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Public Safety Communications Commission Recommendations

BFY2017/2018 & BFY2019/2020

WyoLink Main Equipment

- **Master Sites:** There are currently two master sites, located in Cheyenne and Casper.

- **Core Towers:** Radio sites that provide for mobile radio coverage for the system's users. Communicates tower to tower and to handhelds where coverage exists.

- **Portable Enhancement Towers:** A site added to enhance portable radio coverage in a local area. Communicates tower to tower and to mobile radios.

- **Quantar Radio:** A Motorola radio intended for use as a base station, either as a radio or as a repeater. It is capable of conventional analog as well as transmission and reception. Its output power is 125 watts.

- **GTR Radio:** A Motorola radio intended for as a base station, either as a radio or as a repeater. It is capable of conventional analog as well as transmission and reception. It is an updated version of the Quantar radio. Its output power is 125 watts.

- **Handheld Radio:** Hand held, two-way radio transceiver that provides field personnel with transmit/receive capability for communication with the dispatch center and with other mobile radios. Its output power is 5 or 7 watts, depending on the radio.

- **Mobile Radio:** Vehicle mounted radio communication devices. Its output power is 50 or 100 watts, depending on the radio and options ordered.

- **Control Stations :** Stationary radio. Its output power is 50 or 100 watts, depending on the radio and options ordered.

- **Dispatch Center Console Seats** (in buildings): Its output power is effectively 125 watts because consoles use Quantar and GTR radios at Core and PCE sites to transmit.

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Recommended Core Towers BFY2017/2018 & BFY2019/2020

Core Site Evaluation Criteria Addendum

(Locations 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

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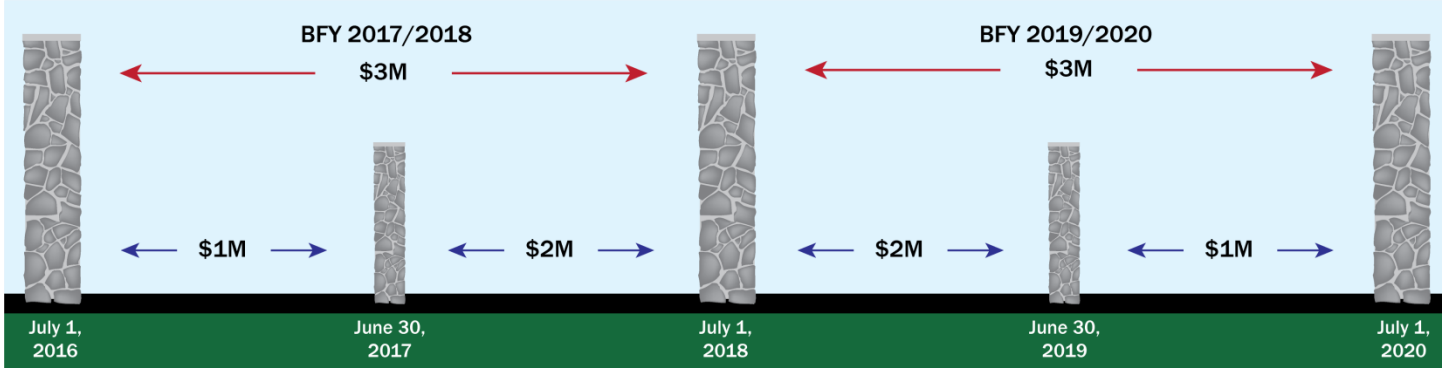
Core Towers for 2017/2018

1) Alcova (VHF frequencies under evaluation)
2) Bondurant area, north western Sublette County
3) Northern Goshen County

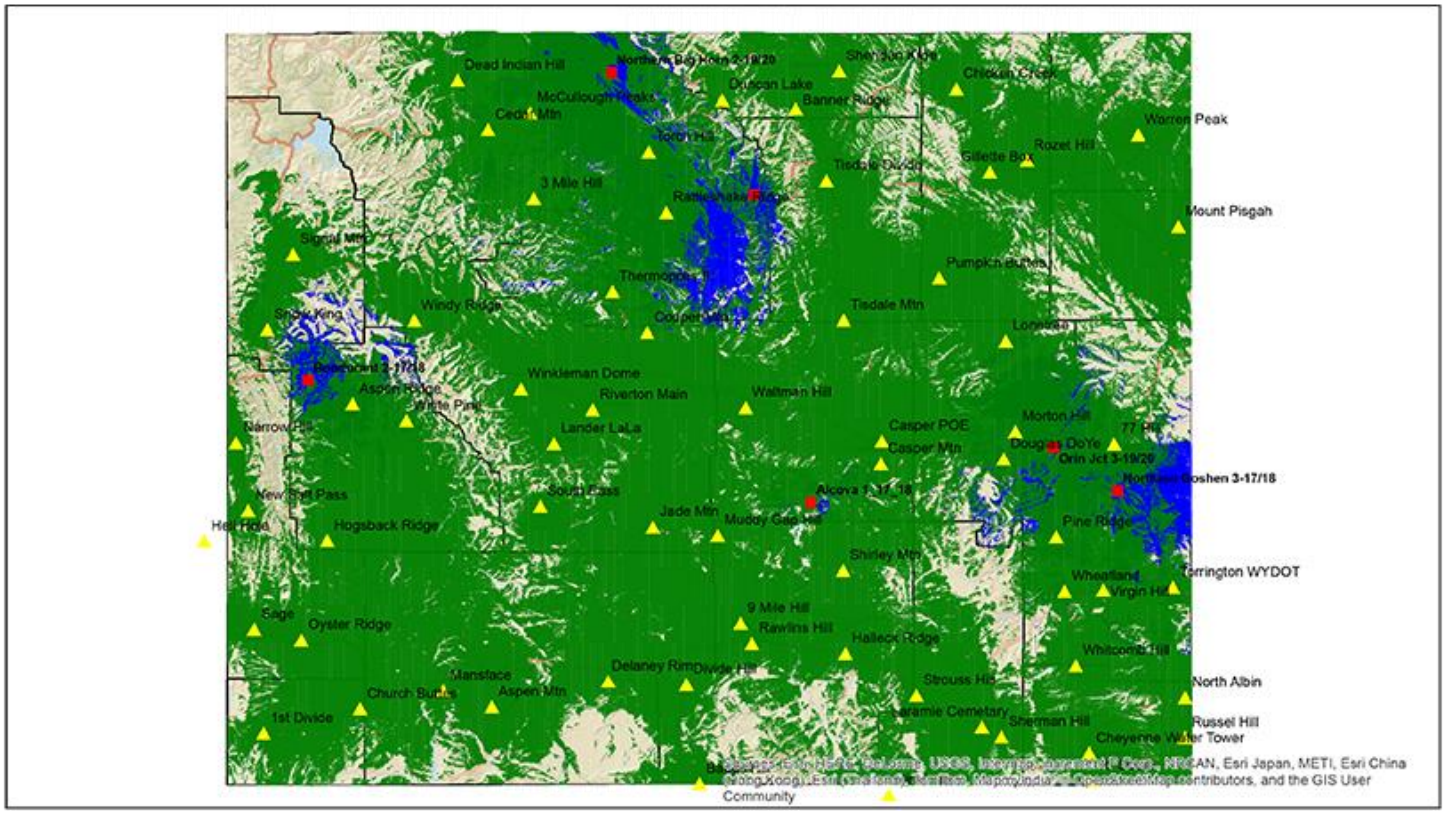
Core Towers for 2019/2020

1) Ten Sleep Area, southern portion of Big Horn National Forest and 1/4th of Hwy 16 between Buffalo & Worland
2) Northern Big Horn County
3) Orin Junction

Note: One-time Funding



Predicted Mobile VHF Coverage Map



Existing Sites

Existing Coverage

New Coverage

Recommended Portable Enhancement Towers BFY2017/2018 & BFY2019/2020

PCE Site Evaluation Criteria Addendum

(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 PCE 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 user's experiences and testing.

