Wyoming Unified Network Cost Sharing Report



Wyoming Department of Enterprise Technology Services

And

Wyoming Community College Commission

November 1, 2018

WYOMING UNIFIED NETWORK COST SHARING - Budget Bill, Section 077 Footnote #3

OBJECTIVE:

Enterprise Technology Services (ETS) in collaboration with the Wyoming Community College Commission (CCC) has prepared this report for the Joint Education Interim Committee and the Joint Appropriations Committee on the use, costs and proportionate funding share of the Wyoming Unified Network (WUN) by the community colleges. This report includes a method of billing for costs of the WUN to community colleges and an estimate of the amount currently paid by general funds, school foundation program funds or other funds for services rendered to the community colleges.

OVERVIEW:

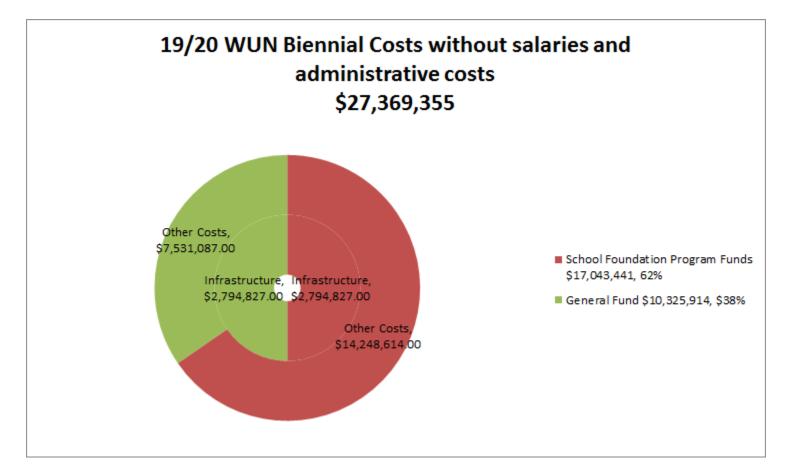
When the Wyoming Equality Network (WEN) was initially deployed during the late 90's, the original design included hubs with spokes located throughout the state. The decision was made to physically locate these hubs on the seven community colleges' campuses. The community colleges were allowed to connect to the WEN in exchange for storage space for the network equipment needed to support each hub and spoke design. In 2005, the Wyoming Department of Education released an RFP for the WEN and the design was changed with the new contract. The equipment was removed from the community colleges and returned to Cheyenne, which eventually caused a single point of failure for the connectivity provided to the school districts. During this design transition, the community colleges were allowed to maintain their access to WEN. When the WEN was transferred to ETS, no changes in the relationship with the community colleges were made.

During the 2015/2016 budget period, ETS requested and received approval from the Joint Appropriations Committee to fund the unification of the State's core network along with the Wyoming Equality Network (WEN) to create the new WUN and to extend the same to a 100Gb capacity. The 100 Gb backbone interconnects eight locations in the communities of Cheyenne, Laramie, Casper, Sheridan, Basin, Riverton, Jackson and Rock Springs. These core locations join fiber lines from multiple vendors and gives the State the ability to scale bandwidth on the backbone as future demand requires. The WUN focuses on education first and sets a goal to provide all districts access to 200 Kbps of bandwidth per student. This network provides stable, high speed connections to the school districts and community colleges statewide, thus improving educational opportunities for Wyoming's youth in addition to providing high speed, high availability broadband access to State agencies. This network provides economic growth, education, connected government and innovation for the State of Wyoming.

Since the 2015/2016 budget period, no additional technical or functional changes have been made to the WUN. The funding for the WUN remains with the core network funded 50 percent with general funds; 50 percent with school foundation program funds. Funding for the state agencies requiring non-core locations to connect to the WUN core resides in their budgets and are billed monthly for those connections through ETS.

