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B.A., English, (Communication Arts-Media Studies) Waynesburg College, Waynesburg PA.	1989
Program Director Mountaineer Doctor TeleVision.	September 95-Present
Systems Analyst.	February 94-September 1995
Waynesburg College Assistant Director/Media Services.	1992-1994
Television News Producer WTOV-TV Steubenville, Ohio.	1991-1992
Television News Producer WCIV-TV Charleston, South Carolina.	1989-1991

- Independent Videographer for numerous clients including:
  - CBS Sports • CNN• ESPN
  - KDKA-TV, WTAE-TV, WPXI-TV in Pittsburgh PA.
  - WTRF-TV, Wheeling WV• WTOV-TV, Steubenville, Ohio.
  - WBOY-TV and WDTV-TV, Clarksburg WV
  - WCHS-TV, Charleston WV.

- Remote Video Production Engineer for clients including:
  - KDKA-TV Pittsburgh, PA.
  - KBL Sports, Pittsburgh, PA.
  - WIVB-TV, Buffalo, New York.

- Adjunct Lecturer, Waynesburg College, Waynesburg PA. 1992

- Instructor for CBS & ESPN Sports Commentator
  Bill Raftery's Sports Broadcasting Camp. 1991-1994

MDTV Mountaineer Doctor TeleVision

Background

The Robert C. Byrd Health Sciences Center (RCB HSC) of West Virginia University has a strong history of telecommunications activity that enhances its support of rural physicians and improves the quality of care offered statewide.

In 1985, a highly successful telephone (audio only) medical information service was developed to provide rural physicians access to the medical resources available at the RCB HSC. The Medical Access and Referral System (MARS) is a toll-free 24-hour-per-day service that instantly links rural community physicians to the WVU specialists, including its medical specialists or subspecialists and its many ancillary services and special care centers.

This tradition of outreach to rural physicians extends beyond phone contact to include site visits, meetings with rural hospital medical staffs, and outreach educational lectures. With such strong culture of communication with rural physicians already in place, MDTV was the next logical step to extend this commitment to video communication.

MDTV Network Description

This two-way compressed video communications network allows rural hospitals and physicians throughout West Virginia nearly instant access to the medical, educational and technological resources of the hub sites. Using T1 telephone lines, MDTV provides rural West Virginia physicians with state-of-the-art interactive communications with hub site specialists. Once a part of the network, sites can communicate in point-to point or multi-point configurations.

Cameras and monitors at each site permit 24-hour-per-day video communication for patient medical consultations, emergency assistance, CME programs, student and resident educational programs, and other services. MDTV technology permits the transmission of images, such as X-rays, and superb audio for the transmission of heart and lung sounds through electronic stethoscopes.

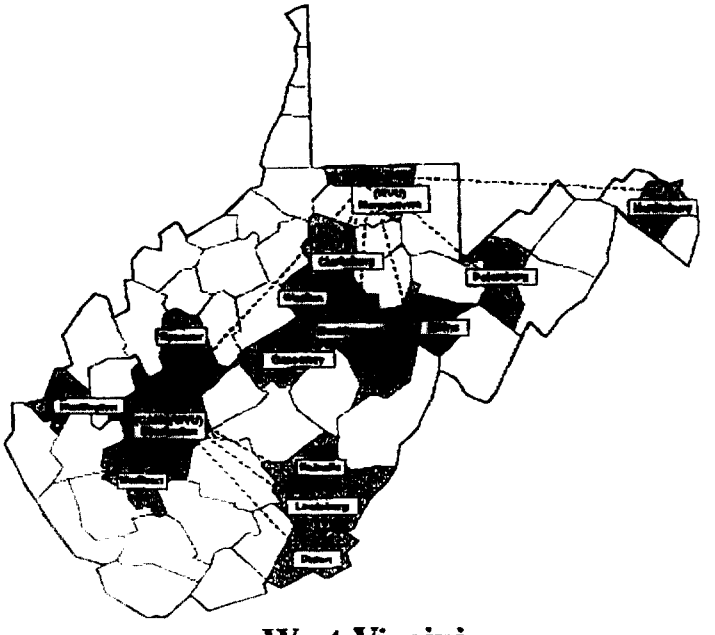
With the network in place, MDTV allows many patients to have access to sub-specialty care while remaining in their local communities. MDTV also supports the opportunity for training medical personnel in rural areas by supplying a link with medical, nursing, and other health professions students to their professors at the academic medical centers. MDTV is expanding its continuing educational programs to include all health care disciplines. Continuing education programs in Nursing, Radiological Technology, Microbiology, Pharmacy, Dentistry, have all been developed to better serve the continuing education needs of West Virginia's rural providers.

