

Next Generation Radio System Needs Assessment & Strategic Communications Plan Erie County, Pennsylvania

MCM Consulting Group, Inc.

October 8, 2014

mcmconsultinggrp.com

Purpose

- Assess current communications systems & infrastructure.
- Assess current capabilities.
- Assess current interoperability capabilities.
- Survey/interview users of the system for strategic plan development.
- Develop a technical plan for future communications system & infrastructure.

Goal

- To provide for interoperability among the users & non users of the system.
- To migrate the County system and users to common platform.
- To provide a strategic plan for the future growth of the communication system.
- To provide the most technologically advanced communication system that meets the needs of Erie County in the most cost efficient way.

Assess Current Communications System & Infrastructure

- Who
- What
- Where
- How
- Why

Assess Current Communications System & Infrastructure

- Who uses the system?
- What works, what doesn't?
- Where is everything located?
- How does everything connect together?
- Why do things work the way they do?

Entities Surveyed/Interviewed

- 9-1-1
- Education
- EMA
- EMS
- Fire
- Law Enforcement
- Misc. (Governmental, Public Works, Etc.)
- Total = 70

User Surveys & Interviews

- Coverage & Capacity.
- Features & Functionality (Current & Future).
- Reliability & Stability.
- Use in high call volume & stress situations.
- Maintainability.
- Expansion Capability.
- Cost & Availability of Replacement Parts.

User Surveys & Interviews

- What Works Well Today.
- What Improvements are Needed Most.
- Radio Network Interoperability
Interagency & Interjurisdictional.
- Radio Network Subsystems
Base Stations, Portables, Mobiles,
Pagers, Cell Phones, etc.

User Surveys & Interviews

- What Improvements are most Needed & Why:

Year 1

Year 2

Year 3

Year 4

Year 5

Site Surveys & Inventory

- All transmit & receive sites were surveyed and the equipment inventoried:
- 35 Sites.
- 9-1-1 Center.

Key Findings

- Some key findings (based on frequency of response from agencies) from Phase 1 of the project include:
- Erie County does not have a county-wide radio system, it has a system of systems.
- A new county-wide radio system is needed for EMA, EMS, fire and police agencies.

Key Findings

- There is an underlying desire and need for interoperability among the users, bordering counties and Commonwealth agencies.
- Significant grounding and maintenance issues need addressed at the county radio sites.
- Radio coverage is inconsistent for many areas.
- Users of the system desire improved portable and mobile radio coverage.
- Portable in building coverage is a perceived issue almost everywhere.

Key Findings

- A consistent across the disciplines desire for more channels is expressed, including more operations channels.
- Users of the system expressed concern over issues in dispatching in high call volume times.
- An additional dispatcher is needed during times of high call volume and during large-scale incidents and weather emergencies.
- There are concerns about what is seen as channel capacity in heavy use disaster periods.

Key Findings

- Weather and time of year (seasons) affect the radio network performance.
- Lack of funding for capital and on going cost is the number one financial concern of both users and non-users of the system.

Site Surveys

- Site survey compilation was completed on 2/28/14.
- A prioritized list of site remediation tasks was submitted to the Erie County DPS to address.
- A new best practice installation & maintenance policy was instituted by Erie County DPS.

Vendor Presentations

- Vendor presentations took place in Erie County for Erie County DPS and user agencies.
- Motorola
- Tait
- Harris

Strategic Planning

- A Strategic Plan was developed based upon the result of the needs assessment, site surveys, equipment inventories, user surveys & interviews, propagation studies and the county's and consultants expertise.
- System designs and budgetary pricing for needed upgrades are included in strategic plan.
- The project plan was developed in a phased approach.

Other Items

- Maintained a bi-weekly project meeting schedule with officials.
- Made application to the FCC for some additional radio frequencies.
- Assisted with co-location on State owned tower sites.
- Prepared a preliminary “zoned” configuration map of the County.
- Located potential tower sites within those zones.

Technical Plan Time Line

- Immediate - 0 months to 6 months
- Short - 0 months to year 1
- Medium Term - Year 2 & year 3
- Long Term - Year 4 & year 5

Recommendations

- Create a common platform of operation by locating all agencies into a single band of UHF radio frequencies.
- The plan is for a 20 site, IP based, P25 Phase II trunked / simulcast configuration.
- Note: P25 is digital so one UHF “analog” channel will be needed for paging.

