

# **1st Response Communication: Bringing Kosciusko County into the 21<sup>st</sup> Century**



## **Team Members**

**Kevin McSherry, Creighton Brothers**

**Jason McSherry, Kosciusko County**

**Jim Griest, 1st Source Bank**

**Andrew Manes, 1st Source Bank**

A volunteer firefighter is travelling southbound on Indiana State Road 13 just about to get into the town of Sidney. He comes over a hill and immediately spots two vehicles that were obviously just in a high speed collision. He fumbles around with his radio, not knowing for sure which channel he can be heard on or if he will even be heard at all given his location in the far southeastern part of Kosciusko County. He keys his radio and reports the accident to dispatch. What he hears in return is nothing. He quickly checks to make sure his radio is on the correct channel and begins to call in the accident again, as there is a very immediate need of assistance from ambulance and fire. Again, there is no response. Precious minutes are being needlessly wasted simply because the radio system that Kosciusko County currently has is out-of-date with gaping holes in coverage all over the county.

This fictitious example could one day be a reality and it's an unnecessary risk to take. In order to protect the life and property in this county to the fullest extent there needs to be a radio dispatch system that can more than adequately assist first responders, and the solution is a county-wide simulcast system.

The Federal Communications Commission (FCC) has mandated that "on January 1, 2013, all public safety and business industrial land mobile radio systems operating in the 150-512 MHz radio bands must cease operating using 25 kHz efficiency technology, and begin operating using at least 12.5 kHz efficiency technology. This deadline is the result of an FCC effort that began almost two decades ago to ensure more efficient use of the spectrum and greater spectrum access for public safety and non-public safety users. Migration to 12.5 kHz efficiency technology (once referred to as refarming, but now referred to as narrowbanding) will allow the creation of additional channel capacity within the same radio spectrum, and support more users.

After January 1, 2013, licensees not operating at 12.5 KHz efficiency will be in violation of the Commission's rules and could be subject to FCC enforcement action, which may include admonishment, monetary fines, or loss of license.” (fcc.gov). With this push to narrowbanding, range and a clear signal has been lost. The FCC has also mandated that at some time in the future there will be a transition to solely digital communications. This simulcast system will allow for such a transition.

There are approximately six hundred first responders (three hundred fifty firemen, one hundred medics, and one hundred fifty police officers) in Kosciusko County and are there to make a difference in any situation that may occur. It is these professional (and volunteer) responders that make a huge difference on-scene and need a system that provides clear communication.

It only takes one look at the map (page 7) of current coverage our county has right now to see that it is in definite need of an upgrade. There are holes in coverage in every corner of the county except for the northwest part. The map also very clearly illustrates the inability of the current system to transmit over the continental divide that runs through the northeast part of the county. The county elevation map (page 8) shows this very well. With these challenges (FCC narrowbanding requirements and the unique topography of Kosciusko County) now is the time to switch to a modern system that will no doubt save time in relaying communications between first responder and dispatch. This in turn may be able to save a property or even a life.

The main objection to making the switch to the simulcast system is the use of cell phones. That is, if the radio is not working properly the first responder can always just get his/her cell phone out and dial 911 like the public does. There are a couple of huge arguments to this line of thinking however. First, the caller is only able to speak to dispatch. One of the many

beauties of having a radio system in place is that when someone calls in an emergency (in theory) everyone is able to hear the call and react accordingly. Obviously with a cell phone this is not possible. Second, a huge advantage to having a radio is the ability to talk to fire/police/EMS that are en-route to an emergency. There is a lot of information that can be passed on to the responders through the use of radio. Again, with a cell phone this cannot be done. Another argument is the reliability of cell phones. There are some parts of the county that have limited or no cellular coverage. One can only imagine the helplessness that the officer in the illustration that began this paper would have if after realizing that dispatch was not able to hear his radio transmission, picking up his cell phone only to find that he was out of service. Many people complain very loudly to their respective cell carriers if they are not able to make phone calls or have their calls dropped due to the remote area they may find themselves in. If this is not acceptable for the public why should this be okay for the people who protect our property and lives?

The solution to this issue is a county wide simulcast system that has total coverage – no “dead zones.” This system allows for redundant linkages between all five towers in the county and it is spectrally efficient, meaning there is only one channel. The system operates on a redundant microwave (4.9 mhz) and will eliminate the current need of phone lines. This solution is superior to the current system in place in Kosciusko County in a number of ways: technology, coverage, narrowbanding, and future digital adaptability.

The simulcast system is also able to handle multiple agencies simultaneously – every call will be able to be heard by everyone in the county. Central dispatch will transmit on all five towers at the same time and all transmissions will be sent from every tower. Further, each agency would have their own frequency, and changing channels while moving throughout the

county is not necessary any longer. What is even more remarkable about this system is the redundant linkage between towers. What this means is that if one tower happens to go down (lightning, wind, etc.) the system will still function at near one hundred percent capacity. This simply could not happen with the current system.