New programs are being developed for Medical Records personnel, PT, RT, Dietary & Nutrition, Maintenance Engineering, Pathology, Social Services, and Patient Services and Billing Office personnel. With increased demands and shrinking resources for continuing education across the state, MDTV hopes to become a major provider for those health care disciplines requiring accredited continuing education for recertification.

Site Description

MDTV is a hub and spoke concept network which links West Virginia's Academic Medical Centers to rural hospitals around the state. The first hub site at the RCB HSC in Morgantown supports Grant Memorial Hospital in Petersburg, Davis Memorial Hospital in Elkins, St. Joseph's Hospital in Buckhannon, and the VA Medical Centers in Clarksburg and Martinsburg.. The Charleston Area Medical Center (CAMC), in conjunction with the Charleston Division of the RCB HSC, has developed a second hub site which supports facilities located in southern West Virginia including Boone Memorial Hospital in Madison and Braxton County Memorial Hospital in Gassaway, Raone County General in Spencer, the School of Osteopathic Medicine in Lewisburg, and Federally designated Community Health Centers in Raincle and Union.

For More information Call (304) 293-6926



West Virginia

ROBERT C. BYRD HEALTH SCIENCES CENTER
OF WEST VIRGINIA UNIVERSITY

SUMMARY OF PRESENTATION BY ROBERT PENNINGTON, PROGRAM DIRECTOR REPRESENTING THE TELEMEDICINE PROGRAM MOUNTAINEER DOCTOR TELEVISION (MDTV). ROBERT C. BYRD HEALTH SCIENCES CENTER OF WEST VIRGINIA UNIVERSITY

TO

FEDERAL-STATE JOINT BOARD ON UNIVERSAL SERVICE
FEDERAL COMMUNICATIONS COMMISSION
REGARDING
"FUNCTIONS AND COSTS OF TELECOMMUNICATIONS SERVICES FOR RURAL HEALTH CARE PROVIDERS"

JUNE 19, 1996

I. IDENTIFICATION OF TELECOMMUNICATIONS USERS:
- NON-PROFIT ORGANIZATIONS.
- HOSPITALS.
- CLINICS.

II. FUNCTIONAL REQUIREMENTS:
- SERVICES DELIVERED BY RURAL HEALTH CARE PROVIDERS.
- BANDWIDTH REQUIREMENTS OF HEALTH CARE PROVIDERS.

III. COST OF BANDWIDTH:
- CURRENT TELECOMMUNICATIONS COST.
- RURAL VS. URBAN TELECOMMUNICATIONS COST.

IV. RECOMMENDATIONS FOR IMPLEMENTATION OF SERVICE.

MD TV Mountaineer Doctor Television
PO Box 9080 Morgantown WV 26506-9080

Comments to Federal State Joint Board on Universal Service
Federal Communications Commission

Ladies and Gentlemen thank you for the opportunity to address the joint commission. A little background on the program at West Virginia University. The Mountaineer Doctor TeleVision program or MDTV as its known is two way audio and video link to small rural hospitals and clinics as well Veterans Administration hospitals and the states 4 academic medical centers. By using this link, physicians are able to see patients in their home communities, Health Care professionals in rural areas are able to continue their education and take advantage of the resources available at academic medical centers. Smaller facilities are able to recruit quality personnel because the professional isolation associated with being located in a rural area is reduced by this technology.

