Public Safety Communications Commission

Report to
Governor and Joint Transportation, Highways and Military Affairs Committee

June 2017
June 16, 2017

Senator Curt Meier, Co-Chairman  
Representative John Eklund, Co-Chairman  
Joint Transportation, Highways and Military Affairs Interim Committee  
Wyoming State Legislature  
200 W. 24" Street, Room 213  
Cheyenne, WY 82002

Re: Public Safety Communications Commission 2017 Report

Dear Co-Chairman Meier, Co-Chairman Eklund, and Members of the Committee;

Wyoming Statute § 9-2-1104 (a) (vii) requires the Public Safety Communications Commission (PSCC) to submit a report to the Governor and the Joint Transportation, Highways and Military Affairs Interim Committee for the period of July 1, 2018 to June 30, 2022 detailing the expected costs of implementing WyoLink, the statewide system networking plan.

A draft copy was provided to you at your May 31, 2017 interim meeting. The PSCC approved the report at its June 7, 2017 meeting. Enclosed please find a copy of the final report.

If you have any questions or comments, please feel free to contact me.

Respectfully,

Mark Harshman, Chairman  

William T. Panos, Director
June 16, 2017

The Honorable Matthew H. Mead
Governor, State of Wyoming
Capitol Building
Cheyenne, WY 82002

Re: Public Safety Communications Commission 2017 Report

Dear Governor Mead;

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Respectfully,

Mark Harshman, Chairman

William T. Panos, Director
Public Safety Communications Commission Report
BFY2019/2020 & BFY2021/2022

Purpose

The purpose of this document is to satisfy the WyoLink reporting requirements of House Enrolled Act 0017.

“On or before May 31 of each odd numbered year, submit to the Governor and the Joint Transportation, Highways and Military Affairs interim committee a report covering the period beginning July 1 of the following year and ending June 30 in the fourth succeeding year detailing the expected costs of implementing the statewide system networking plan. The report shall include projections of one-time and recurring costs.”

Background:

At the encouragement of the Wyoming's public safety community and the federal government, the Wyoming legislature recognized a need for a comprehensive and coordinated statewide emergency communications network and established Wyoming's Public Safety Communications Commission (Communications Commission) effective July 1, 2004, through W.S. 9-2-1101-9-2-1104. This occurred at a time when federal funding for public safety communications peaked following the 9/11 incidents. At that time, the Communications Commission was assigned to the Department of Homeland Security.

The Communications Commission has been responsible for providing policy level direction related to planning, design and implementation, best practices, and standard approaches to address public safety communications and interoperability issues. Over the years, field implementation of the Communications Commission policy has been completed primarily by the Wyoming Department of Transportation (WYDOT). WYDOT has recently reconstructed its support of the Communications Commission work to stabilize and grow capacity for public safety communications. Today, most of the previous federal funding for public safety communications is gone. State general funds and other WYDOT funding are being used to support the Communications Commission and inter-operative emergency communications in our state.

2017 Legislative Changes to W.S. 9-2-1102 through HEA0017:

This act reorganized the Public Safety Communications Commission. It transferred administrative support responsibilities from the Wyoming Office of Homeland Security to the Wyoming Department of Transportation, thereby improving oversight and accountability of the agency actually implementing the program, reducing the use of general funds, and stabilizing the program overall.

The act streamlined the voting members of the Commission from seventeen to eleven. Members removed from the Commission included the Wyoming Livestock Board, Department of State
Parks and Cultural Resources, Wyoming State Fire Marshall, Wyoming Office of Homeland Security, Wyoming Department of Health, and federal government or federal government agencies. This was to improve local government presence, including representation from municipal government, county government, police chiefs, county sheriffs, fire chiefs, tribal representatives, and improved ambulance/medical service representation;

The act added the Director of the Wyoming Department of Transportation as an ex-officio member of the Commission;

The act added the Budget Division of the Department of A&I as one of the agencies that the Commission will work with to promote the development, improvement, and efficiency of public safety communications systems in the state; and

The act added a reporting requirement that details the expected costs of implementing the statewide system networking plan for the following two bienniums (this report and attachments).

