



800 MHz Upgrade



Legislative Task Force Study
Task Force Presentation
November 10, 2014
Joe Blaschka Jr., PE



UCA Radio System

- System is approximately 15 years old and is using proprietary technology
- System has been partially upgraded
 - New system controllers
 - 10% of the consoles have been upgraded
- Majority of the system is operating on manufacturer discontinued equipment that is nearing the end of parts availability



VHF Radio Systems

- UCA now supports the legacy state-wide VHF system
- Some rural agencies use the existing state system
- Some rural agencies have their own VHF system
- UCA to provide interfaces to existing systems where required



UCA Radio System

- Ability to maintain the existing 800 MHz system is becoming extremely difficult
- Implementation will take 5-7 years assuming aggressive implementation schedule
- Existing dispatch consoles are at end of life and must be replaced
- Main system controllers have been upgraded
- Supporting infrastructure (microwave, HVAC, generators, batteries) is also aging and should be upgraded or replaced



Task Force Process

- The Task Force was charged to study, develop, and operate an interoperable public safety radio network throughout Utah
- Obtain input from users throughout the state including interoperable partners (e.g., Federal agencies)
- Integrate VHF system information and rural requirements into system design
- Develop cost model based on high level system approach



Task Force Process

- Attended Task Force meeting in Richfield on June 23, 2014
- Attended Task Force meeting in Vernal on July 10, 2014
- Obtained additional information from rural areas
- UCA staff visited rural areas





Lessons Learned

- Reinforced the extensive use of VHF in rural areas visited
- There are significant areas without any radio coverage
- The existing systems can be complex to use
- There are a significant number of low cost VHF radios in use by volunteer fire and SAR agencies



UINTAH FIRE



DISTRICT

**Uintah Fire Suppression
Special Service District**



Lessons Learned

- Cost is an important factor for all users
- Historically, the State of Utah has been assisting the rural agencies with VHF radio communications
- High degree of interoperability due to frequency sharing. Many use the same channels across agency boundaries
- Some agencies are willing to try the new technology
- Some entities have developed their own radio infrastructure
- Some entities have a high radio count due to large number of volunteers for SAR and Fire





Planning Considerations

- Interoperability – How is it defined?
- Transition planning will be critical so that VHF and 800 MHz can effectively interoperate
- Interfaces to surrounding states for mutual aid
- Interfaces to National Parks, Forest Service, and BLM
- Areas where there is no coverage either VHF or 800 MHz
- There are environmentally sensitive areas that will need special consideration





Cost Factors

- Radio equipment infrastructure
 - Replace existing system with P25 Phase 2 standards based technology
 - Enhance coverage in urban areas
 - Expand coverage in currently under and unserved areas (estimate 35-50 additional sites)
 - Interface between 800 MHz and VHF radio systems
- Dispatch Centers
 - Replace consoles
 - Logging recorder radios and interfaces
 - Interfaces to legacy VHF equipment



Cost Factors

- **Interconnection network**
 - Upgrade existing equipment much of which is manufacturer discontinued
 - Convert to an IP based network
 - Evaluate a mix of technologies and services based on cost, functionality, and reliability
 - Network management system



Cost Factors

- Replacement dispatch consoles at dispatch centers (approximately 205 positions)
- New radio site construction and/or upgrades for additional sites
- Existing site upgrades
 - Air conditioning systems
 - Generators
 - DC Power systems
 - Building upgrades
 - Tower strengthening
- Operation of existing system during implementation



Next Steps

- Obtain funding
- Draft and design a final plan for system replacement
- Continue to refine and complete cost model (on-going process)



Schedule

<u>Task</u>	<u>Duration</u>
▪ Complete cost estimate	▪ December 2014
▪ Initial design and planning	▪ 0-12 months
▪ Regional planning	▪ 6- 36 months
▪ Vendor negotiations	▪ 9-36 months
▪ System upgrades started	▪ 24 months
▪ System upgrades continue	▪ 18-84 months
▪ Estimated system completion	▪ 84 - 96 months



Cost Breakdown

- Site Development \$ 34,000,000
- Network/Transport \$ 25,000,000
- Radio Infrastructure \$151,000,000
- Dispatch Center \$ 16,300,000
- Engineering/PM \$ 13,400,000

- Total Infrastructure \$239,700,000



Estimated Capital Cash Flow

Estimated cash flow for infrastructure assuming no user fees

- 2015 - \$ 2,200,000
 - 2016 - \$18,900,000
 - 2017 - \$27,900,000
 - 2018 - \$50,300,000
 - 2019 - \$44,400,000
 - 2020 - \$38,600,000
 - 2021 - \$21,900,000
 - 2022 - \$21,800,000
 - 2023 - \$13,700,000
- Project finished



Estimated Operations Cash Flow

Estimated cash flow for on-going operations
assuming no user fees

- 2015 - \$ 7,900,000	- 2022 - \$10,400,000
- 2016 - \$ 8,900,000	- 2023 - \$10,600,000
- 2017 - \$ 9,300,000	- 2024 - \$12,800,000
- 2018 - \$ 9,700,000	- 2025 - \$29,200,000
- 2019 - \$19,800,000	- 2026 - \$13,200,000
- 2020 - \$11,100,000	- 2027 - \$13,500,000
- 2021 - \$10,200,000	- 2028 - \$13,700,000



Estimated Total Cash Flow

Estimated cash flow for infrastructure and on-going operations assuming no user fees. Average annual amount approximately \$29,000,000

- 2015 - \$10,100,000	- 2022 - \$32,100,000
- 2016 - \$27,800,000	- 2023 - \$24,300,000
- 2017 - \$37,100,000	- 2024 - \$12,800,000
- 2018 - \$60,000,000	- 2025 - \$29,200,000
- 2019 - \$64,200,000	- 2026 - \$13,200,000
- 2020 - \$49,700,000	- 2027 - \$13,500,000
- 2021 - \$32,100,000	- 2028 - \$13,700,000



Summary

- The existing system is nearing the end of its useful life and maintenance is getting difficult due to lack of spare parts
- Replacement is a 6-7 year process which means the process must begin in the immediate future
- Initial capital funding and on-going funding are required to replace and maintain the system as the technology changes in the future.



UCA System Upgrade

- Questions?
- Joe Blaschka Jr., PE