You will notice that all of the facilities that I have mentioned are not for profit organizations. As we discuss the functions and costs of telecommunications services for rural health care providers, I encourage you to develop functional and cost requirements specific to these users. Rural non-profit hospitals have unique roles in their respective communities, many are the largest employers in their area. The use of the technology I described is one way to assist these facilities in providing a valuable service in their area. By the use of the technology I described, an inpatient may be able to receive their medical care in their home community, where it is less expensive and less disruptive to the patient and their families. Keeping patients in these smaller facilities help these facilities survive in a competitive environment.

Some of the countries small rural health clinics are also providing a valuable service to their communities. In West Virginia, the patient volume at some of the non profit clinics rival that of some of the small hospitals. The use of telemedicine technology allows many of the patients serviced by these clinics to remain as outpatients, saving resources and valuable health care dollars.

I have described briefly the technology of telemedicine, most every state has some form of telemedicine effort under way. The type of technology ranges from two way full motion audio and video such as the MDTV program in West Virginia, to a one way video connection taking place via a desktop computer. The area of teleradiology is becoming a more common use of the telecommunications infrastructure being developed across the United States. As the technology progresses at a feverish pace, many applications are now being delivered into the home. Post operative monitoring, medication compliance and fetal monitoring are just a few of the applications being used in the home,utilizing a telecommunications link.

While technology to allow the delivery of quality health care to the most remote regions is progressing, many times the infrastructure prohibits the technology from being implemented. Lack of service and cost prohibitive service are two common problems that impede expansion of such technologies.

Currently the MDTV program at West Virginia University utilizes T-1 technology, that equates to 1.544 Megabits per second. That type of bandwidth affords our program a quality video image, many of the physicians I have consulted with... consider this amount of bandwidth the minimum needed to conduct medicine. To give you a gauge, many of today's videoconferencing systems use 384 kilobits per second, a fourth of the T-1 rate. It is understandable why the 384 kilobit speed became a standard for videoconferencing.... Namely price.

The MDTV program currently supports telecommunication cost approaching a quarter of a million dollars a year. Their are 14 sites on the network... and the average telecommunications charge is $1300 per month per site. The program is supporting these charges with the help of grant funds. Without these funds, many of the smaller facilities on the network would have difficulty in supporting a telecommunications charge of over $12,000 a year.

I suggest that the minimum bandwidth requirement for health care usage become the 1.544 Megabit per second standard. This bandwidth could be provided through dedicated lines or through the usage of ISDN service.
I do disagree with the current proposal to discount telecommunications usage for rural areas based on the urban area pricing. A number of different factors keep the urban/rural usage fee from being practical. I have provided these comments to the Federal Communications Commission in Docket No. 96-45.

service, depending on the functionality required, may have little to do with size of school, e.g., number of students.

Functionality, rather than specific technology, must be the goal of this effort. The notion of ' appropriate technology' should be adopted, that is, the least technology which meets the functional educational or informational requirements of a school or library should be implemented.

It is imperative that broadband tariffed rates include the **option for leasing transmission equipment** in addition to leasing the transmission line. To ask a consortium of small schools to own or maintain high-end switching or transmission equipment, e.g., codecs, MCU's, etc., is akin to asking schools interested in instruction by satellite to launch their own satellite. A particular telecommunications provider with whom I am now negotiating on behalf of two clusters of rural districts fully intends to exclude any such offer from their pricing estimates. Unless by divine intervention, those schools will have no opportunity to share a College Prep English teacher or provide their students with advanced foreign language. They have neither the funds to purchase nor the means to maintain the codecs or quad-split MCU, even if the price for a T-1 pipe was affordable.

Telecommunications services used for distance learning must allow for and include optional pricing for **interconnectivity**, i.e., gateways, across carriers and across technologies. Without such safeguards assuring the opportunity for interconnectivity, the telecommunications highway linking rural communities will end as dead-end roads, or in urban America as cul-de-sacs.