Recommendations

- Phase II allows two conversations at the same time on one channel which increases the capacity of the system and trunking increases the efficiency of the system by making use of idle channels.
- Simulcast allows the broadcasted signal to be heard over the entire County at one time or simultaneously.

Recommendations

- The system would be designed to provide 95% “portable” coverage over the entire County and within urban and suburban structures and including certain geographical areas, providing a minimum DAQ (delivered audio quality) of 3.4. This is to be achieved without the use of in vehicle repeaters.

Recommendations

- New console system that is compatible with the vendor supplied radio system.
- New “public safety rated” microwave backbone system.
- Manufactures maintenance agreements.
- Building of up to 11 tower sites to eliminate yearly rental fees.

Recommendations

- Referring to the attached map showing the existing “primary” tower sites and the County being divided into seven operational zones with the City of Erie being a zone unto itself. Each zone would have sufficient tower sites that would allow a “transmitted” signal to cover the zone on a 95% level to mobiles and portables in buildings. Receive signal levels from the portables can be enhanced with voting receivers.
- Most likely the sites picked for the zones would also be the same sites used for county-wide coverage.

Recommendations

The complete County wide trunked simulcast UHF coverage would include one (1) City of Erie fire dispatch channel, one (1) City of Erie operation channel, one (1) Millcreek Township fire dispatch channel, one (1) Millcreek Township operation channel, one (1) county-wide fire dispatch channel, five (5) zoned fire operation channels, one (1) fire “analog” UHF paging channel, one (1) City of Erie police dispatch channel, one (1) City of Erie police operation channel, one (1) Millcreek Township police dispatch channel, one (1) Millcreek Township operation channel, one (1) county-wide police dispatch channel, five (5) zoned police channels, one (1) MED dispatch channel, one (1) MED operation channel, one (1) MED command channel and one EMA channel. The EMA channel could also serve as the school bus emergency channel when school buses are being used as emergency evacuation vehicles.

Recommendations

- The system would have the capacity to support thirty four (34) volunteer fire departments, two (2) cities (Corry & Erie) police department, nineteen (19) police departments, one (1) Sheriff's department, EMA and EMS. Some of the agencies will require multi-channel access.
- In addition the system would be configured as to permit "direct" interfacing to other non-County entities such as local municipal public works departments, Federal and State communications systems, schools, colleges, airport facilities and neighboring County communications systems.