COSTS OF WUN:

Based on the current allocation model, the 19/20 biennial costs of the WUN¹ are as follows:



The infrastructure costs (Utilities-Core Network) is a 50/50 split between School Foundation Program Funds and General Funds in the 19/20 budget and all other costs are directly associated as either educational expenses (K12 and community colleges) or for the state agencies' use only. The \$5,589,654 biennial infrastructure costs that are required in order to support the 100Gb network regardless of who utilizes the network are as follows:

- Utilities On Ramps \$1,635,380 The on-ramps are the physical vendor hardware needed at each core location to provide connectivity.
- Utilities Cross Connects \$792,334 The cross connects are the ports for the plug, which allow for the connections from the vendor's drop-off location to the on-ramps.
- Utilities Core Circuits \$2,618,154 These core circuits provide the 100Gb backbone.

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Appendix A - Handout provided at December 6, 2017 Joint Appropriations Committee Meeting. Wyoming Unified Network Cost Sharing Report

Utilities - Internet Access \$543,786 - The internet access includes three redundant 10Gb connections from the WUN to the Internet.

The other biennial costs represented in this chart are directly assigned to the funding type and are as follows:

Funding Source	Utilities-Last Mile	Real Property Repairs	Equipment Repairs	Hardware	Maintenance	Totals
School Foundation Program Funds	\$12,072,806	\$50,000	\$6,000	\$283,700	\$1,836,108	\$14,248,614
General Funds	\$1,828,057	\$50,000	\$3,600	\$1,970,208	\$3,679,222	\$7,531,087
Total	\$13,900,863	\$100,000	\$9,600	\$2,253,908	\$5,515,330	\$21,779,701

Utilities- Last Mile - The last mile circuits are the connectivity from the WUN infrastructure (core backbone) to each specific location receiving connectivity to the WUN.

Real Property Repairs - When providing a connection to a demarc (the physical point at which the private telecommunications company ends and the network begins), purchasing equipment to meet minimum requirements to complete the upgrade and meet the standards of the new connectivity is normally required.

Equipment Repairs - These funds are used to replace the Uninterrupted Power Supply (UPS) batteries that are protecting core network equipment.

Hardware -

- School Foundation Program Funds Content Filters/District Router Upgrades/Circuit Termination Switches
- General Funds Cables and SFP's/Switches/Wireless Access Points/Firewalls/Network Analyzers

Maintenance -

- School Foundation Program Funds Routers/Firewalls/Content Filters/Point to Point Wireless
- General Funds Routers/Firewalls/Security Monitoring/In Line Data Centers/Technician Network Path Troubleshooting/Firewall Change and Log Management

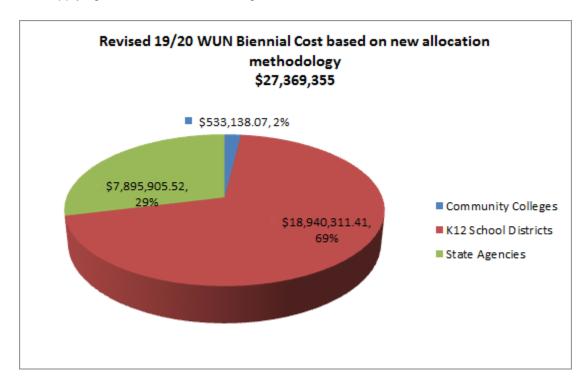
OPTION 1

DIRECT COSTS ONLY - NO INDIRECT ALLOCATION OF CORE INFRASTRUCTURE

Currently we fund the core infrastructure as a 50/50 split between general funds and school foundation funds. This first option keeps that funding model intact and does not allocate any of the core infrastructure costs to the colleges. The colleges would pay for their utilities (last mile direct costs), Brocade hardware and maintenance and the circuit termination switch only. These costs are only incurred based on the community colleges' needs.

ALLOCATIONS APPLIED TO COSTS:

After applying the allocation methodologies listed above, the costs would be distributed as follows:



PROPORTIONATE FUNDING SHARE TO THE COLLEGES:

Community College	Utilities - Last Mile (Direct Cost)	Hardware (Brocade and Circuit Termination Switch) Maintenance (Brocade		Total Biennial Cost
Casper College*	\$0.00	\$5,698.21	\$8,910.02	\$14,608.23
Central Wyoming College	\$139,130.00	\$2,081.65	\$3,254.97	\$144,466.62
Eastern Wyoming College	\$34,920.00	\$1,614.34	\$2,524.26	\$39,058.60
Laramie County Community College	\$49,835.00	\$5,853.36	\$9,152.62	\$64,840.98
Northern Wyoming Community College District	\$61,996.00	\$4,159.60	\$6,504.17	\$72,659.77
Northwest College	\$161,256.00	\$2,859.26	\$4,470.89	\$168,586.15
Western Wyoming Community College	\$18,235.00	\$4,166.99	\$6,515.72	\$28,917.71
Totals	\$465,372.00	\$26,433.41	\$41,332.65	\$533,138.06

^{*}Casper College is part of the core backbone so does not have any last mile circuit costs.