Professional development for teachers in the use of technology and the purchase of classroom equipment--while serious needs--fall outside the domain of this proceeding. Connectivity, not basic equipment or training, is the issue. The central focus of the Universal Service Fund should be on providing assistance with the installation and ongoing operational costs of those telecommunications services required by the end user.

Technology should be seen as a **means to achieve greater equity in education and information access**. We should not utilize this process as a means of achieving technological parity. Any singular national goal, e.g., bringing Internet access to every school desk, will overshadow and leave unaddressed all of the other legitimate telecommunications needs of

schools and libraries. We must insure that the USF is used to meet the telecommunications needs of schools and libraries, whether that be in the provision of direct instruction, (e.g., distance learning), in accessing information and library resources,(e.g., Internet access), in providing educational enhancement opportunities, (e.g., e-mail), or for administrative purposes, (e.g., allowing student records to expeditiously follow the child). Equity of access, not parity in technology implementation should be the goal.

Given that it is cheaper to transport information than it is to transport people, the cost of telecommunications access for schools and libraries must be weighed against the far greater cost of lost educational opportunity. Grundy County R-V in Galt, Missouri, with a high school student body of 113, has few options for increasing its access to the outside world beyond the opportunity afforded by telecommunications technology. Because it happens to be served by a progressive small, independent telephone company, students in Galt and three of its neighboring districts will now be able to meet the admission requirements of the University of Missouri at a price commensurate with their need.

Through telecommunications technology, both the intentionally small school and the "necessarily existent" small school can retain their size-related assets and still compete with their larger school counterparts in breadth of curriculum and opportunities afforded to their students.

Telecommunications services should come at a price--**services should not be free**--but that price should be adjusted according to each service provided and at an affordable level. Pricing should mirror the marketplace--an analog distance learning link should cost schools more than a fractional T-1 data line. Therefore, the honesty of the marketplace will encourage schools to adopt only what they need and only that which can be economically justified.

The existence of predictable, affordable access to telecommunications services across the nation is an **investment in the future**. Historically, the greatest economic contribution of rural America to the nation's economic growth has been the production of an educated workforce which it has largely exported to the urban workplace. With the advent of widespread access to telecommunications services and the enhanced economic opportunity it can stimulate, the outmigration of the best and brightest

need no longer be necessary in order for them to reach their employment and income potential. An investment in telecommunications in schools and libraries is concurrently an infrastructual investment in the business and economic community and therefore in the potential for market expansion.

You are aware of the cost estimates for ubiquitous deployment of the so-called Information Highway--while disparate, all point to high price tags. In the widely cited Kickstart Initiative the cost of initial and annual operations to the classroom is placed between $2.34 and $3.12 billion annually (depending upon a 5- or 10-year deployment schedule). My recommendations undoubtedly would place total cost to the USF markedly under those estimates. Several factors mediate the cost and inhibit the size of the Universal Service Fund required: (1) the non-ubiquitous deployment of any telecommunications service; (2) the restriction of covered services to installation and operational costs; (3) the positioning of schools and libraries as legitimate telecommunications consumers; (4) the gradual deployment of services based on individual school district and library requests; and (5) the implementation of the least and most appropriate technology which meets the functional requirements of the adopter.

Mobilizing the collective opportunities of federal and state agencies involved in the allocation and distribution of technology funds will help to insure that the poorest districts can participate in this program. While the USF cannot possibly absorb all costs associated with telecommunications technology adoption, this initiative can encourage the direction of other federal and state funds toward a common, integrated purpose.

Biography

Adam M. Golodner

Adam Golodner is the Deputy Administrator of the Rural Utilities Service (RUS). The Rural Utilities Service is a policy, planning and credit agency within the United States Department of Agriculture. The Rural Utilities Service focuses on rural infrastructure and economic development. The agency is charged with developing and maintaining electric power, telecommunications, and water and wastewater systems throughout rural America. The Rural Utilities Service directs a $45 billion loan portfolio in the areas of electric power, telecommunications and water and wastewater.

