchasing new equipment, while others are simple realities of the Wyoming environment.

The station has relied on salvaged parts to keep the equipment running.

Outdated Equipment Unreliable

Overall, WPTV's equipment is old and unreliable, with much of it about 20 years old. The station has relied on salvaged parts to keep the equipment running. New equipment the station is purchasing in conjunction with the conversion to digital should increase the system's general reliability, as digital equipment is inherently more reliable.

The breakdown of one tower could affect much of the network.

No Backups or Redundancy in WPTV System

The lack of backup systems and redundancy built into WPTV's system causes additional difficulties. If equipment breaks down, the system is often down until it can be repaired. This is further complicated by the configuration of WPTV's system: the WPTV transmitter and translators operate in a manner called daisy-chaining that is much like a traditional string of Christmas lights. Thus, if one tower goes out, all the towers after it also go out.

"First responders" near towers assist WPTV.

Limited Staff and Environment Limit Response Time

With a limited staff, all WPTV employees have multiple job responsibilities, and with no depth to cover illness and vacation time, the staff's ability to fix a problem quickly is challenged. To alleviate this problem, WPTV has arrangements with "first-responders" near many of their towers. Often the only problem at a tower is that a power circuit has been tripped. It may take a

at a tower is that a power circuit has been tripped. It may take a WPTV engineer all day to drive to a site far from Riverton, whereas a volunteer or paid first-responder can sometimes get there and fix the problem in a matter of hours. However, if the first-responder is not available, a WPTV engineer must travel to the site, which can seriously affect response time.

Weather conditions can affect response time to service interruptions.

Response time increases in the winter as weather conditions worsen because towers are built where they are the most effective, which is generally on mountaintops. A trip that may take only a few hours in good weather may take days in the winter, since some sites are only accessible by Snowcat.

WPTV differs from surrounding public television stations in that it has only one transmitter.

WPTV Has an Atypical Network

While a typical public television network consists of several strategically placed transmitters, Wyoming's statewide network has only one transmitter. In other words, WPTV uses one transmitter and many translators to deliver its signal around the state. Typically, networks tend to rely on several transmitters, or main "stations," licensed by the FCC to get their signal to viewers. For example, Nebraska Public Television has nine transmitters; Idaho Public Television, five; and Montana Public Television, which is not statewide, two. With only one transmitter to rely on, WPTV's network differs significantly.

Some public television stations relay their signals via satellite.

Some public television networks, such as Nebraska and Alaska, also use satellite to relay their signal to the network's system of transmitter and translators. The network's main signal is sent to a satellite and then relayed to the network's towers. With broadcast, one tower must be within a direct line of another tower to receive the signal, whereas with satellite, towers do not rely on line-of-sight to receive a signal and can therefore be placed wherever they serve the largest number of people.

Wyoming Public Radio (WPR) uses a satellite to relay its radio signal at a cost of roughly \$20,000 per year. However, a WPR official noted that it would take up to 100 times more bandwidth to send a television signal than a radio signal. This cost would likely make satellite transmission far beyond WPTV's financial capabilities.

WPTV Expanded on Its Own, While Funding Lags Behind

With little state support or direction, WPTV expanded from a small station into a statewide network.

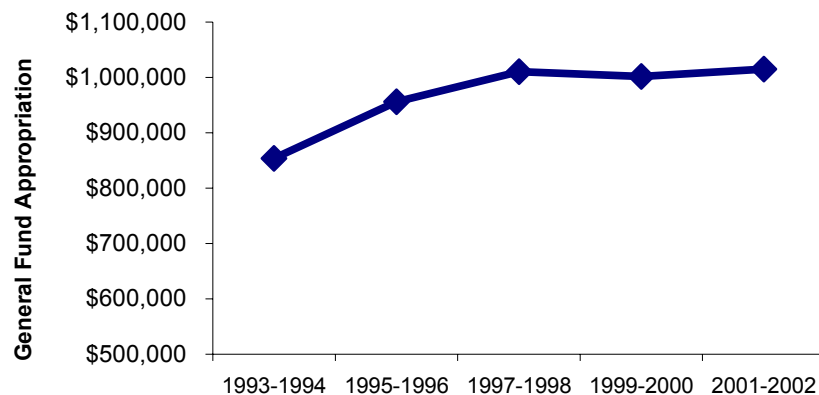
In less than 20 years, WPTV has been able to expand from a small regional station to a statewide network. Responding to demand by Wyoming residents, station personnel capitalized on available resources and forged partnerships with private businesses to build a network on a shoestring. This expansion has been accomplished without legislative direction and despite minimal state funding. Surrounding states, we learned, have supported their public television networks to a greater degree with funding and infrastructure.