OPTION 2

ALLOCATION METHODOLOGY (Without Salaries and Administrative Costs):

Based on the current constraints and information available at this time we felt the most appropriate method to be used to allocate costs properly was full-time equivalency for direct and indirect costs of the Wyoming Unified Network (without salaries and administrative costs). We have a tool that can measure usage but that tool does not accurately represent the connectivity that is available to all. So the decision was made to use full-time equivalency across the board to achieve the most accurate allocation at this time.

Based on collaboration with the Community College Commission the full-time equivalency users are as follows:

Allocation	FTE
Community Colleges Student Count FTE	14,311
K12 Student Count	92,967
State Agencies FTE	8,500
Total FTE	115,778

All indirect costs are allocated using the FTE numbers provided in the above chart. Those indirect costs are:

Infrastructure - Utilities - Core Network Real Property Repairs Equipment Repairs

The following are direct costs that do not have to be allocated using the FTE methodology:

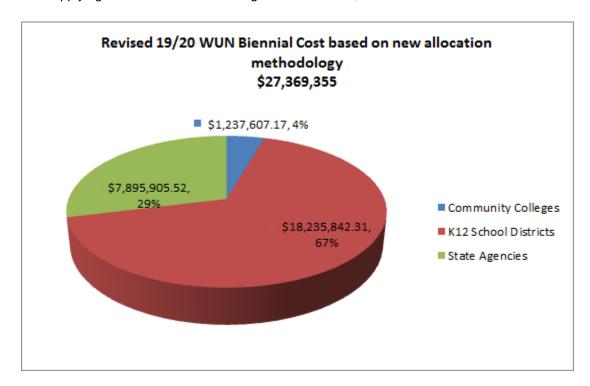
Utilities - Last Mile - Direct Costs - All last mile costs are directly attributable to a location and represent the connectivity from the WUN core backbone to the community colleges and associated outreach locations, K12 schools and state agency locations. The costs differ per community college based on the number of outreach centers receiving services.

Hardware

Maintenance

ALLOCATIONS APPLIED TO COSTS:

After applying the allocation methodologies² listed above, the costs would be distributed as follows:



The overall change in funding from how the WUN is currently funded is represented below:

Funding Source	19/20 Budget	New Allocation Applied	Net Change to Funds
School Foundation Program Funds	\$17,043,441	\$18,235,842.31	\$1,192,401.31
General Funds	\$10,325,914	\$7,895,905.52	(\$2,430,008.48)
Community Colleges	\$0	\$1,237,607.17	\$1,237,607.17

² See Appendix B for details. Wyoming Unified Network Cost Sharing Report

PROPORTIONATE FUNDING SHARE TO THE COLLEGES:

Community College	Monthly Cost	Biennial Cost
Casper College	\$6,936.23	\$166,469.53
Central Wyoming College	\$8,331.00	\$199,943.99
Eastern Wyoming College	\$3,420.08	\$82,081.87
Laramie County Community College	\$9,201.55	\$220,837.25
Northern Wyoming Community College District	\$7,646.50	\$183,516.06
Northwest College	\$10,199.48	\$244,787.55
Western Wyoming Community College	\$5,832.12	\$139,970.91
Totals		\$1,237,607.17

OPTION 3

ALLOCATION METHODOLOGY (With Salaries and Administrative Costs):

This allocation includes all salary and administrative costs³ in addition to the costs allocated in Option 2.