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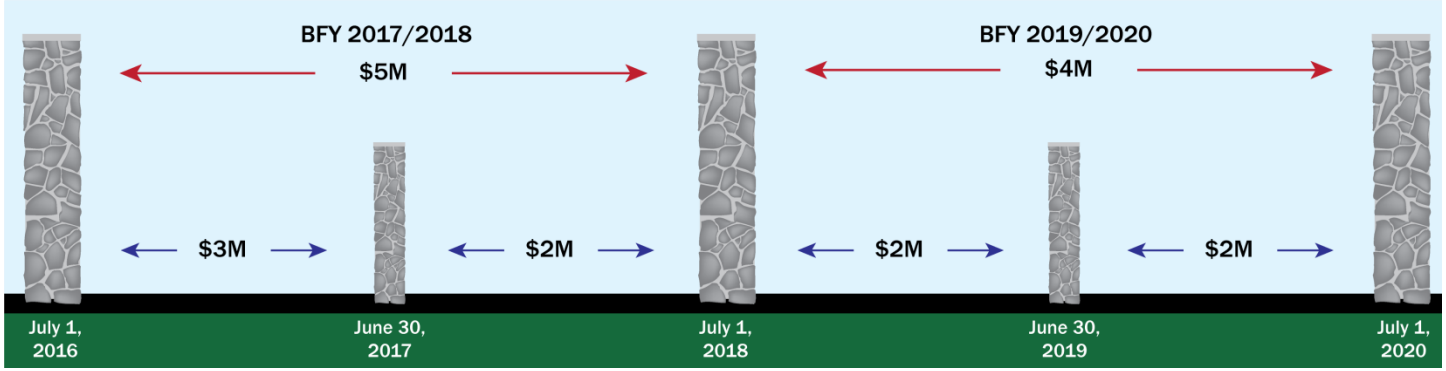
Potential Portable Enhancement Towers 2017/2018

1) Rock Springs – Population: 23,036
2) Evanston – Population: 12,359
3) Jackson – Population: 9,577
4) Buffalo – Population: 4,585
5) Newcastle – Population: 3,532

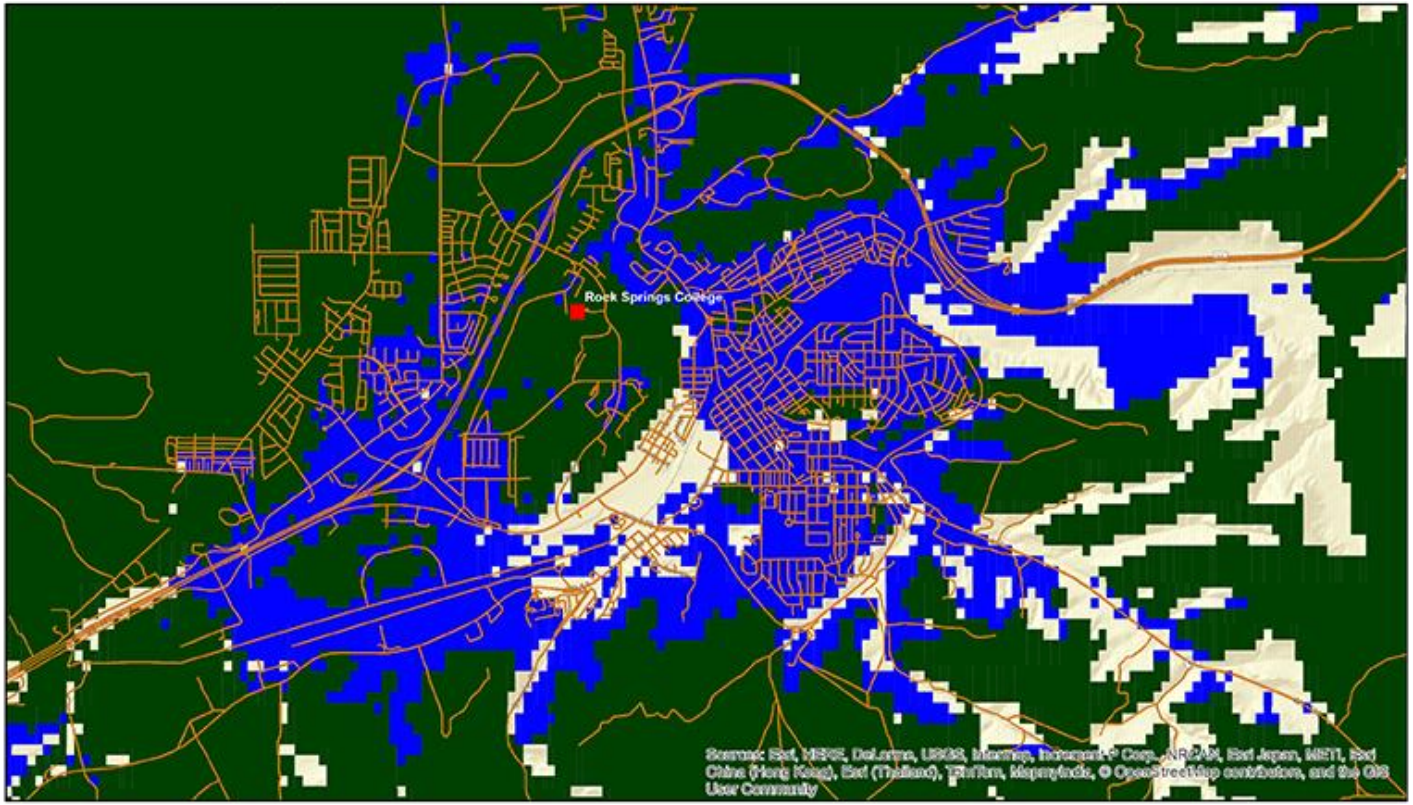
Potential Portable Enhancement Towers 2019/2020

1) Sundance – Population: 1,182
2) Greybull– Population: 1,847
3) Lusk – Population: 1,567
4) Wright– Population: 1,807

Note: One-time Funding



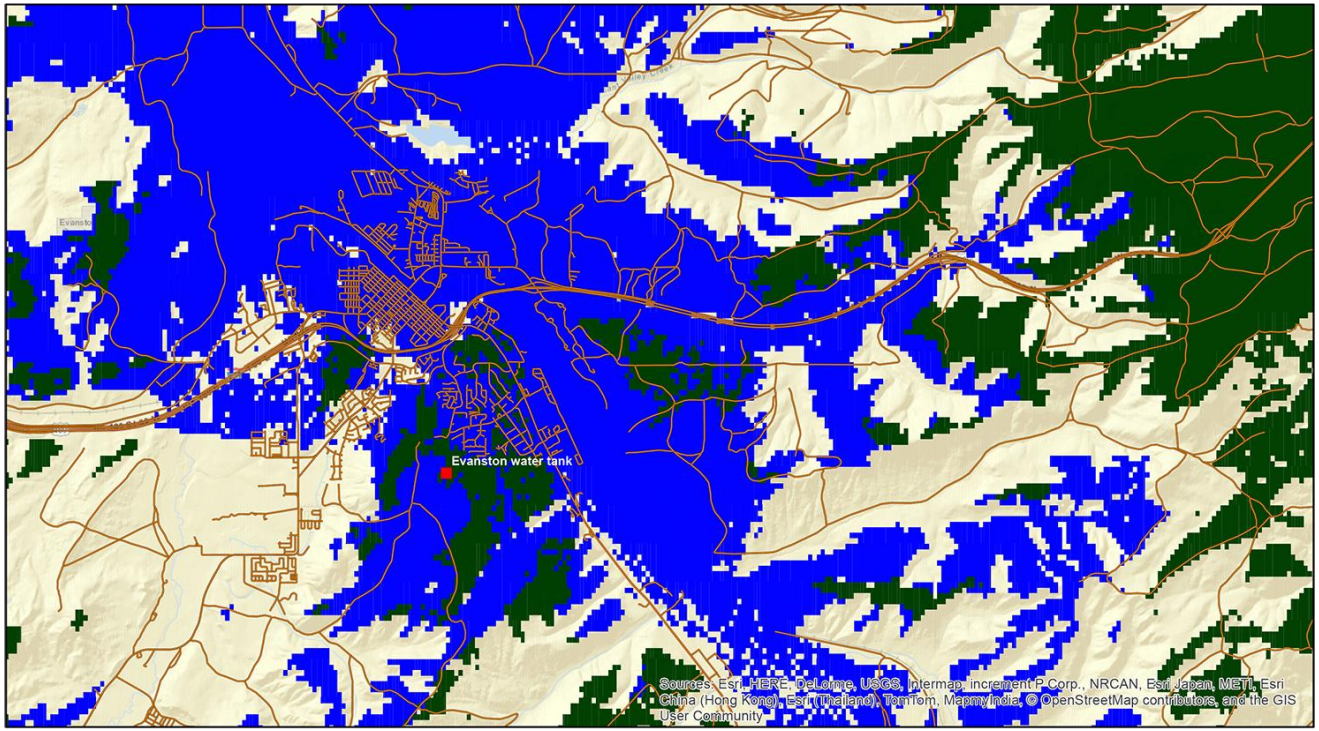
Predicted Portable VHF Coverage Map – Rock Springs