Prior to joining the Clinton Administration in April of 1993, Mr. Golodner practiced law in Denver, Colorado, where he was a partner with a major law firm. Prior to assuming his position with the RUS, Mr. Golodner worked in the White House and as a Special Assistant to Department of Agriculture Under Secretary for rural development, Bob Nash.

Mr. Golodner is one of the Department of Agriculture's representatives on the Vice President's National Information Infrastructure Task Force and serves on the Telecommunications Policy, Applications and other working groups of the Task Force. He is also a non-voting member of the Communications Committee of the National Association of Regulatory Utility Commissioners.

4/96

Executive summary of testimony of Adam Golodner
Deputy Administrator, Rural Utilities Service
June 19, 1996 Joint Board Meeting

- This country has approximately 3,000 counties, 2,100 of which are rural and 1,400 of these rural counties have been Federally designated as health care professional shortage counties.

- Unlike the Act's education provision which affects all of America, the health care provision is addressed solely to the challenge of rural health care.

- Over the last three years, RUS infrastructure loan funds have been used to drop fiber at the door of hundreds of clinics and the RUS Distance Learning and Telemedicine Program has provided 33 grants for rural telemedicine. These grants were used to help create community partnerships to purchase equipment at 112 sites, affecting 134,000 patients in 23 states.

- The service functions rural health care providers demand include the following:

  - Initial patient evaluation, triage and transfer arrangements
  - Transmission of diagnostic images
  - Medical and surgical follow-up and medication checks
  - Primary care at sites where a physician is not available
  - Consultations and second opinions
  - Extended diagnostic work-ups or short term management
  - Management of chronic diseases and conditions requiring a specialist not available locally
  - Transmission of medical data
  - Continuing education for physicians and practitioners
  - Public health, preventive medicine, and patient education

  Rural health care providers also want access to the internet at rates comparable to local dial-up rates.

- Comparing these service functions on an urban to rural basis requires defining the characteristics of comparability. For health care, we must compare useful medical function to useful medical function. Let's examine a consultation between a general practitioner with a patient and a specialist. An urban telemedicine consultation contact would most likely require a telecommunications carriage of a few miles. That same rural use, from a rural practitioner with a patient to a specialist, may require a 200 mile trip.

- When user functionality is included in the issue, it is clear rural costs exceed urban costs. The bulk of the facilities used for telemedicine are ordinary telecommunications facilities. As other panels have discussed, rural areas are high-cost areas.

- From our experience with rural telemedicine, the most desired service is interactive video. As a rule of thumb, 6 Mbit/sec. compressed video appears comparable to broadcast quality video and 1.5 Mbit/sec video appears comparable to VCR quality. Video can be sent at rates as low as 56 Kbit/sec but it has clear flaws in color and sharpness and is jerky.

- Rural rates are higher than urban rates. The methodology for comparing rates, however, is not easy. The costs of these services are generally guided by state and federal tariffs, often determined through negotiation. There is no standard or uniform approach, and approaches vary from state to state. Further, a number of rural telecommunications service providers already discount telemedicine services as a community service.

- The RUS has surveyed rates experienced by rural telecommunications service providers and telemedicine grant recipients and has found six states where direct comparisons between urban and rural rates can be made. Listed below are cost figures and annual cost differences. Please note that we used sample rural routes that approximated 100 miles or less (no worst cases), and for our annual cost comparisons we assumed 100 hours per month of use and 100 mile distance from a metropolitan center:

Comparison of Circuit Costs

		Installation	Fixed Monthly	Per use
Colorado				
T1				
	Urban	$372	$1072	Dedicated
	Rural	1758	3934	Dedicated

Annual cost difference per T1: $31,638

Minnesota				
T1				
	Urban	625	365	$15/hr.
	Rural	625	1158	$42/hr.

Annual cost difference per T1: $41,916

Montana

T1

Urban	1200	216
Rural	1200	1187

Annual cost difference per T1: $11,652

Oklahoma

T1

Urban	($16.80/mile plus $165/channel)
Rural	($25.10/mile plus $198/channel)

Annual cost difference per T1: $24,912

Texas

T1

Urban	$268 monthly
Rural	1358 monthly

Annual cost difference per T1: $13,080

Washington

ISDN Basic Rate

Urban	129	81	$.53/min.
Rural	623	475	$.53/min.