These indirect costs are allocated using a level of effort as follows:

School Foundation Program Funds (K12 92%/CC 8%) - General Fund (K12 23%/CC 2%/State Agencies 75%) - Internal Service Funds (1% of 2 FTE's)

Salaries

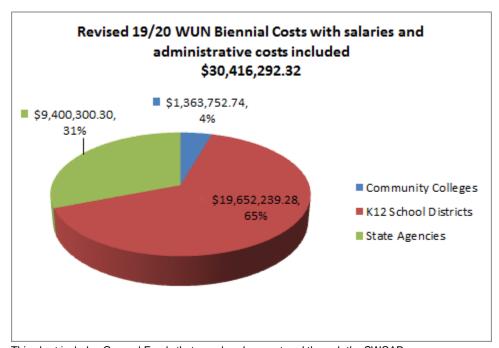
Communication

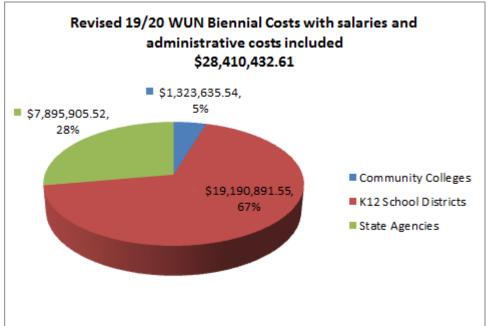
Dues/Licenses/Subscriptions

Travel

Office Supplies

ALLOCATIONS APPLIED TO COSTS:





This chart includes General Funds that are already recaptured through the SWCAP process.

This chart does not include General Funds that are recaptured through the SWCAP process.

³ See Appendix C for details. Wyoming Unified Network Cost Sharing Report

PROPORTIONATE FUNDING SHARE TO THE COLLEGES:

With All Salary and Administrative Costs Included

Community College	Monthly Cost	Biennial Cost
Casper College	\$7,687.10	\$184,490.33
Central Wyoming College	\$9,081.87	\$217,964.79
Eastern Wyoming College	\$4,170.94	\$100,102.67
Laramie County Community College	\$9,952.42	\$238,858.05
Northern Wyoming Community College District	\$8,397.37	\$201,536.86
Northwest College	\$10,950.35	\$262,808.35
Western Wyoming Community College	\$6,582.99	\$157,991.70
Totals		\$1,363,752.74

Without Generally Funded Salary and Administrative Costs that are Recaptured Through SWCAP

Community College	Monthly Cost	Biennial Cost
Casper College	\$7,448.30	\$178,759.30
Central Wyoming College	\$8,843.07	\$212,233.76
Eastern Wyoming College	\$3,932.15	\$94,371.64
Laramie County Community College	\$9,713.63	\$233,127.02
Northern Wyoming Community College District	\$8,158.58	\$195,805.83
Northwest College	\$10,711,55	\$257,077.32
Western Wyoming Community College	\$6,344.19	\$152,260.67
Totals		\$1,323,635.54

FY19-20 Unified Network Biennial Cost \$27,369,355 Without Salaries and Administrative Costs

School Foundation Funds

\$17,043,441

STANDARD BUDGET \$13,305,616

\$12,000,000 0203-Circuit Costs \$10,000 0201-Property Upgrades \$3,600 0202-Equipment Repairs \$232,016 0292-Router Maintenance \$130,000 0292-Firewall Maintenance \$900,000 0292-Content Filter Maint \$30,000 0292-Point to Point Wireless Maint

EXCEPTION BUDGET \$3,737,825

\$2,867,633 0203-Circuit Costs \$40,000 0201-Property Upgrades \$2,400 0202-Equipment Repairs \$150,000 0242-District Core Router \$73,700 0242-Content Filters \$60,000 0242-Circuit Termination Switch \$102,371 0292-Router Maint \$441,721 0292-Firewall Maint

General Fund

\$10,325,914

STANDARD BUDGET \$6,654,892

\$4,622,884 0203-Circuit Costs \$10,000 0201-Property Upgrades \$3,600 0202-Equipment Repairs \$396,408 0292-Router Maint \$1,350,000 0292-Firewall Maint \$45,000 0292-Security Monitoring Maint \$40,000 0292-Firewall Change/Log Maint \$187,000 0292-Ent Backend Tech Maint