Existing Coverage

New Coverage

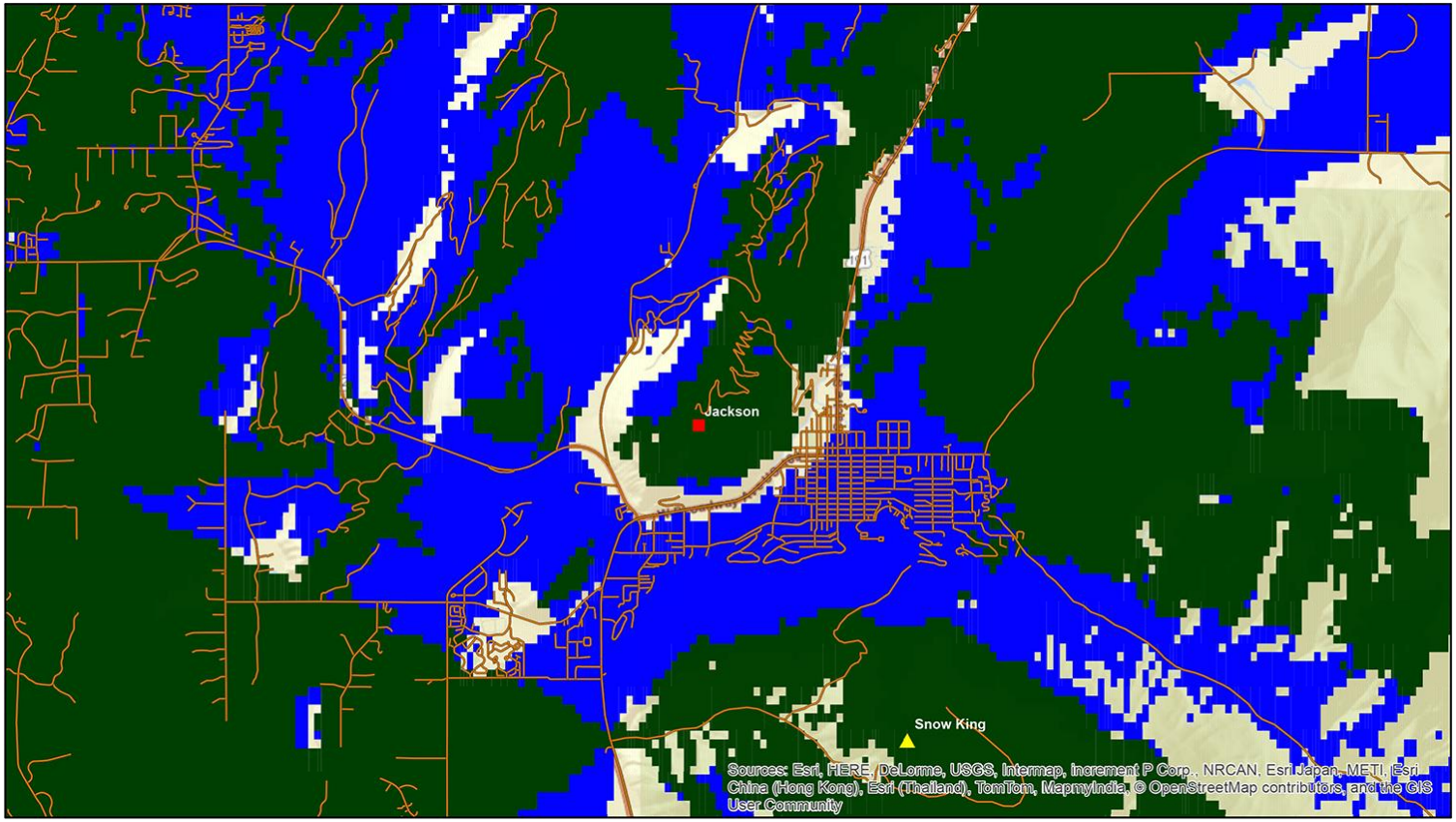
Predicted Portable VHF Coverage Map – Evanston