**WyoLink Funding:**

There are three distinct areas which have been identified for WyoLink funding going into the future: Capitalization, Modernization, and Maintenance & Operation.

WYDOT is currently paying the majority of the capitalization and modernization costs with highway funds.

*Capitalization: Infrastructure Additions and Enhancements*

Currently, there are 75 WyoLink tower sites across the State of Wyoming. WYDOT has secured $16 million in Federal Highway Funds for enhanced build out expansion of 16 tower sites. A request for proposals for build out of these 16 sites has been issued with a target for contract award and work to begin in the summer of 2017.

*Modernization: Hardware and Software Upgrades and Updates*

The T-1 and Metro Optical Ethernet (MOE) network circuits are being converted onto the Wyoming Unified Network (WUN) to improve connectivity and reduce costs. All of the dispatch center console replacements were completed in 2016. The Communications Commission and WYDOT are formulating a plan for further modernization and to secure a permanent funding source.

*Maintenance and Operation: Annual Recurring Charges*

Overall operational cost for hardware and software maintenance of the WyoLink system over the 2017/2018 Biennium was forecasted to be $4,625,773. Of this amount, the Legislature appropriated $2,746,091 from the local government capital construction account to cover the local government’s portion of the hardware and software maintenance costs. The Legislature directed WYDOT to provide local governments with informational invoices for these costs.
The difference between the forecasted amount and the amount appropriated on behalf of the local agencies is being paid by a combination of General Funds and the WYDOT Highway Fund. The General Fund portion of these costs is $512,098. The amount WYDOT is paying is $1,367,584, which accounts for more than 30% of the total hardware and software maintenance costs. Currently, WYDOT use constitutes approximately 20% of total use of the WyoLink system.

**Proposed Core Tower Capitalization**

WYDOT starts work this year to complete the capitalization or initial “build-out” of the WyoLink system.

*Core Tower Site Evaluation Criteria:*

Priority was given to sites which have licensed frequencies or licensed frequencies in close proximity with a potential for being moved to the site. WyoLink users experience, mobile coverage testing, and benefit to WyoLink were factors used to determine the priorities for improved coverage

Six locations have been preliminarily identified using the evaluation criteria: Alcova area in Natrona County, Bondurant area in north western Sublette County, northern Goshen County, Ten Sleep area in Washakie County (including the southern portion of the Bighorn National Forest), northern Big Horn County, and Orin Junction area of Converse County.

**Proposed Portable Enhancement Tower Capitalization**

*Portable Enhancement Tower Site Evaluation Criteria:*

The availability of licensed frequencies and population of the community were used to prioritize potential new sites. The first group of 6 sites has a minimum population base of 3,500 and the second group of 4 sites has a minimum population base of 1,200. Coverage needs were determined by WyoLink user experiences and testing.

The first group includes: Rock Springs (two sites – population 23,036), Evanston (population 12,359), Jackson (population 9,577), Buffalo (population 4,585), and Newcastle (population 3,532).

The second group includes: Sundance (population 1,182), Greybull (population 1,847), Lusk (population 1,567), and Wright (population 1,807).

**Modernization – Current Hardware Replacement**

Some equipment in the original WyoLink network is ready for replacement. The Quantar Base Radio WYDOT utilizes will be obsolete and not supported on WyoLink in 2018. When WyoLink moves to software version 7.18, the Quantar Base Radios will fail to work. Once it is determined that WyoLink must be updated to the 7.18 software, the 346 Quantar Base Radios
will need to be replaced with GTR8000 upgrade base radios. Every WyoLink site has a minimum of 5 base radios and 5 sites have 7 or more base radios. Current estimated replacement costs for this modernization is $12,183,397.