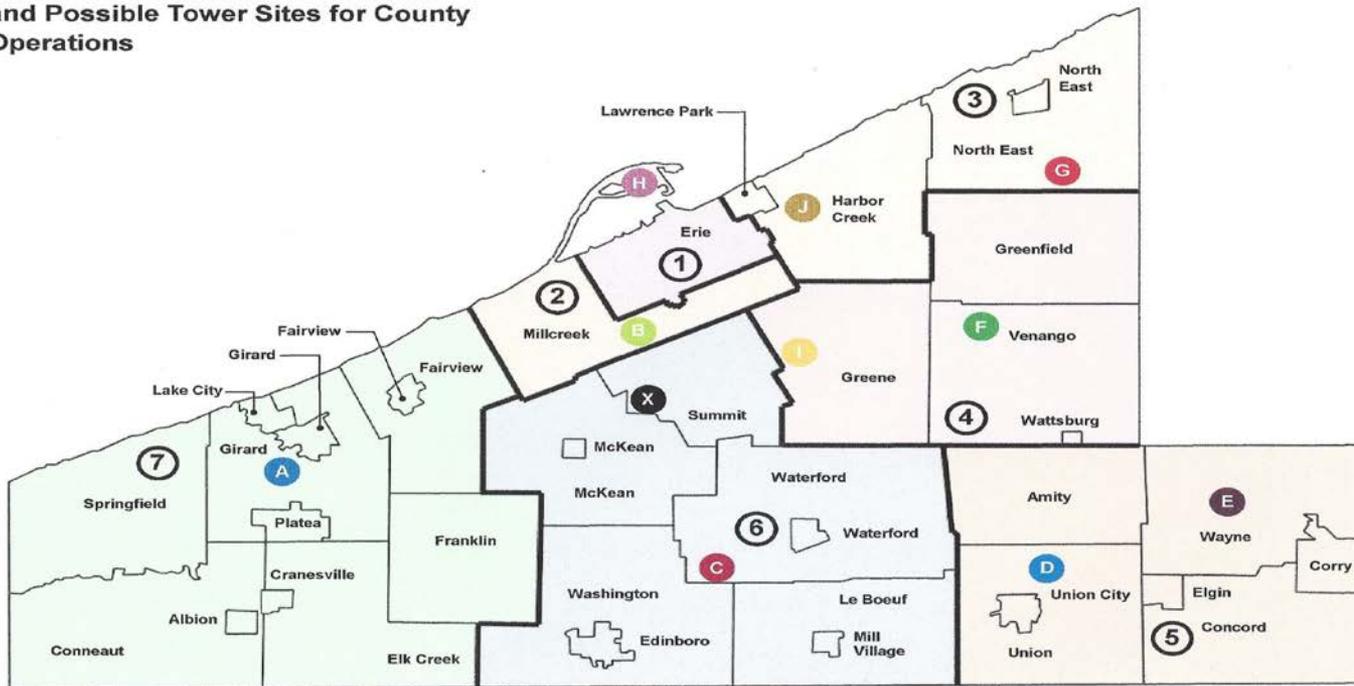
Recommendations

- It is also required that the system be of a robust design that failure of single component of the system “will not” render the system inoperable and access time for a channel must be minimal. Reliability and redundancy are key aspects of the systems operation.

Proposed Zones

Erie County

Proposed Communications Zones and Possible Tower Sites for County Operations



- | | | |
|---------------------------|-----------------------|--|
| A West County | E Buffalo Road | I WICU |
| B Hilltop | F Knogle Road | J East County Dispatch |
| C Sharp Road | G State Tower | X Flower Road - Control Stations Only |
| D Union City Tower | H State Tower | # Zones 1 - 7 |

Steps Since Last Update

- Presented the plan to the vendors and request a “budgetary” cost figure for County financial planning.
- RFI to Vendors.
- Review RFI’s from Vendors.
- Continued to acquire additional radio frequencies.
- Final Needs Assessment & Strategic Plan Report.
- Final Needs Assessment & Strategic Plan Report Presentation(s).

Subscriber Units

- MCM recommends that the county purchase the initial portable and mobile radios and pagers for the public safety agencies following the formula listed below:
- **Law Enforcement**
1 Patrol Vehicle = 1 Mobile, 2 Portables
- **EMS**
1 Ambulance = 1 Dual-head Mobile, 2 Portables
- Pagers = # of employees, per agency (i.e. ECI, MPS, WECEMA)

Subscriber Units

- Fire
 - Fire Chief = 1 Mobile, 1 Portable
 - Assistant Chief = 1 Mobile, 1 Portable
 - Deputy Chief = 1 Mobile, 1 Portable
 - Engine = 1 Dual-head Mobile, 4 Portables
 - Aerial = 1 Dual-head Mobile, 4 Portables
 - Rescue = 1 Mobile, 4 Portables
 - Tanker = 1 Mobile, 2 Portables
 - Brush = 1 Mobile, 2 Portables
 - Pagers = 25 per department (Average)

Subscriber Units

- Additional mobile and portable radios as well as pagers could be purchased by the individual departments at the discounted “bid” rate the county obtains from the winning system vendor.
- Several grant opportunities exist for funding for the mobiles, portables and pagers, including the Federal Assistance to Fire Fighters Grant and the COPS More Technology Grant. MCM recommends that the fire, EMS and law enforcement agencies collectively apply for these grants. Revenue received from the grants can offset the total cost incurred by the county.
- One final source of revenue could come from the Erie Gaming Revenue Authority.

Project Timeline

- October 2014 – September 2015 - FCC Licensing.
- October 2014 – September 2015 - Tower Location Scouting, Prepare for Acquisition of Land or Leases.
- January 2015 – December 2015 – IFB for Radio System/Award Contracts.
- January 2015 – December 2015 – IFB for Microwave System/Award Contracts.
- January 2015 – December 2015 – IFB for Towers & Shelters/Award Contracts.
- January 2015 – December 2015 – IFB for Tower Construction Services/Award Contracts.
- January 2016 – December 2017 – Project Implementation.

Cost

- Capital \$13,485,553.04
- Subscriber Units \$6,318,864.00
- Tower Sites \$4,620,000.00
- Project Management \$1,324,881.22
- Contingency \$674,249.70

- Grand Total \$26,442,988.96