Existing Coverage

New Coverage

Predicted Portable VHF Coverage Map - Jackson

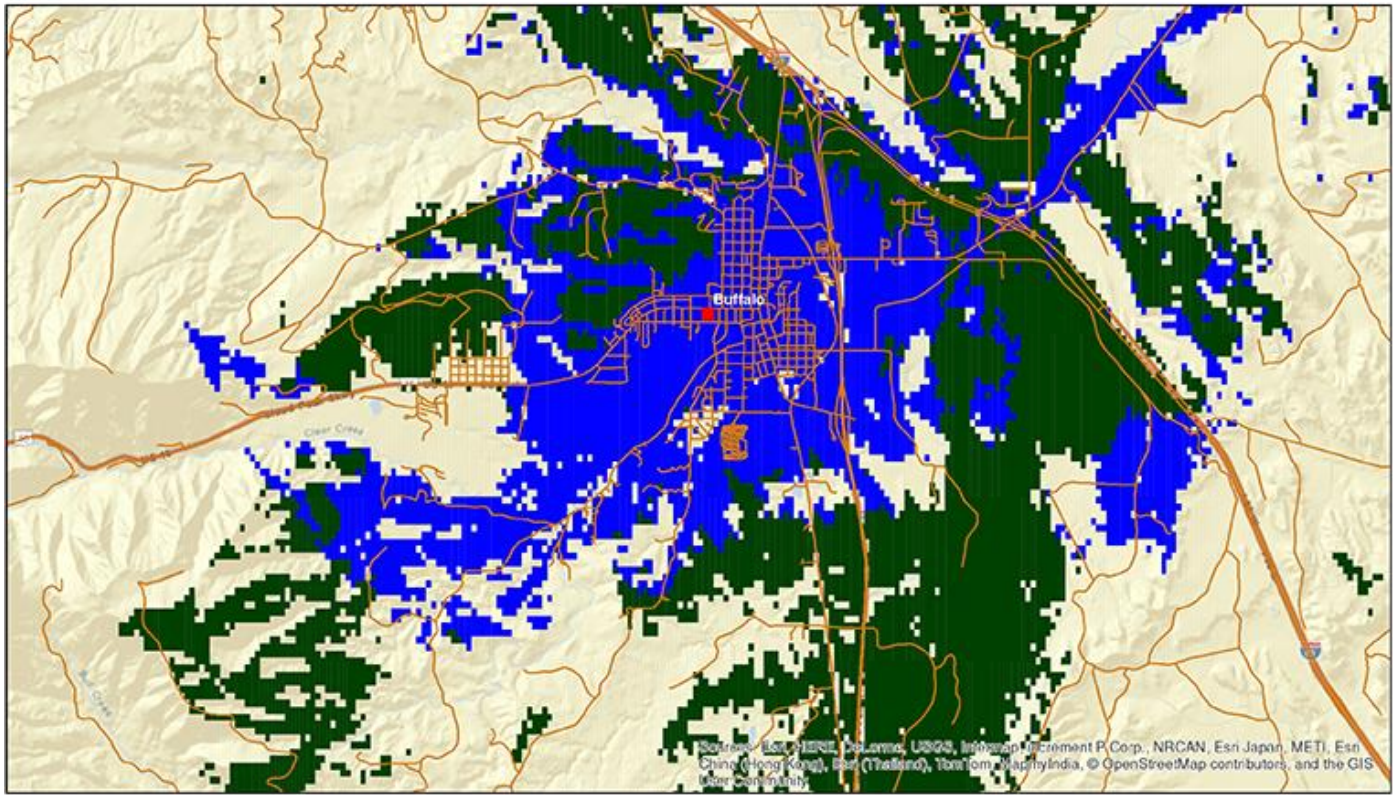


Existing Sites

Existing Coverage

New Coverage

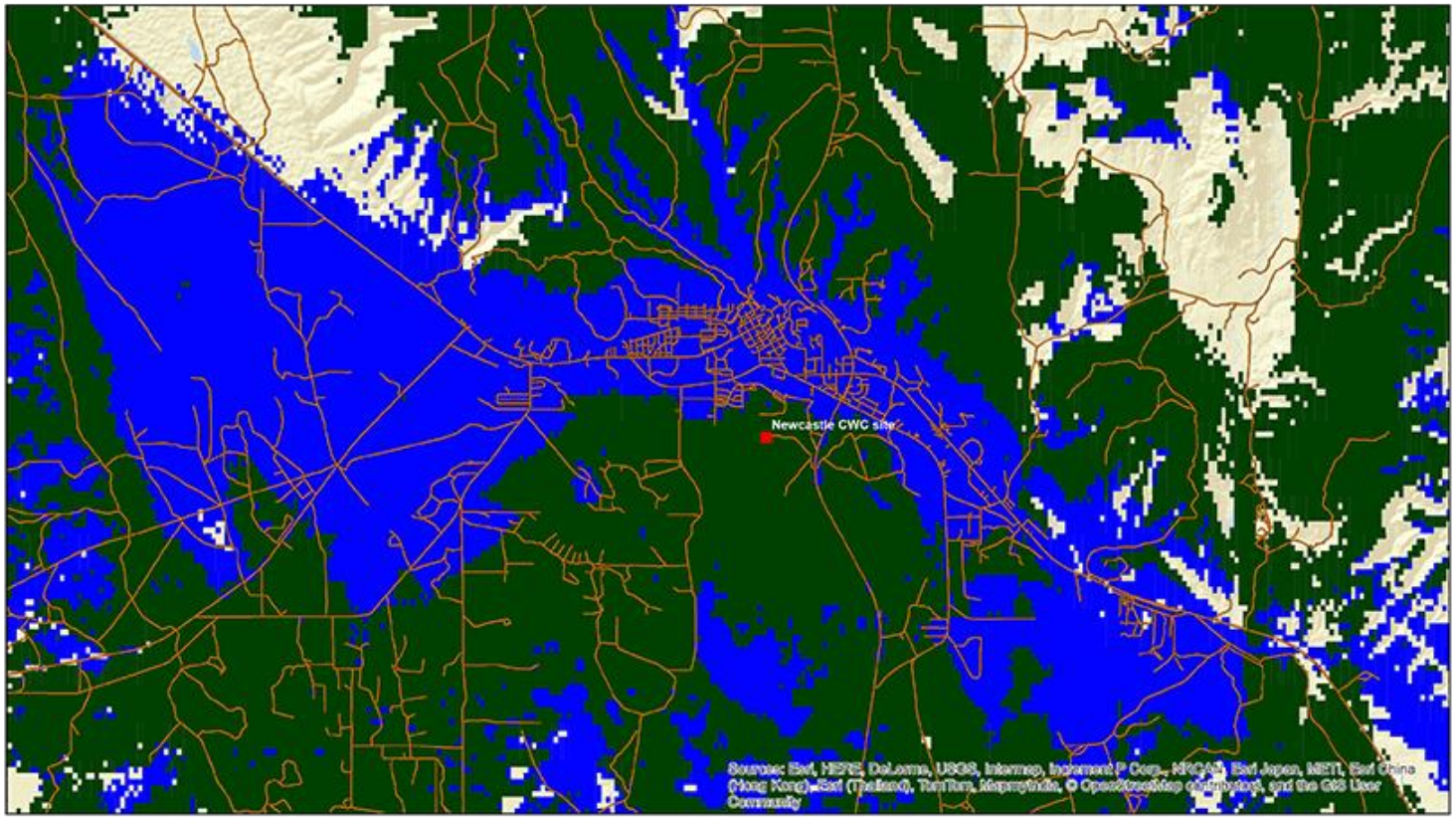
Predicted Portable VHF Coverage Map – Buffalo



Existing Coverage

New Coverage

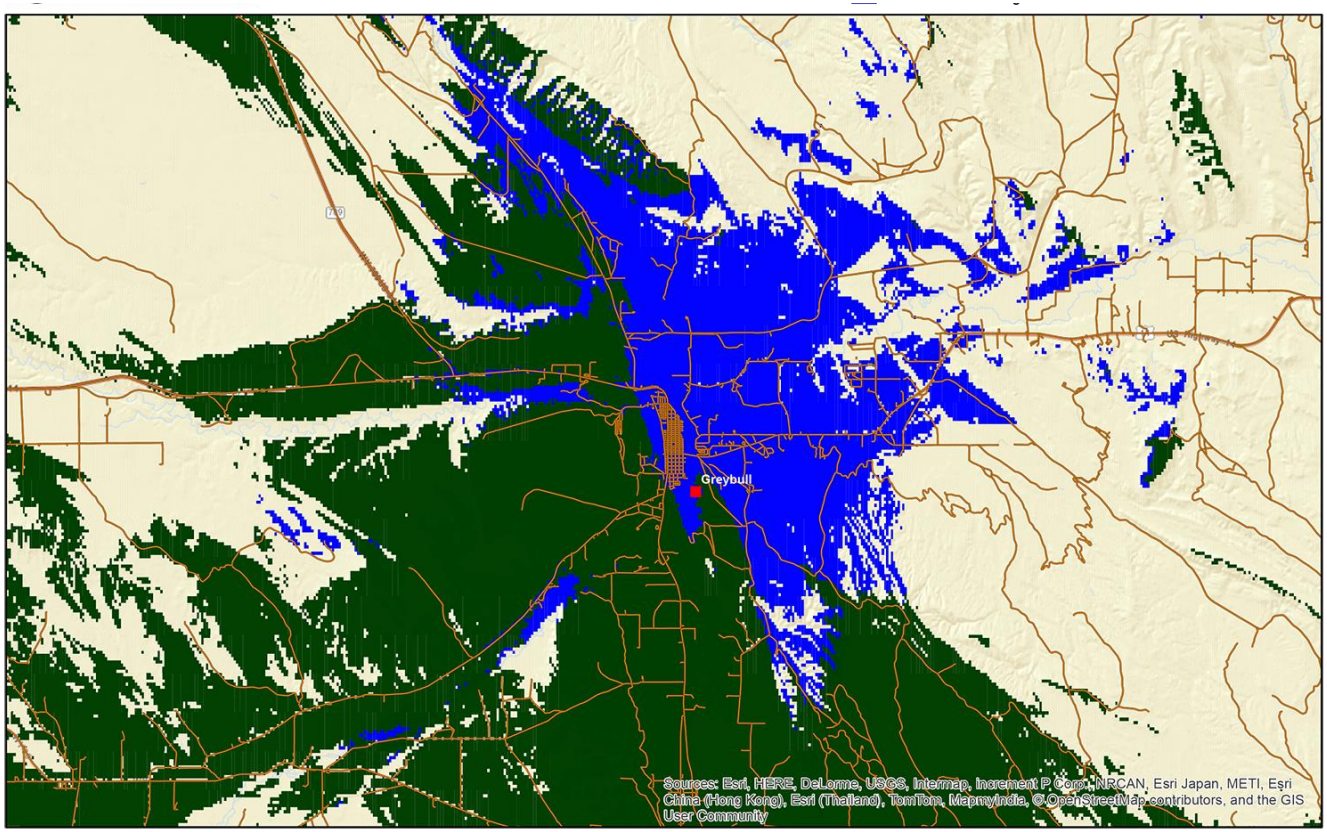
Predicted Portable VHF Coverage Map – Newcastle