EXCEPTION BUDGET \$3,671,022

\$40,000 0201-Property Upgrades \$20,000 0242-Cables and SFPS \$40,000 0242-Data Center Switches \$240,000 0242-Circuit Termination Switch \$180,000 0242-Client Access Switches \$40,000 0242-Wireless Access Points \$178,205 0242-VPN Firewall \$767,003 0242-Core Firewalls \$35,000 0242-Firewalls for Encryption \$190,000 0242-State Guest Firewalls \$200,000 0242-Network Analyzers \$80,000 0242-Firewall Visibility and Analysis \$435,583 0292-Router Maint \$913,000 0292-Firewall Maint \$75,000 0292-Security Monitoring Maint \$71,231 0292-In Line Datacenter Maint \$160,000 0292-Ent Backend Tech Maint \$6,000 0292-Firewall Change/Log Maint

APPENDIX B:

			Utilities-Core Network	Utilities-Last Mile	Real Property Repairs	Equip Repairs	Hardware	Maintenance	Total
			\$5,589,654.00	\$13,900,863.00	\$100,000.00	\$9,600.00	\$2,253,908.00	\$5,515,330.00	\$27,369,355.00
	FTE	Percentage							
Casper College	3085	2.66%	\$148,940.93	\$0.00	\$2,664.58	\$255.80	\$5,698.21	\$8,910.02	\$166,469.53
Central Wyoming College	1127	0.97%	\$54,410.51	\$139,130.00	\$973.41	\$93.45	\$2,081.65	\$3,254.97	\$199,943.99
Eastern Wyoming College	874	0.75%	\$42,195.91	\$34,920.00	\$754.89	\$72.47	\$1,614.34	\$2,524.26	\$82,081.87
Laramie County Community College	3169	2.74%	\$152,996.37	\$49,835.00	\$2,737.13	\$262.76	\$5,853.36	\$9,152.62	\$220,837.25
Northern Wyoming Community College District	2252	1.95%	\$108,724.46	\$61,996.00	\$1,945.10	\$186.73	\$4,159.60	\$6,504.17	\$183,516.06
Northwest College	1548	1.34%	\$74,736.00	\$161,256.00	\$1,337.04	\$128.36	\$2,859.26	\$4,470.89	\$244,787.55
Western Wyoming Community College	2256	1.95%	\$108,917.58	\$18,235.00	\$1,948.56	\$187.06	\$4,166.99	\$6,515.72	\$139,970.91
K12 School Districts	92967	80.30%	\$4,488,360.17	\$11,607,434.00	\$80,297.64	\$7,708.57	\$257,266.59	\$1,794,775.34	\$18,235,842.31
State Agencies	8500	7.34%	\$410,372.08	\$1,828,057.00	\$7,341.64	\$704.80	\$1,970,208.00	\$3,679,222.00	\$7,895,905.52
	115778		\$5,589,654.00	\$13,900,863.00	\$100,000.00	\$9,600.00	\$2,253,908.00	\$5,515,330.00	\$27,369,355.00

APPENDIX C:

			Salaries	Communication	Dues/Licenses/Sub scriptions	Travel	Office Supplies	Total
	FTE	Percentage	\$985,043.00	\$4,639.00	\$18,000.00	\$27,815.00	\$2,600.00	\$1,038,097.00
School Foundation Program Funds								
Casper College	3085	2.88%	\$11,257.63	\$53.02	\$205.71	\$317.89	\$29.71	\$11,863.97
Central Wyoming College	1127	1.05%	\$11,257.63	\$53.02	\$205.71	\$317.89	\$29.71	\$11,863.97
Eastern Wyoming College	874	0.81%	\$11,257.63	\$53.02	\$205.71	\$317.89	\$29.71	\$11,863.97
Laramie County Community College	3169	2.95%	\$11,257.63	\$53.02	\$205.71	\$317.89	\$29.71	\$11,863.97
Northern Wyoming Community College District	2252	2.10%	\$11,257.63	\$53.02	\$205.71	\$317.89	\$29.71	\$11,863.97
Northwest College	1548	1.44%	\$11,257.63	\$53.02	\$205.71	\$317.89	\$29.71	\$11,863.97
Western Wyoming Community College	2256	2.10%	\$11,257.63	\$53.02	\$205.71	\$317.89	\$29.71	\$11,863.97
K12 School Districts	92967	86.66%	\$906,239.56	\$4,267.88	\$16,560.00	\$25,589.80	\$2,392.00	\$955,049.24
	107278		\$985,043.00	\$4,639.00	\$18,000.00	\$27,815.00	\$2,600.00	\$1,038,097.00
			Salaries	Dues/Licenses/ Subscriptions	Travel	Office Supplies	Total	
	FTE	Percentage	\$1,918,359.71	\$32,500.00	\$50,500.00	\$4,500.00	\$2,005,859.71	
General Funds								
Casper College	3085	2.66%	\$5,481.03	\$92.86	\$144.29	\$12.86	\$5,731.03	
Central Wyoming College	1127	0.97%	\$5,481.03	\$92.86	\$144.29	\$12.86	\$5,731.03	
Eastern Wyoming College	874	0.75%	\$5,481.03	\$92.86	\$144.29	\$12.86	\$5,731.03	

Laramie County Community College	3169	2.74%	\$5,481.03	\$92.86	\$144.29	\$12.86	\$5,731.03	
Northern Wyoming Community College District	2252	1.95%	\$5,481.03	\$92.86	\$144.29	\$12.86	\$5,731.03	
Northwest College	1548	1.34%	\$5,481.03	\$92.86	\$144.29	\$12.86		
Western Wyoming Community College	2256	1.95%	\$5,481.03	\$92.86	\$144.29	\$12.86	\$5,731.03	
K12 School Districts	92967	80.30%	\$441,222.73	\$7,475.00	\$11,615.00	\$1,035.00	\$461,347.73	
State Agencies	8500	7.34%	\$1,438,769.78	\$24,375.00	\$37,875.00	\$3,375.00	\$1,504,394.78	
	115778		\$1,918,359.71	\$32,500.00	\$50,500.00	\$4,500.00	\$2,005,859.71	
			Salaries					
	FTE	Percentage	\$298,061.26					
Internal Service Funds								
Casper College	3085	2.66%	\$425.80					
Central Wyoming College	1127	0.97%	\$425.80					
Eastern Wyoming College	874	0.75%	\$425.80					
_aramie County Community College	3169	2.74%	\$425.80					
Northern Wyoming Community College District	2252	1.95%	\$425.80					
Northwest College	1548	1.34%	\$425.80					
Western Wyoming Community College	2256	1.95%	\$425.80					
K12 School Districts	92967	80.30%	\$0.00					
State Agencies	8500	7.34%	\$0.00					
	115778		\$2,980.61					

APPENDIX D:

ADDITIONAL INFORMATION PROVIDED BY ETS:

Since ETS has never reviewed WUN costs in this manner and has always allocated the infrastructure costs (core network) as a 50/50 split between the School Foundation Program Funds and the General Funds, it does create the following layered funding modifications:

School Foundation Program Funds:

Funding Source	19/20 Budget	New Allocation Applied	Net Change to Funds
School Foundation Program Funds	\$17,043,441	\$15,948,622.69	(\$1,094,818.31)
General Funds	\$0	\$209,297.36	\$209,297.36
Community Colleges	\$0	\$885,520.95	\$885,520.95

General Funds:

Funding Source	19/20 Budget	New Allocation Applied	Net Change to Funds
School Foundation Program Funds	\$0	\$2,287,219.62	\$2,287,219.62
General Funds	\$10,325,914	\$7,686,608.16	(\$2,639,305.84)
Community Colleges	\$0	\$352,086.22	\$352,086.22

• When this new allocation is only applied to the School Foundation Program Funds, you do see a savings to that fund. But, when that same allocation methodology is applied to the general funds, the School Foundation Program Funds are negatively impacted.

How do we define funding requests for future outreach locations and the timeline of those requests? We have struggled in the past with being able to budget appropriately for new locations that were not requested prior to the budget request.

No prior reports ever discuss the cost of agency specific direct circuits billed out through Internal Service Funds.

