# Montana Statewide Public Safety Radio system report

## Introduction

Law enforcement, fire, EMS, and other agencies need to communicate over a radio system to execute their daily operations in responding to 911 calls from citizens. Without a reliable radio communications system, the ability for Public Safety to respond to a 911 call will be significantly reduced. Reliable communication becomes even more critical during emergencies and mutual aid situations. The need for interoperability escalates with larger scope or less common situations. The Department of Homeland Security has published guidelines and objectives for achieving interoperability and Montana's current Statewide System delivers the highest level of interoperability as defined by the Department of Homeland Security.

To facilitate interoperability, statewide networks enable local agencies to leverage existing statewide assets. States across the US have taken a leadership role deploying and managing these systems to enable the highest level of interoperability for local Public Safety agencies and the citizens they protect. This shared model improves State and Federal interoperability with local agencies and can reduce local costs. Lack of coverage, cost or other reasons sometimes prohibit local agencies from the interoperability of a shared, statewide system.

Similar to nearly every state in the USA, Montana currently has a radio system that provides statewide interoperability for Federal, State and Local users. The importance of these networks to Public Safety require a high level of reliability and fast restoration should an outage occur.

Unlike every state, Montana's statewide system has grown out of initiatives by locals and the Montana Highway Patrol. As a result, there is no formal statewide coordination of this critical Public Safety asset. HB 604 was intended to evolve that approach for a variety of reasons. including:

1. Alignment with the Governor's executive order 09-2016, which promotes the sustainment of existing state systems/infrastructure and encourages the convergence of systems for cost-effectiveness and operational efficiency.
2. Statewide coordination of an efficient, implementable plan for sustainment and evolution of the system to benefit all public safety agencies

## Current Situation

Montana's Statewide Public Safety Radio system processes over 10M calls per year, a 10% increase from May 2017 to May 2018. The system consists of 5 main elements:

1. "Core" computer equipment that operates the network
2. Tower sites – 59+
3. Consoles for dispatchers- 11 sites across the state, with over 50 total console positions
4. Radios for users- over 8000 State, Local & Federal
5. Microwave backhaul network that connects all sites and dispatch consoles to the Core.

Over the last 18 years, State and local agencies have invested over $45M in the five elements of the system defined above. Beyond those items, investments in the steel towers, concrete equipment shelters, and other construction elements brings that total to over $90M.

As a result of the limited funding to sustain the network over the years, the current system has elements that are not available as replacement parts, and/or are no longer supported by the vendor.

1. Nearly every radio site has unreplaceable Hewlett Packard equipment and soon to be discontinued Motorola equipment.
2. Nearly every dispatch center has out of support software from Microsoft.
3. The system core requires an upgrade for supportability.
4. The Microwave network is out of support and in need of an upgrade refresh.

Local agencies and MHP have done a commendable job keeping the system operational. In some cases, replacement parts have had to be sourced through ebay. The system vendor, Motorola, has advised they will provide reasonable assistance should an outage occur, but third party elements from Microsoft and Hewlett Packard are beyond their control.

## Outage impact

As an example, two of the many critical capabilities the system provides for Public Safety communications are:

1. Wide Area Communications
    a. Any radio user operating on the system across the state can communicate with other radio users and dispatch centers within the county, with bordering counties, with other counties in the region, even statewide.
    b. Can operate in a "conventional" or "trunking" mode- the differences in mode are immaterial to the need for supportability of the system.
    c. Critical to a variety of Public Safety scenarios, including vehicle pursuit of a suspect.
2. Dispatch Center backup
    a. Dispatchers have the ability to relocate to another dispatch location and pull up their dispatch console to maintain continuity of dispatch operations.
    b. Can operate in a "conventional" or "trunking" mode- the differences in mode are immaterial to the need for supportability of the system.

Three types of potential outages to consider:

1. Network core outage
    a. Lose ability for Wide Area Communications between radios users and dispatch
    b. Lose ability for Dispatch backup
2. Dispatch outage
    a. Lose the ability for both local communications and Wide Area Communications with radio users
3. Site outage
    a. Lose communication within that site's coverage area or for radio users back to dispatch.

4. Microwave outage
    a. Could result in any of the scenarios above.

These risks to reliable interoperable communications affect:

1. Local Sheriff's, PDs, FDs, and EMTs/Ambulances in: Gallatin County, Flathead County, Lewis & Clark County, Blaine County, Broadwater County, Silver Bow County, Cascade County, Hill County, Philips County, Toole County, Valley County, Roosevelt County, Sheridan County, Richland County, Dawson County, Fallon County, Fergus County, and Petroleum County; even school buses and public works in some counties.
2. Dispatch centers in Blaine County, Broadwater County, Butte-SilverBow, Cascade County, Flathead County Gallatin County, Helena, Hill County and Central Montana Dispatch would lose wide area communications capability.
3. State Agencies Montana Highway Patrol, MDT, F&G
4. Federal Agencies FBI, National Guard, Air Force, Border Patrol , Bureau of Land Management, Forest Service

## Recommendation

To ensure a reliable Public Safety Communications System, and to preserve the $45M investment, these supportability obstacles must be addressed. The state can leverage a significant portion of the current network by reusing over $20M of existing equipment, much of which has been funded locally. Equipment that can be reused includes existing user radios as well as elements of computer hardware and software at the dispatch centers, tower sites and the network core.

Beyond updating equipment, an upgraded system can also enable a variety of new operational enhancements to help improve Public Safety communications capabilities.

The cost of updating software and refreshing equipment that is out of support is estimated at up to $25M, or $3.2M annually if financed over 10 years:

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| Tower equipment upgrade: | $18M |
| Core Software upgrade: | $3.8M |
| Microwave System upgrade: | $3.2M |

Managing and supporting the system is estimated at approximately $3.6M annually:

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| Radio system warranty, support, maintenance, sustainability | $1.3M per year |
| Microwave Warranty, Maintenance, Parts | $1.35M per year |
| Labor 4 FTE, vehicles, equipment: $1,577,000 first year | $937k per year |

** these numbers based on Motorola Technicians performing all on site work and can be reduced with local technicians performing the work and an actual "bid" for the work items rather than an estimate

## Doing nothing

If the system is allowed to fall into disarray, State & Federal agencies will no longer have a statewide network to execute their communications requirements.

1. Every state in the region has a centrally managed and funded statewide radio system: WY, ID, ND, SD, CO, WA, OR, MN, IA, KS, NE, NV, UT, etc... Without a centrally managed & funded statewide radio system, Montana Highway patrol would join Nunavut, Canada & the Northwest Territories as one of the few States/Provinces without a coordinated statewide/province-wide Public Safety communications system.
2. Local agencies will have to purchase their own network core at up to $2M each.
3. Local agencies will also need to purchase their own tower site equipment, as well as upgrade or replace their dispatch consoles.
4. All shared assets would be replaced with standalone assets funded individually by each local agency.
5. The aggregate costs for these investments will land north of $40M, which by far surpasses the $25M required to upgrade the existing network.
6. Negative impact to officer safety leads to retention & recruiting challenges.

The biggest issue with doing nothing is the negative impact on interoperability. Not maintaining a statewide Public Safety communications system will introduce significant challenges for Public Safety agencies to deliver the same level of service to citizens across the state.