Existing Coverage

New Coverage

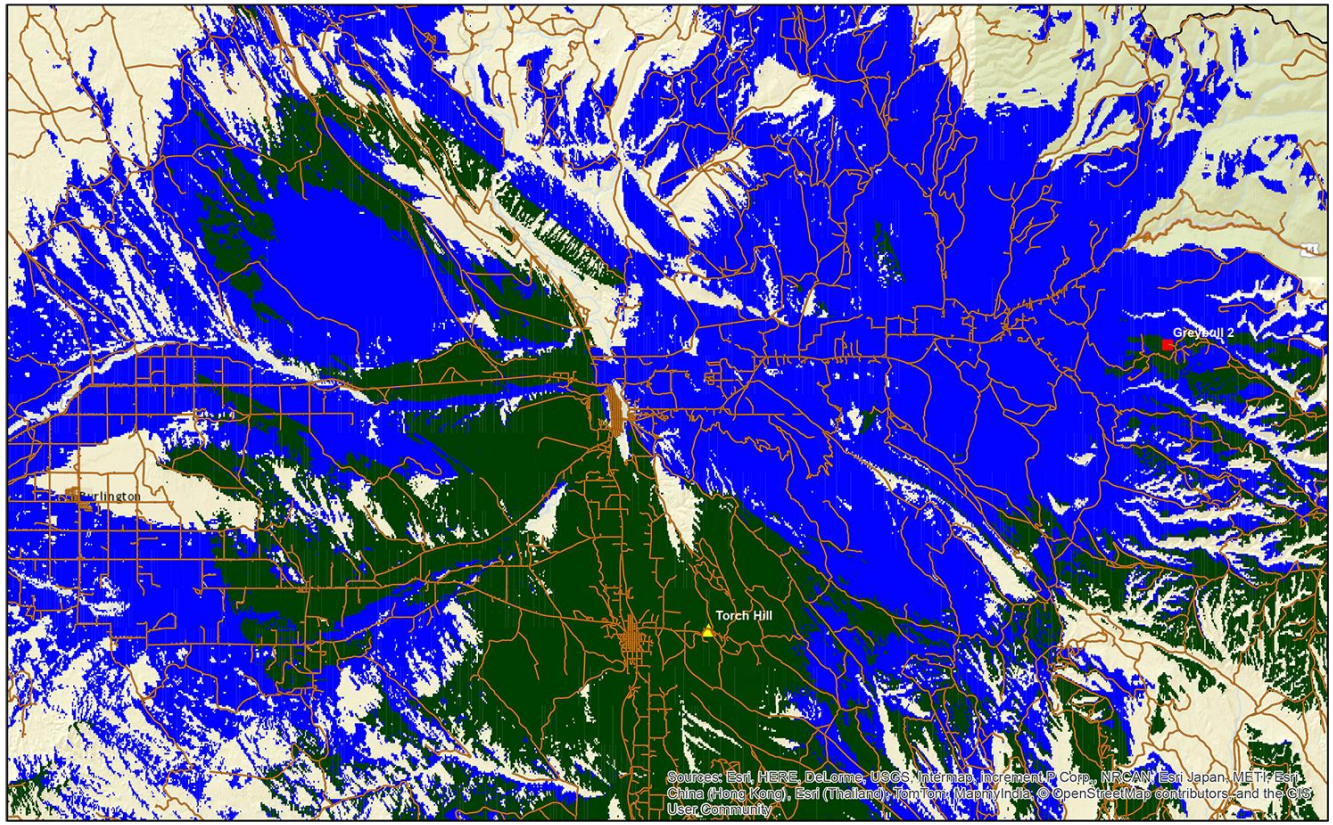
Predicted Portable VHF Coverage Map – Greybull