The base radios and microwave equipment at WyoLink sites operate on 48 volt direct current (DC). DC power plants convert the 120 volt commercial power to 48 volt DC. Existing DC power plants are nearing end-of-life and maintenance is becoming problematic. Current estimated replacement costs are $1,879,057.

Older hardware will continue to function while vendor support is anticipated to be eliminated for the near term once the aforementioned changes occur. Additional technological advancements will result in future periodic equipment replacements.

**Operation and Maintenance**

The current estimated contractual hardware and software updates and maintenance by fiscal years:

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<tr>
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Note: Standard budget for ongoing costs including, and limited to: hardware maintenance, software maintenance, and ongoing broadband costs. The increase in pricing from 2020 to 2021 is a result of the addition of 16 new sites.

**Mobile and Portable Radios**

The purchase and maintenance of user radios has historically been the user’s responsibility. The Communications Commission anticipates that the mobile and portable radios will continue to be a user responsibility, unless additional state or federal funding is found for these costs.

**Radio Frequencies**

Frequencies which can be licensed for a specific location of a site are necessary and will be a priority for determining location and feasibility of a site. Some, but not all, potential new sites have adequate licensed frequencies. WyoLink will need to document all Federal Communications Commission licensing avenues before requesting spectrum assistance from the National Telecommunications and Information Administration.
Summary:

Over the last few years, relationships with WyoLink users and the Communications Commission had not been optimized. Legislative changes enacted in HEA 0017 have started to leverage WYDOT's internal capacity to support WyoLink, strengthening local community confidence and financing, and enhancing leadership and support of the Communications Commission.

In 2016, specific actions were been taken by WYDOT to better understand the situation and to immediately resolve long-standing issues. These actions include a comprehensive review and investigation of the WyoLink team capacity, hiring a new WyoLink supervisor and Telecommunications Program Manager in WYDOT, hiring a Chief Technology Officer whose duties include leadership of WyoLink; several briefings with Governor's Office staff to understand conditions within WyoLink and with local communities; ongoing meetings with Communications Commission members to better understand conditions and re-build functionality; and WYDOT securing $16 million in federal funds for capital construction of 16 additional towers to complete WyoLink’s initial build-out and improve WyoLink coverage.

Attached is a summary of this report. The summary contains additional technical information about the WyoLink program, capitalization and operations, as well as WyoLink future needs.
Attachment A

Executive Summary

The purpose of this document is to satisfy the WyoLink reporting requirements of House Enrolled Act 0017:
“On or before May 31 of each odd numbered year, submit to the Governor and the Joint Transportation, Highways and Military Affairs interim committee a report covering the period beginning July 1 of the following year and ending June 30 in the fourth succeeding year detailing the expected costs of implementing the statewide system networking plan. The report shall include projections of one-time and recurring costs.”

HEA0017:

○ The act reorganizes the Public Safety Communications Commission, which provides direction related to planning, designing and implementing Wyoming's public safety communications infrastructure.

○ The act reduces the voting members of the Commission from seventeen to eleven.

○ The act adds the Director of the Wyoming Department of Transportation, or the Director's designee, as an ex-officio member of the Commission.

○ The act transfers administrative support responsibilities from the Wyoming Office of Homeland Security to the Wyoming Department of Transportation.
Executive Summary

Capitalization, Modernization & Operational distinctions:
WYDOT is currently paying the majority of the capitalization and modernization costs.

Capitalization: Infrastructure additions and enhancements
○ Currently 75 tower sites across the State
○ $16m Federal Funds secured for 16 Tower Enhanced Build Out Expansion
○ RFP for Build Out - targeted for Contract completion in Summer of 2017

Modernization: Hardware and Software upgrades and updates
○ T-1 and Metro Optical Ethernet (MOE) network circuits converted onto the Wyoming Unified Network (WUN) - In process
○ Dispatch Center Consoles Replacements - Completed
○ Further Modernization - Formulate plan and secure funding

Operational: Maintenance cost - annual recurring charges
○ Billing - Faux bills through FY18
○ Billing Methodology - Reviewing
○ Delivering WYDOT message - Statewide meetings ongoing
WyoLink Main Equipment

- **Master Sites**: There are currently two master sites, located in Cheyenne and Casper. Master sites are the computer control centers for the system.