Annual cost difference per ISDN BRI: $5,221

- At RUS' request, the National Exchange Carriers Association (NECA) provided a national average rate comparison based on August 1995 filed rates for a DS1 (T-1) circuit for urban companies (RBOCs, GTE and United) and small rural company members of NECA. An average urban telemedicine user located 30 miles from a metropolitan center would pay $984 per month for the same service that a rural user located 100 miles from a metropolitan center would pay $3140 per month to use (if the rural user is located 300 miles from the metropolitan center, its cost would be $8160 per month). **The annual cost difference between the rural 100 mile circuit and the urban 30 mile circuit is $25,872.** This figure is generally consistent with the six state survey above, and, arguably, could give some indication of an average per site differential nationally.

- If internet connectivity is deemed to be part of the supported service functions, the

difference between toll rate connectivity and connectivity at a local call rate must also be included in a national cost calculus

- Cost? That question is hard to answer. The Act requires a state by state balancing of rates and the rates vary greatly state by state. Further, there are over 2800 rural health clinics in the country and we do not have a clear idea about how many will request telecommunications services under the provision, or at what service level. Finally, the field of telemedicine is addressing major issues regarding insurance reimbursement and licensure, the outcome of which will surely affect demand.

- Having said that, one could extrapolate a figure by estimating demand and using a RUS/NECA conservative average yearly cost differential per site of approximately $25,000. The RUS does not specifically endorse that figure, but simply shares its experience and method.

- This figure, and any current cost, will also be effected by other provisions of the Act. If universal service "core services," or the "advanced services," or the "infrastructure sharing" provisions of the Act lead to switched broadband service in rural areas, or even unloading loaded loop -- the rural telemedicine specific costs will go down. If competition drives down urban prices, but competition does not come to rural areas or prices otherwise do not fall, the cost disparity for these services, and thus the universal service cost, will go up. In the long run, however, both urban and rural costs should come down as the network infrastructure advances.

- In a macro sense, these telemedicine costs are off-set by the savings to the economy from the provision of quality health care close to home: preventive care in the community; fewer critical care cases; less travel time and expense; fewer worker-hours lost; and, of course, lives saved.

- Conclusion: The rural need is clear. The Act's direction is clear. The functions required can be defined. The RUS believes that for purposes of determining reasonable comparability, the services must be compared on a useful function to useful function basis. This comparison shows that rural rates are multiplies higher than urban rates on a yearly basis and that universal service credits can create comparability.

Biographical Information

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Personal

50 years old
Married
Four children
Three grandchildren

Business

30+ years in the telecommunications industry.

Southwestern Bell Telephone Company
Oklahoma City
17 years
Network marketing/sales, sales management

AT&T
Oklahoma City
13 years, joined AT&T at divestiture, retired April 1996
Network and Product marketing/sales, sales management

Chickasaw Telephone Company
Oklahoma City
April 1996
Director, Technical Services

Oklahoma Telemedicine Network

Description

The network was made possible as a result of a grant obtained by the University of Oklahoma Department of Commerce and coordinated by the University of Oklahoma Health Sciences Center, the teaching hospital for the University of Oklahoma. The network is administered by Medical Technology and Research Authority (MTRA).

The network was submitted for competitive bid with the winner providing a complete, turn-key system; including all equipment, computers and video equipment. The successful bidder was Computer Professionals, Inc. (CPI), Tulsa, Oklahoma.

After the receipt of the award, CPI turned to the various IXC carriers to provide the actual physical network. The private fiber providers in Oklahoma (the affiliated companies of the independent telephone companies in Oklahoma) responded to the request. Indian Nations Fiber Optics, Inc. and Dobson Fiber were selected as the primary network contractors to MTRA/CPI for the telecommunications infrastructure.