Existing Coverage

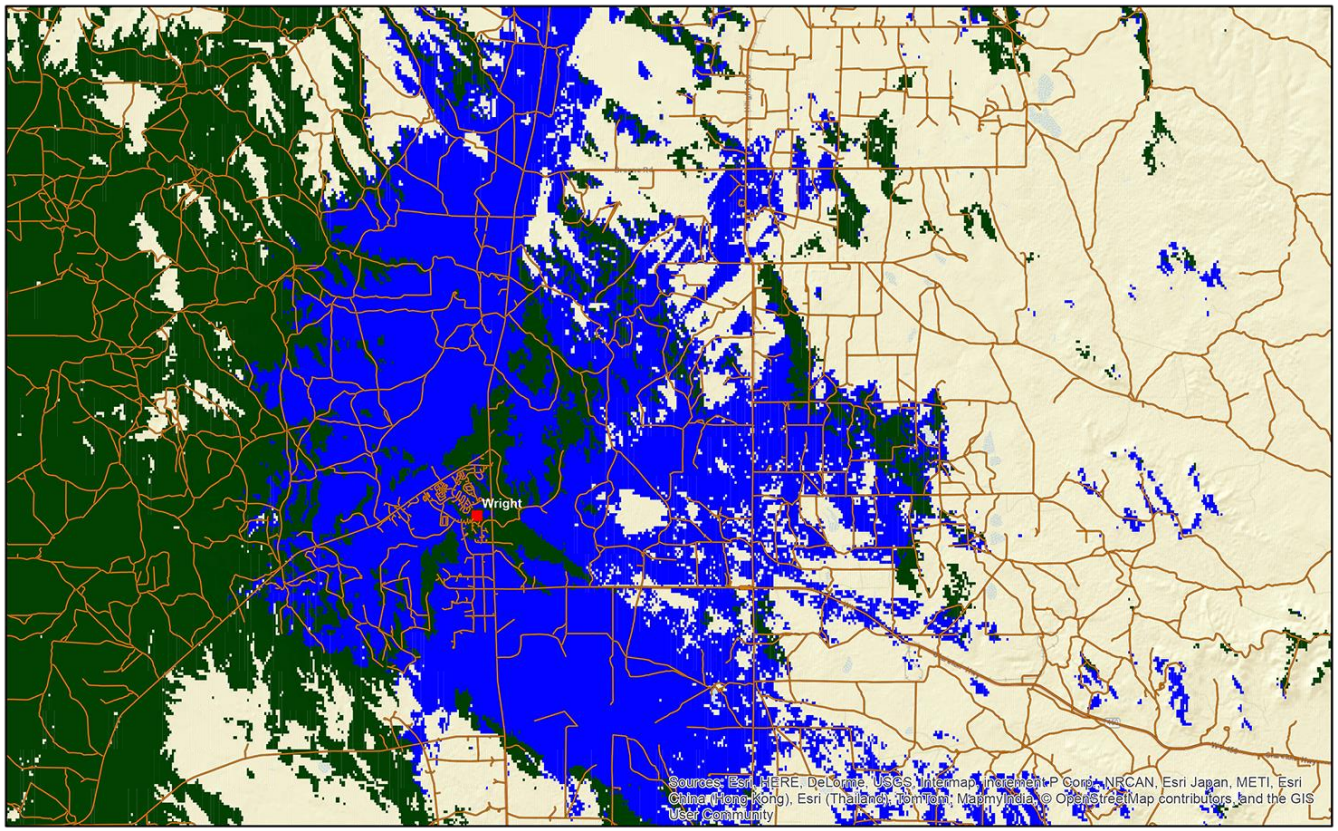
New Coverage

Predicted Portable VHF Coverage Map – Greybull Continued



Existing Sites | Existing Coverage | New Coverage

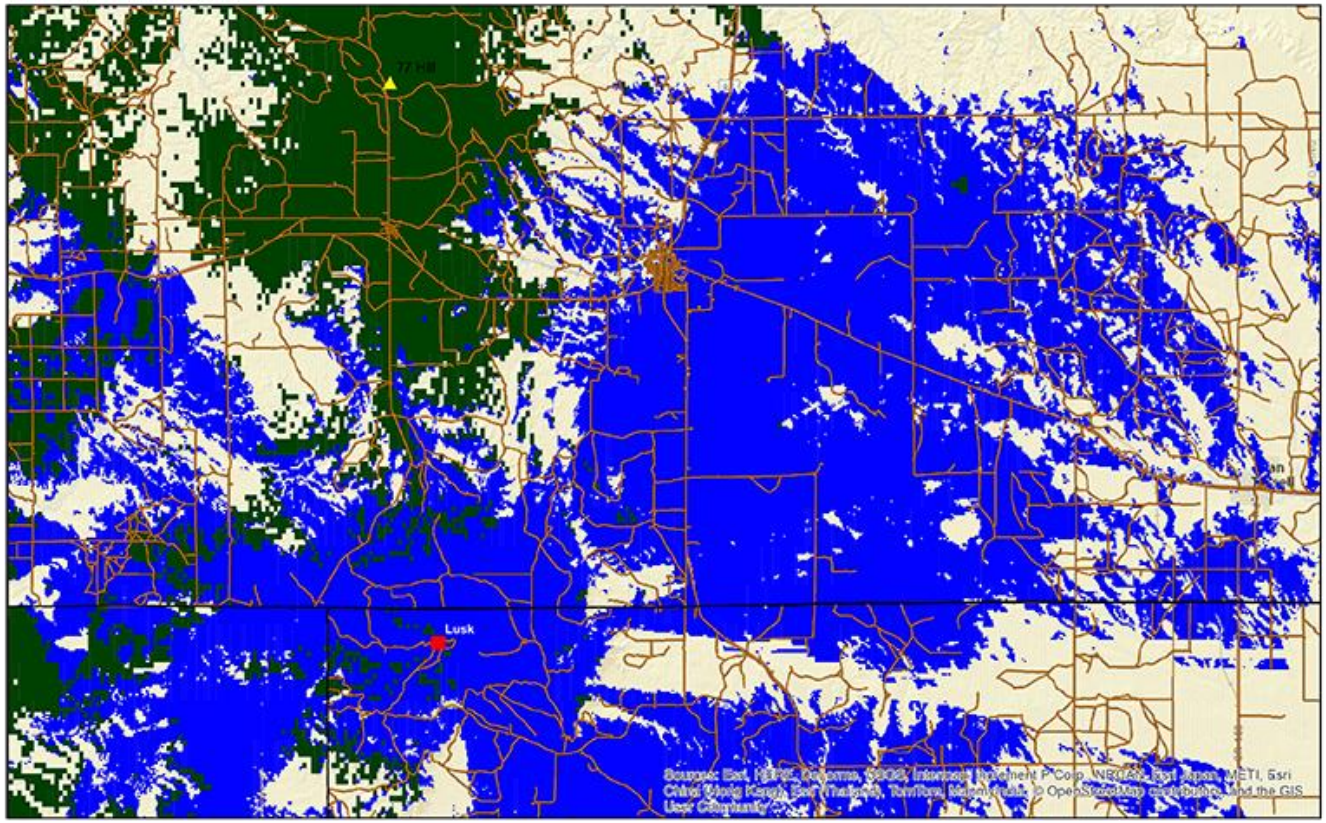
Predicted Portable VHF Coverage Map – Wright



Existing Coverage

New Coverage

Predicted Portable VHF Coverage Map – Lusk

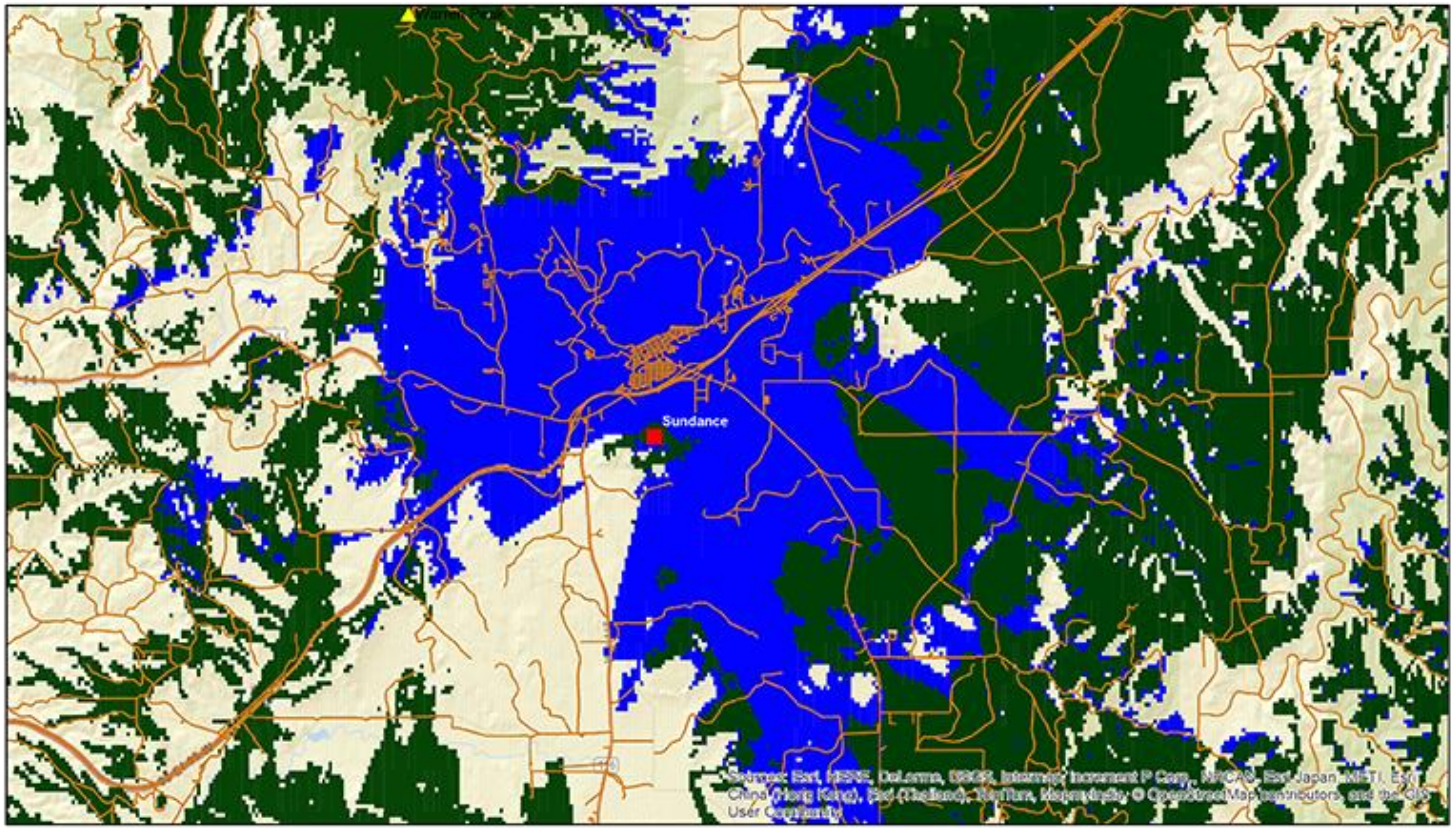


Existing Sites

Existing Coverage

New Coverage

Predicted Portable VHF Coverage Map – Sundance



Existing Sites

Existing Coverage

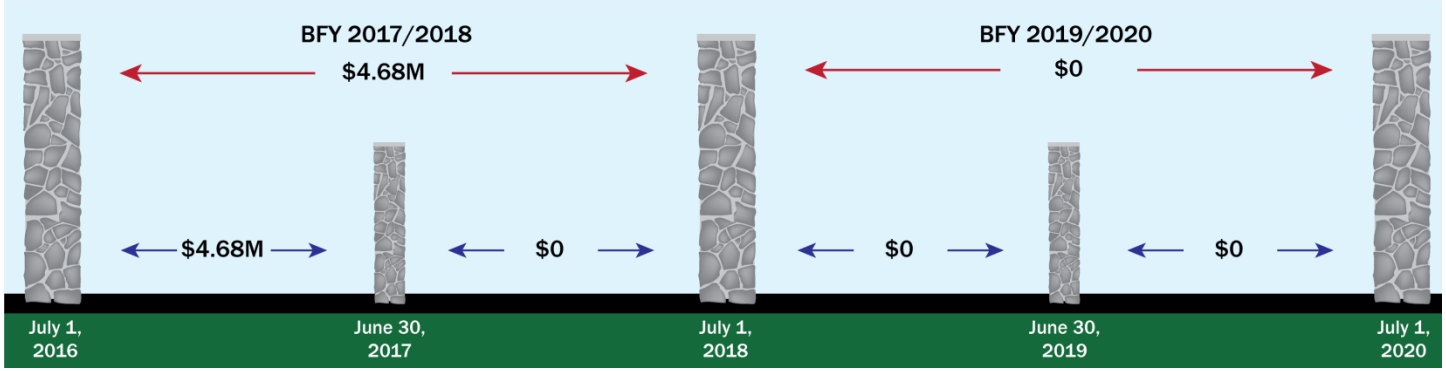
New Coverage

Dispatch Center Consoles

Date	WyoLink Version	Equipment	Event	# of Dispatch Center Consoles	# of Seats	Estimated Replacement Cost
8/1/2016	7.16	CentraCom Gold Elite Consoles	CentraCom Gold Elite Consoles NOT supported	13	40	$4,680,000

- Providing competition from more than one vendor should reduce the capital outlay for the replacement of Gold Elite Consoles.