- **Core Towers**: Radio sites that provide for mobile radio coverage for the system’s users. Core Towers are strategically located to provide wide area coverage for the highway transportation system.

- **Portable Enhancement Towers**: A site added to enhance portable radio coverage in a local area. Portable Enhancement Towers are located near cities and towns to provide first responders with radio coverage using their handheld portable radios.

- **Quantar Radio**: A Motorola base station radio located at a tower site for two way radio communications. The number of Quantars varies at each tower site depending on communications loading.

- **GTR Radio**: A Motorola base station radio designed to replace the obsolete Quantar base station radios. The GTR radios will be located at the core and portable enhancement tower sites. Its output power is 125 watts.

- **Handheld Radio**: A handheld, two-way radio that provides field personnel with the ability to communicate with a dispatch center and other mobile radios and portable radios. Its output power is 5 or 7 watts, depending on the radio.

- **Mobile Radio**: A vehicle mounted radio that provides communications with dispatch centers and other mobile and portable radios on the system. Its output power is 50 or 100 watts, depending on the radio and options ordered.

- **Control Stations**: A stationary desk top radio used in public safety offices and as backup radios in dispatch centers. Its output power is 50 or 100 watts, depending on the radio and options ordered.

- **Dispatch Center Console**: Computer based system used to facilitate communications with first responders in the field.
Proposed Core Tower Capitalization
BFY2019/2020 & BFY2021/2022

Core Site Evaluation Criteria:

(Location subject to change based off future evaluation information.)

Frequency Available Description
- Priority was given to sites which have licensed frequencies or licensed frequencies in close proximity with a potential for being moved to the site.

Coverage Need Description
- Wyolink users experience, mobile coverage testing and benefit to Wyolink were used to determine the priorities for improved coverage

1) Alcova
2) Bondurant area, north western Sublette County
3) Northern Goshen County
4) Ten Sleep Area-southern portion of Bighorn National Forest
5) Northern Big Horn County
6) Orin Junction
Predicted Vehicle VHF Coverage Map Statewide
Predicted Vehicle VHF Coverage Map

Alcova

New Sites

Existing Sites

Existing Coverage

New Coverage
Predicted Vehicle VHF Coverage Map
Bondurant Area - Sublette County
Predicted Vehicle VHF Coverage Map

New Sites

Existing Sites

Existing Coverage

New Coverage
Predicted Vehicle VHF Coverage Map
Predicted Vehicle VHF Coverage Map
Northern Big Horn County
Predicted Vehicle VHF Coverage Map
Orin Junction Area

- New Sites
- Existing Sites
- Existing Coverage
- New Coverage
Proposed On-Person Enhancement Towers
BFY2019/2020 & BFY2021/2022

Site Evaluation Criteria
(Locations subject to change based off future evaluation information.)

Frequency Available Description
  ○ Priority was given to potential new sites with licensed frequencies.

Population Description
  ○ Taken from the A&I Economic Analysis Division 2010 Decennial Census Data.

Ranking
  ○ The availability of licensed frequencies and population of the community were used to prioritize potential new sites. The first group of five sites has a minimum population base of 3,500 and the second group of sites has a minimum population base of 1,200. Coverage needs were determined by WyoLink users’ experiences and testing.