The objective of the independent fiber providers and the independent telcos in participating in telemedicine was to bring quality healthcare services to rural Oklahoma. That philosophy tied in directly to the goal of telemedicine; "to treat the patient at the hospital at the most inexpensive point of care, while maintaining the highest quality of care"

The original network was to connect thirty-eight (38) hospitals, soon it will be growing to forty-six (46) facilities, across the state. The network has four (4) primary hub sites; Oklahoma City, Tulsa, Lawton and Guymon, connected by DS-3's, ATM switches and "smart" routers. The hospitals are connected to the closest hub site.

The network is designed to provide data, video and Internet connectivity to the hospitals. Applications include:

- -Radiology
- -Cardiology
- -Pathology
- -Dermatology
- -Ophthalmology
- -Neurology
- -Oncology
- -Psychiatry

Benefits realized from the network include:

- Fewer cases need to be referred to regional medical centers.
- Allows specialty-rich health care organizations like the University of Oklahoma Health Sciences Center to export expertise to those areas who are without specialty expertise.
- Reduces transportation costs.
- Lowers tertiary care costs.
- Provides greater convenience to patient and allows patient to remain closer to their primary care provider and closer to home and family.
- Since a primary emphasis of telemedicine is to improve early diagnosis and treatment, the cost of healthcare should be less.
- Video capabilities allow a mechanism to provide continuing medical education.
- Reduces the sense of professional isolation of rural primary care physicians.

<u>Costs</u>

Because independent fiber providers were able to provision the service, each institution saved, on average, $5500.00 per month as compared to existing tariff rates.

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What's next?

Telemedicine will probably be connected to the State of Oklahoma's OneNet system. Providing more access at even lower costs.

OUTLINE OF PREPARED REMARKS

Background and overview of the Oklahoma Telemedicine Network

- Network established from funds obtained by the Oklahoma Department of Commerce.
- Administered by Medical Technology and Research Authority of Oklahoma (MTRA).
- Network was established as a result of competitive bids which included all equipment.
- Independent fiber companies, affiliated with independent telcos, responded and were awarded contract as network providers.
- The objective is to provide quality healthcare services in rural Oklahoma. The overall goal of the network is to treat the patient at the hospital at the most inexpensive point of care while maintaining the highest quality of care.
- Original network connected 38 hospitals, with 8 additional coming on line within the next 30 days.
- Network has 4 primary hub sites; Oklahoma City, Tulsa, Lawton and Guymon connected via DS-3's, ATM switches and "smart" routers. Hospitals are connected via DS-1's.

  Applications include:

  -Radiology
  -Cardiology
  -Pathology
  -Dermatology
  -Ophthalmology
  -Neurology
  -Oncology
  -Psychiatry

- Benefits realized from the network
  - -Fewer cases need to be referred to regional centers
  - -Allows the export of specialty rich health care organizations to rural institutions without that specialty.
  - -Reduces transportation costs
  - -Lowers tertiary care costs
  - -Provides greater patient convenience
  - -Improves early diagnosis
  - -Video allows transport of continuing education
  - -Reduces sense of professional isolation of rural primary care physicians.
- Costs
  - -On average, each institution saved $5500.00 by utilizing the pricing offered by the independent fiber providers.
- What's does the future have in store.
  - -Connection to OneNet, a state-wide video data network.
  - -Affordable transport to meet the application needs.

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Bill Welch has been the President of the Nevada Rural Hospital Project (NRHP), the voluntary consortium of Nevada's twelve rural hospitals, for four years. Prior to the position of President, Mr. Welch had been active as Chairman and Board member since NRHP's inception in 1987. Mr. Welch has been an extremely active advocate for health care, specifically rural health care, since he became administrator of Elko General Hospital in 1977. He has served on many local, state and national boards and committees. Most recently, Mr. Welch was elected to the National Rural Health Policy Board and attended the American Hospital Association Annual meeting as a representative for Nevada.