State funding has remained static.

WPTV Funded as Station, Not Network

WPTV has not obtained funding for what it has become — a network, reaching most of the state. Since FY 1993-94, when WPTV was first included in the Commission's budget, state appropriations for WPTV's operations, including utilities, insurance, and staff salaries and benefits, have increased 19 percent. However, when adjusted for inflation, this state-provided funding is less now than it was then.

**WPTV Standard Budget Appropriations:
1993 - 2002**



Source: LSO Analysis of Budget Documents

WPTV requested supplemental funding for infrastructure development twice in the last decade.

In addition to standard budget requests for operational expenses, WPTV has requested supplemental funding from the Legislature for infrastructure twice during the past decade. During the 1995 Session, WPTV requested and received \$130,000 in supplemental funding for the replacement of outdated equipment. In 2001, WPTV estimated it needed \$1.6 million in supplemental funding to begin digital conversion. While the budget request submitted by the Governor contained no funding for this, the budget put forward by the Joint Appropriations Committee did include funding. The Legislature eventually appropriated \$1 million for WPTV to begin the conversion.

Combined, the station's other revenue sources (federal and private funds) have also remained relatively constant since FY 1996. Together, private and federal funds are roughly equal to the state's annual contribution to WPTV (see Appendix D).

Other states play more active roles in funding public television.

Neighboring States' Commitment to Public Television

WPTV receives roughly one half million dollars per year from the State of Wyoming, but we learned that surrounding states play a more active role in funding their public television stations. Of the four surrounding states we examined, all receive larger contributions from their respective states, with most receiving significantly more funding. For example, Idaho Public Television receives \$1.7 Million in state funding each year. Montana Public Television receives slightly more than WPTV each year (\$540,000 in 2001), to provide public television access to about 40 percent of the state's population (see Appendix E).

Some states allow public television to use the state's infrastructure.

In addition, some states allow their public television stations to use portions of the states' telecommunications infrastructure to transmit their signal across the state. Idaho Public Television uses the state's newly constructed digital microwave system to relay its signal to much of the state.

Recommendation: WPTV should present the Legislature with the information necessary for prudent decision-making regarding the future of public television in Wyoming.

WPTV is at a crossroads with respect to its future.

WPTV has built a statewide network, taking tacit legislative support from continuing minimal appropriations. However, with the impending digital conversion, WPTV is at a crossroads with respect to its future. As discussed in Chapter 2, WPTV will likely need additional state funding to continue providing its signal statewide, and it needs to ensure that the Legislature has an understanding of this cost.

WPTV must demonstrate its value to the Legislature in order to gain state support.

To this point, WPTV has scrounged and traded to expand its service area on its own. This puts WPTV in the position of having to seek greater commitment from the Legislature for a program it has not officially authorized. Now, WPTV must take steps to get this commitment by demonstrating to the Legislature its value to the state. WPTV may also, as discussed in Chapter 1, ask the Legislature for statutory direction with respect to how it uses its resources.

The Legislature saw value in Wyoming Public Radio and in 1996-1997 provided funding to make it available statewide. The Legislature should determine whether or not it wants the same for Wyoming Public Television, once WPTV provides the necessary information to make an informed decision regarding the future of public television.