Note: One-time Funding



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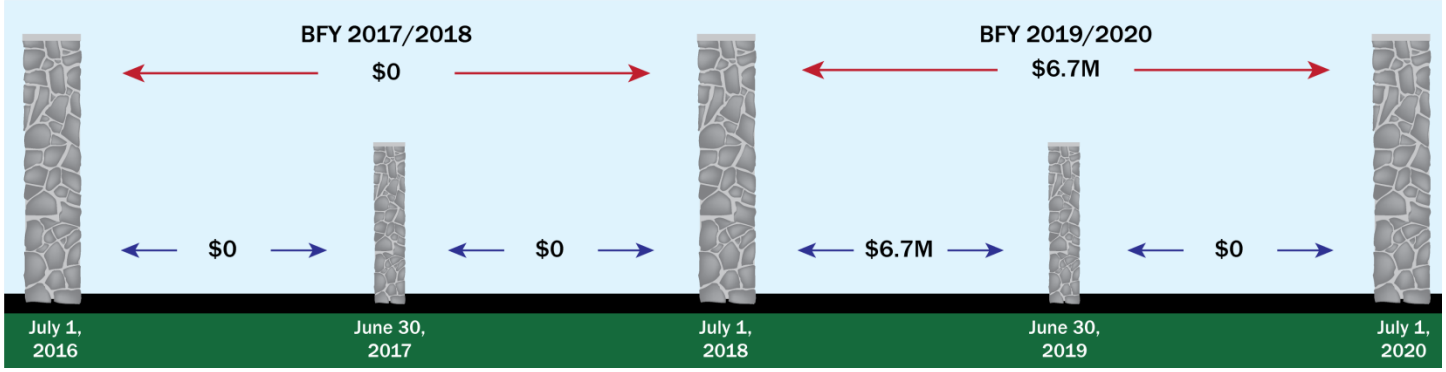
Hardware Replacement

- 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.
- 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.
- There is nothing on the horizon that suggests anticipated system updates which render older hardware obsolete for the near term once the aforementioned changes occur. However, the standards for this technology continue to evolve and the rate of change observed with computer-based systems like WyoLink remains fairly rapid. Therefore, technological advancements could occur which may result in some level of future periodic equipment replacements.

Date	WyoLink Version	Equipment	Event	Estimated Replacement Cost
8/1/2018	7.18	Quantar Base Radios	Quantar Base Radios NOT Supported	$6,700,000

Base repeaters, Mountaintops & portable coverage enhancements.

Note: One-time Funding



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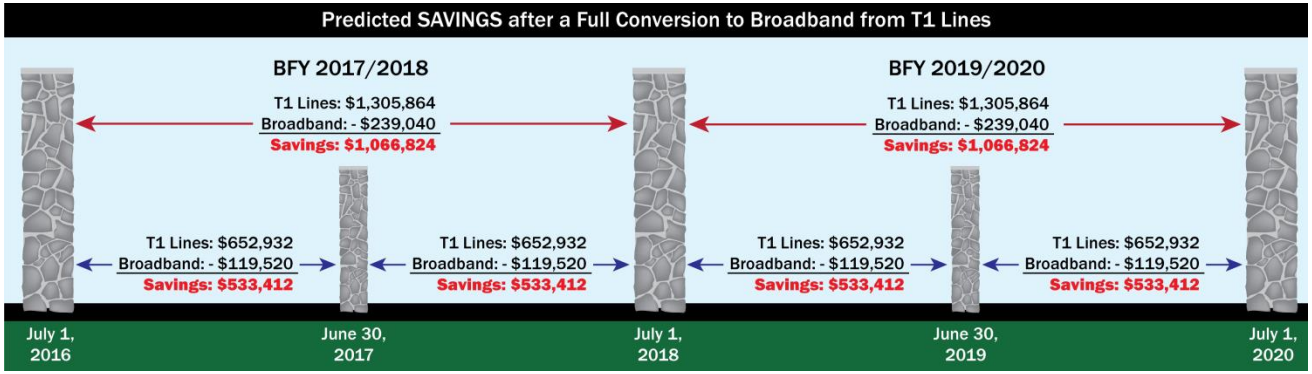
T1 Line Conversion to Unified Network

- The current Monthly Cost of Leased T1 lines is $54,411
- Quick Conversion is leasing a T1 circuit from the Unified Network point of presence in that locality to the console location.
  - Estimated Monthly Cost after Quick Conversion - $10,970
- Full Conversion is placing a Unified Network point of presence at the console location.
  - Estimated Monthly Cost after Full Conversion - $9,960

A conversion from leased T1 lines to a Broadband Unified Network could result in savings of approximately $1,066,824 per biennium after a payback of initial upfront costs.

Caveats

1. The technical feasibility of replacing each leased T1 circuit with a Wyoming Unified Network connection needs to be verified and carefully planned, including means of last-mile connection.
2. It is not certain when this spreadsheet estimate of $43K/monthly savings will begin to accrue. It will be refined based on accurate service provider quotes and site surveys, which should exist by the end of March 2015. Full realization of recurring cost savings may take longer than projected; past network reconfigurations often took longer to accomplish than hoped and unforeseen costs sometimes arose, such as penalties for early termination of leased T1 circuits or extra last-mile costs.
3. WYDOT Telecommunications will research use of the Wyoming Unified Network to allow for future public safety applications. For example, configuring it to accommodate future microwave and other network interconnections that would extend service and increase reliability.
4. There could be potential revisions from the current biennium (15/16).



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On-going Costs

	2017	2018	BFY 2017/2018	2019	2020	BFY 2019/2020
Hardware Maintenance	$975,898	$1,015,731	**$1,991,629**	$1,035,330	$1,077,589	**$2,112,919**
Software Maintenance	$1,323,495	$1,341,490	**$2,664,985**	$1,354,060	$1,367,085	**$2,721,145**
Past T1 Line Costs	$652,932	$652,932	**$1,305,864**	$652,932	$652,932	**$1,305,864**
Saving Switching to Broadband from T1 Lines*	($533,412)	($533,412)	**($1,066,824)**	($533,412)	($533,412)	**($1,066,824)**
Total	**$2,418,913**	**$2,476,741**	**$4,895,654**	**$2,508,910**	**$2,564,194**	**$5,073,104**

NOTE: Standard budget for ongoing costs including, and limited to: hardware maintenance, software maintenance, and on-going broadband costs.

*A conversion from leased T1 lines to a Broadband Unified Network could result in savings of approximately $1,066,824 per biennium **after a payback of initial upfront costs**.

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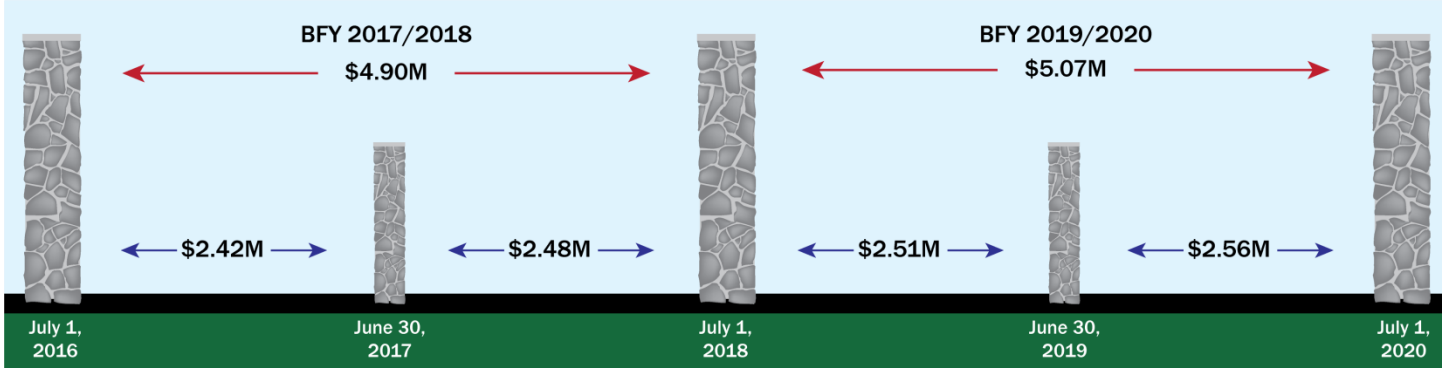
Note: Seeking Standard Budget



Mobile and Portable Radios

- This has been a Local Government issue in the past, however, Federal Homeland Security Funding was a major source of revenue and the future is unknown as to how much funding will be available.