WUN is considered a core service so all generally funded expenses are recaptured through the SWCAP process. Identifying them in this report and allocating portions of the generally funded costs to the colleges would change how we ask for funds for salaries and administrative costs to support a portion of the WUN as a billable service in future bienniums. It would lower our general fund ask but it would increase our internal service fund ask and positions/administrative costs would require split funding requests. This would be a one-off as to how we currently handle core services and the salary/administrative costs of the same.

APPENDIX E:

ADDITIONAL INFORMATION PROVIDED BY COMMUNITY COLLEGE COMMISSION:

There needs to be recognition that the K-12 system and the community college system don't operate in silos. The colleges provide a significant amount of support to the K-12 system and its students, as well as to other public sector entities. Following are some of the more prominent examples:

- In addition to the thousands of college credit hours earned by high school students through concurrent enrollment and "traditional" dual enrollment, nearly 6,000 college credit hours per year are earned by high school students through some 700 online courses offered by the colleges. The WUN plays a crucial role in the delivery of this distance education.
- The data now available to the school districts on the Hathaway Scholarship Program stems from not only sharing agreements, but also the real-time access provided by the WUN, and supported by technology staff at the Commission, the colleges, UW and the Department of Education.
- With the recent accomplishment of a learning management system (LMS) shared by school districts, colleges and UW, statewide connectivity will become increasingly important. This same connectivity is an integral part of the success of the Commission's State Longitudinal Education Data System (SLEDS) the state's only comprehensive education reporting system.
- The colleges support the school districts in all 23 counties, yet only the residents of seven of those counties pay property taxes in support of the colleges. Ironically, if "last miles" are used as the basis for WUN cost-sharing, the smallest colleges would be impacted disproportionately relative to the largest colleges.
- Individual colleges provide the following technical resources to school districts:
 - One of the eight core locations of the WUN is located on the Casper College campus. Hosting the associated equipment directly benefits both ETS and the school districts.
 - Teton County School District #1 uses Central Wyoming College's WUN circuit in Jackson for its office in the Center for the Arts.
 - Eastern Wyoming College aggregates for Goshen County schools, and Platte County School District #2 in Guernsey.
 - John Schiffer High School is located on Northern Wyoming Community College District's Sheridan campus. The college's support of the high school includes use of a portion of the college's WUN circuit.
- All of the colleges regularly host activities that benefit K-12 students, but also utilize the colleges' WUN capacity. These activities include, but are not limited to, the Wyoming Youth Challenge, the Help Yourself Academy, the Science Olympiad, SkillsUSA, YMCA activities, assessment testing (including for home-schooled students), science fairs, math quizzes, livestock judging camps, and athletic competitions (broadcast media).
- Virtually all of the colleges also support UW outreach locations with phone and/or data services dependent upon the WUN.
- And finally, at least two of the colleges support state programs with their WUN circuits. This includes educational services at five separate Department of Corrections' locations (Rawlins, Torrington, Lusk, Newcastle and Riverton).

To summarize, school districts don't just derive benefits from their own WUN circuits; they benefit significantly from the colleges' circuits. And while it may be possible to approximate college costs, the billing process would likely be complicated and time-consuming for everyone involved, and the colleges would still have the option of recouping some of their invoiced costs by passing them through to other campus users, including school districts, UW and state agencies. More importantly, given the variability of "last miles" among the colleges, and the disproportionate costs associated mostly with small colleges, some of them may opt out of the WUN in favor of commercial options. This seems counterproductive, particularly for education as a whole, but also for the economic development initiatives that are dependent upon workforce training.

Ultimately, should the decision be made to move forward with billing the colleges for a portion of WUN costs, the Commission may request that the General Fund be substituted as the source of revenue for these costs. It could possibly even be argued that W.S. 21-18-202 (a)(iv) requires this. Specifically, "(t)he commission shall . . . (m)aintain an administrative computing system contract and Internet or similar proprietary or common carrier electronic system access for members of the system." The difficulty with this approach, unfortunately, is that the report to the JEIC and the JAC is due well after the supplemental budget deadline (assuming a billing effective date of July I, 2019), so any authorizing legislation might have to include language in support of this substitution.