NRHP's goals are improving quality of care; increasing access to quality care and improving financial viability for its rural hospital members. Mr. Welch believes that telemedicine will assist the members in obtaining these goals. Mr. Welch has been a proponent of telemedicine since 1988 when NRHP established the Nevada Rural Hospital Teleradiology Network for nine of Nevada's rural hospitals. Mr. Welch has continued this support by coordinating and integrating two separate grant efforts to provide telemedicine and distance learning to sixteen remote rural communities throughout Nevada. Mr. Welch has done extensive research on the technology and capabilities necessary for providing telemedicine. Mr. Welch is currently working with a number of Nevada hospitals, providers and agencies to coordinate a statewide telemedicine conference

INTRODUCTION

Bill M. Welch, President, Nevada Rural Hospital Project (NRHP)

PRESENTATION

Function and Cost of Telecommunications Services for Rural Health Care Providers

REMARKS

- Based on NRHP experience in developing and implementing a teleradiology network, an ADN degree interactive distant learning program and a telemedicine program in rural Nevada.

WHO IS NRHP?

- Voluntary consortium of Nevada's twelve not-for-profit, public, sole community, rural hospitals.
- Range in size from Caliente's 4-acute/16-LTC hospital to Carson City's 124-acute bed hospital
- Services include
  - outpatient emergency
  - inpatient acute
  - surgery
  - nursing home
  - varying diagnostic functions
  - hospital-based physicians
  - home health
- Service area covers approximately 93,000 square miles which is 80% of Nevada's territory
- Service population is 246,345+ which is 20% of Nevada's population

(exhibit 1)

NRHP TELEMEDICINE/INTERACTIVE DISTANT EDUCATION FUNCTIONS

- TELERADIOLOGY

Function: Diagnostic interpretation service for emergent patients utilizing standard X-Ray/CT functions

Equipment: PC-based with installed video camera and boards over basic telephone line

Equipment Cost: Approximately $20,000 including site preparation (today's cost)

Transmission Line Need: Copper line or fiber optic access which is much faster and reduces transmission cost

Transmission Cost: Vary from community to community based on telephone services
Average transmission time is 10 minutes
Range of $1.13 to $3.16
Example:

	RENO to ELKO		ELKO to RENO	
	1st	Add min	1st	Add min
Day	46¢	30¢	27¢	25¢
Eve	35¢	23¢	19¢	17¢
11-8	23¢	15¢	14¢	11¢

(exhibit 2 -- map)
(exhibit 3 -- equipment and costs)

- **TELEMEDICINE**

Function:	Psychiatry, Dermatology, Pediatrics, Geriatrics, Internal Medicine, Trauma Evaluation, Cardiology	
Equipment:	Interactive video with various diagnostic evaluation equipment	
Equipment Cost:	Approximately $64,000. Additional costs include room preparation, ranging from $10,000 to $30,000	
Transmission Line Needs:	Fiber optic line with multiple switch 56 capability; 6 to 8 lines	
Transmission Cost:	One time hook up of $200 per line	$1,200 to $1,600
	Monthly service charge $40 per line	$ 210 to $ 320 (annual - $3,840)
	long distance rates	costs vary by carrier/community

(exhibit 4 -- map)
(exhibit 5 -- equipment and costs)

- INTERACTIVE DISTANT EDUCATION

Function: Provide degree training programs (ADN) and continuing education support (CEU)

Equipment: Interactive video with support accessories, i.e., PC, whiteboard, graphics camera, etc.

Equipment Cost: Approximately $70,000 per site. Additional costs include room preparation, ranging from $10,000 to $30,000

Transmission Line Need: Currently using a quarter T-1 line; however, can function on multiple switch 56 lines or fractional quarter T-1.

Transmission Cost:

One time hook up cost of the T-1 line	$3,100
Monthly service charge	$ 165 plus $6.77 per mile
No transmission cost	

Example:
RENO to ELKO (300 miles)

Installation	$ 3,100
Service $165 X 12 months	1,980
$6.77 X 300 X 12	24,372
Maintenance Contract	300
TOTAL FIRST YEAR	$29,752
ANNUAL COSTS AFTER 1ST YR	$26,652

(exhibit 6 -- map)
(exhibit 7 -- equipment and costs)
(exhibit 8 -- program information)