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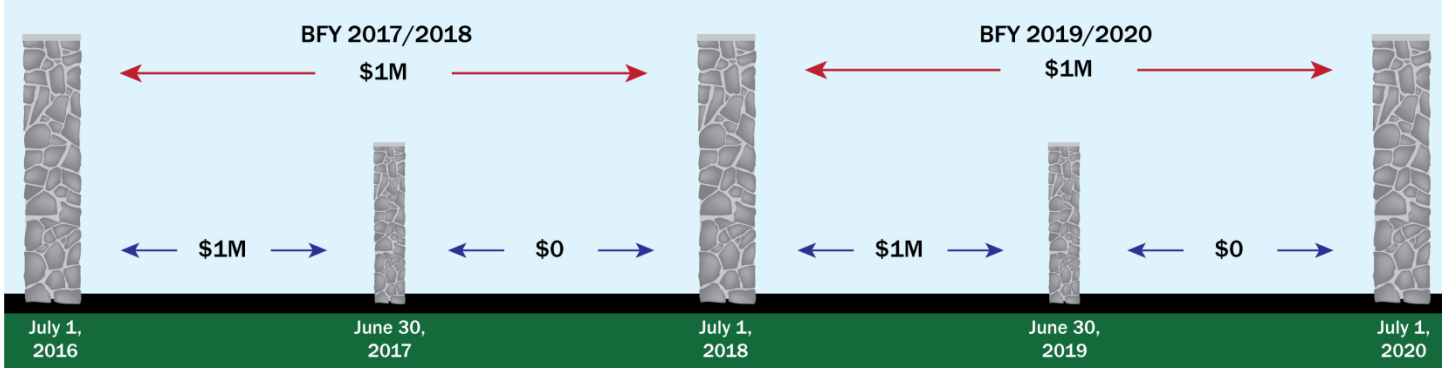
Note: One-time Funding



Training

- Upgrade online, user friendly manual
- Continue to include videos
- Explore a help desk available during business hours
- Continue train-the-trainer training
- Seek out those who want training on a regular basis
- Training certification and routine qualification testing

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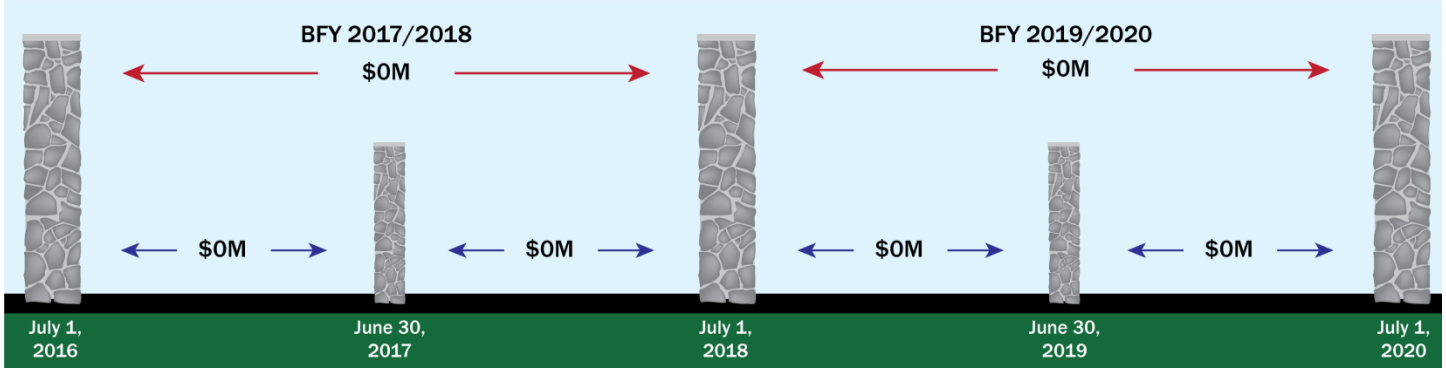
Note: Will Complete with Existing Resources



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.

- The PSCC will add VHF frequency coordination and licensing to the Spectrum Work Group tasks.

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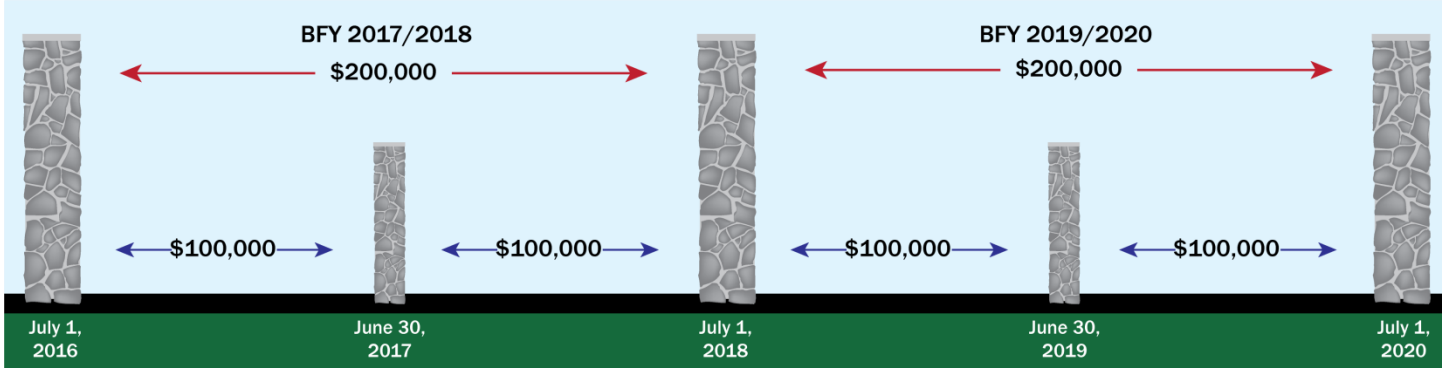
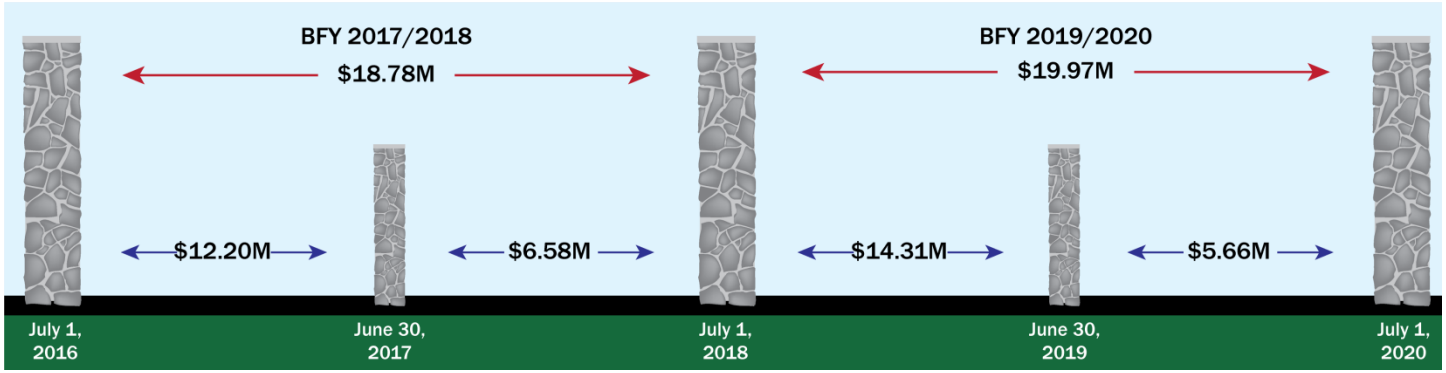
Note: One-time Funding



Needs through BFY2017/2018 & BFY2019/2020

Recommendation	BFY 2017/2018	BFY 2019/2020
Core Towers	$3,000,000	$3,000,000
Portable Enhancement Towers	$5,000,000	$4,000,000
Dispatch Center Consoles	$4,680,000	$0
Hardware Replacement	$0	$6,700,000
On-Going Costs	$4,895,654	$5,073,104
Mobile & Portable Radios	$1,000,000	$1,000,000
Training	$0	$0
Frequencies	$200,000	$200,000
Total	**$18,775,654**	**$19,973,104**

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