1) Rock Springs – Population: 23,036 (two sites)
2) Evanston – Population: 12,359
3) Jackson – Population: 9,577
4) Buffalo – Population: 4,585
5) Newcastle – Population: 3,532
6) Sundance – Population: 1,182
7) Greybull – Population: 1,847
8) Lusk – Population: 1,567
9) Wright – Population: 1,807
Predicted On-Person VHF Coverage Map – Rock Springs

- Existing Coverage
- New Coverage
Predicted On-Person VHF Coverage Map – Evanston
Predicted On-Person VHF Coverage Map - Jackson

- Existing Sites
- Existing Coverage
- New Coverage
Predicted On-Person VHF Coverage Map – Buffalo

Existing Coverage

New Coverage
Predicted On-Person VHF Coverage Map – Newcastle

- Existing Coverage
- New Coverage
Predicted On-Person VHF Coverage Map – Greybull

Existing Sites
Existing Coverage
New Coverage
Predicted On-Person VHF Coverage Map – Wright

- **Existing Coverage**
- **New Coverage**
Predicted On-Person VHF Coverage Map – Lusk

- Existing Sites
- Existing Coverage
- New Coverage
Predicted On-Person VHF Coverage Map – Sundance
Hardware Replacement

1. The vendor has stated the Quantar Base Radio will be obsolete and not supported on WyoLink in 2018. When WyoLink moves to 7.18 software, the Quantar base radios will fail to work.

2. Once it is determined that WyoLink must be updated to the 7.18 software, the 346 Quantar base radios will need to be replaced with GTR8000 base radios. Every WyoLink site has a minimum of five base radios and five sites have seven or more base radios.

3. The base radios and microwave equipment at WyoLink sites operate on 48 volt direct current (DC). DC power plants convert the 120 volt commercial power to 48 volt DC. Existing DC power plants are nearing end-of-life and maintenance is becoming problematic.

4. Older hardware will continue to function while vendor support is anticipated to be eliminated for the near term once the aforementioned changes occur. Therefore, technological advancements could occur which may result in some level of future periodic equipment replacements.

Base repeaters, Mountaintops & portable coverage enhancements.

<table>
<thead>
<tr>
<th>Date</th>
<th>WyoLink Version</th>
<th>Equipment</th>
<th>Event</th>
<th>Estimated Replacement Cost</th>
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<tbody>
<tr>
<td>8/1/2018</td>
<td>7.18</td>
<td>Quantar Base Radios</td>
<td>Quantar Base Radios NOT Supported</td>
<td>$12,183,397</td>
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<td>8/1/2018</td>
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<td>DC power plant upgrades</td>
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# Operations and Maintenance

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**NOTE:** Standard budget for ongoing costs including, and limited to: hardware maintenance, software maintenance, and ongoing broadband costs

*The increase in pricing from 2020 to 2021 is a result of the addition of 16 new sites*
Mobile and Portable Radios

- This has historically been a user responsibility

- The Communications Commission anticipates that the mobile and portable radios will continue to be a user responsibility

Note:
Federal Homeland Security Grant Funding was a major source of revenue for this and the future is unknown as to how much funding will be available
Frequencies

○ Frequencies which can be licensed for a specific location of a site are necessary and will be a priority for determining location and feasibility of a site. Some, but not all, potential new sites have adequate licensed frequencies.

○ WyoLink will need to document all Federal Communications Commission licensing avenues before requesting spectrum assistance from the National Telecommunications and Information Administration.
**Needs through BFY2019/2020 & BFY2021/2022**  
**Capitalization, Modernization & Operational**

<table>
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<th>Recommendation</th>
<th>BFY 2019/2020</th>
<th>BFY 2021/2022</th>
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<td>Capitalization of 6 Core and 10 Portable Enhancement Towers</td>
<td>$16,000,000</td>
<td>Continued from BFY2019/2020</td>
</tr>
<tr>
<td>Modernization - Hardware Replacement</td>
<td>TBD based on modernization plan*</td>
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<tr>
<td>Operational Costs</td>
<td>$4,834,064</td>
<td>$6,548,624</td>
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<td>Frequencies</td>
<td>$200,000</td>
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*Timing for modernization has not yet been determined, however estimated costs for this as of May, 2017 is $14,062,454*

Note: These numbers do not include T1/WUN conversion and circuit expenses, which WYDOT currently pays