A big roadblock to a simulcast system is the cost. A sophisticated system such as this comes with a large price tag. To implement the system with one agency (such as fire) would cost approximately \$520,000 (page 9). In our example of having fire, police, and EMS on this simulcast system the total cost would be approximately \$900,000. This proposed system has been reviewed by three independent engineers ensuring that it meets our county's unique topography and natural barriers. Our team is working on funding from grants, donations, and lease financing to help with the purchase of this system. Also, if our team was to win the Northenor Award, that money would be used to fund this project. Finally, this system has very low ongoing costs. There are no monthly tower costs or phone line bills. The estimated insurance of the system is approximately \$3,000 per year and the annual maintenance is expected to be \$3,500.

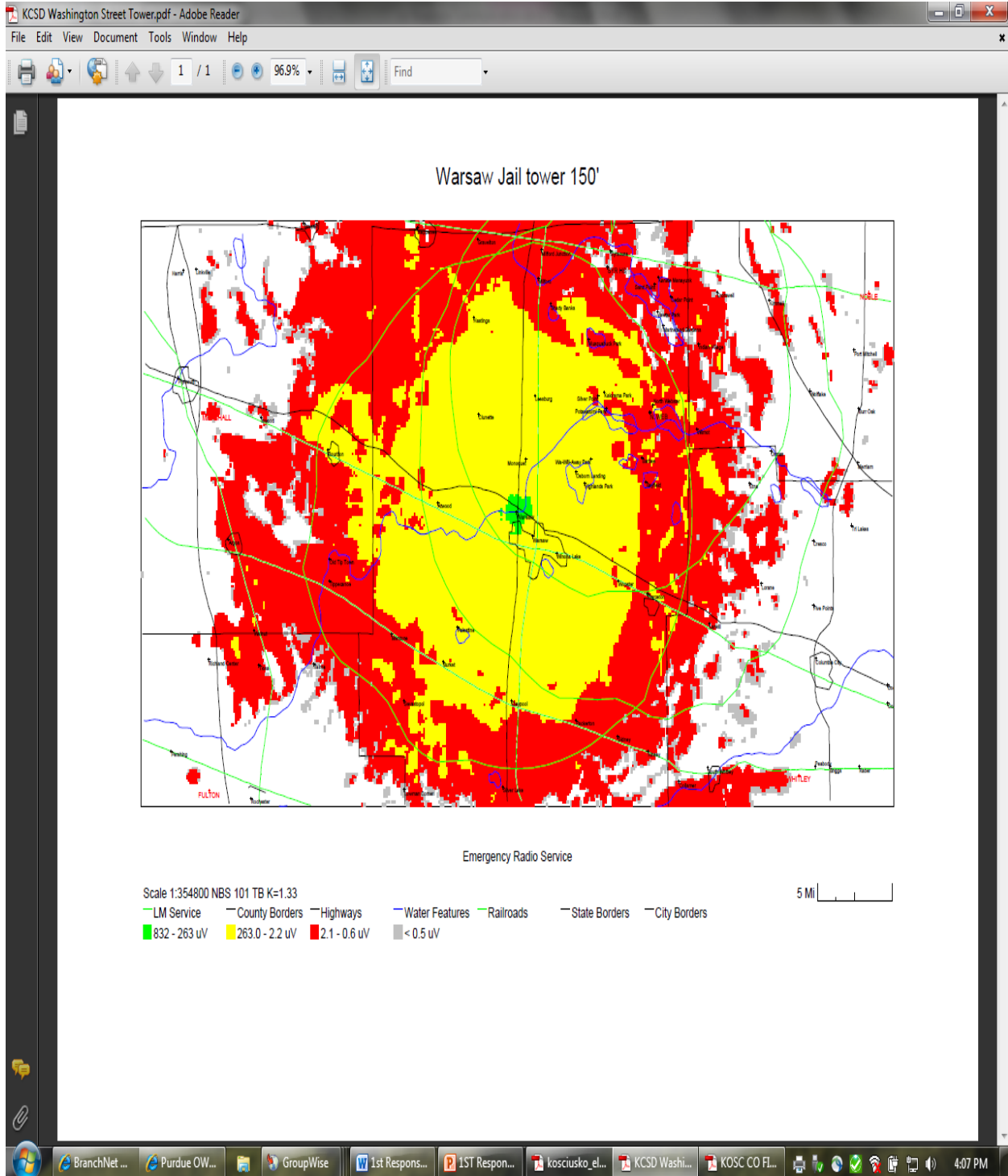
From Rock Lake in far southwestern Kosciusko County to Lake Wawasee in the northeast, and every point in between the message to and from the first responder must be heard. The system we use currently is out-of-date and not reliable. The county's only choice is to comply with the 2013 FCC narrowbanding mandate and begin implementation of the county wide simulcast system.

Works Cited

*Federal Communications Commission*. VHF/UHF Narrowbanding Information.

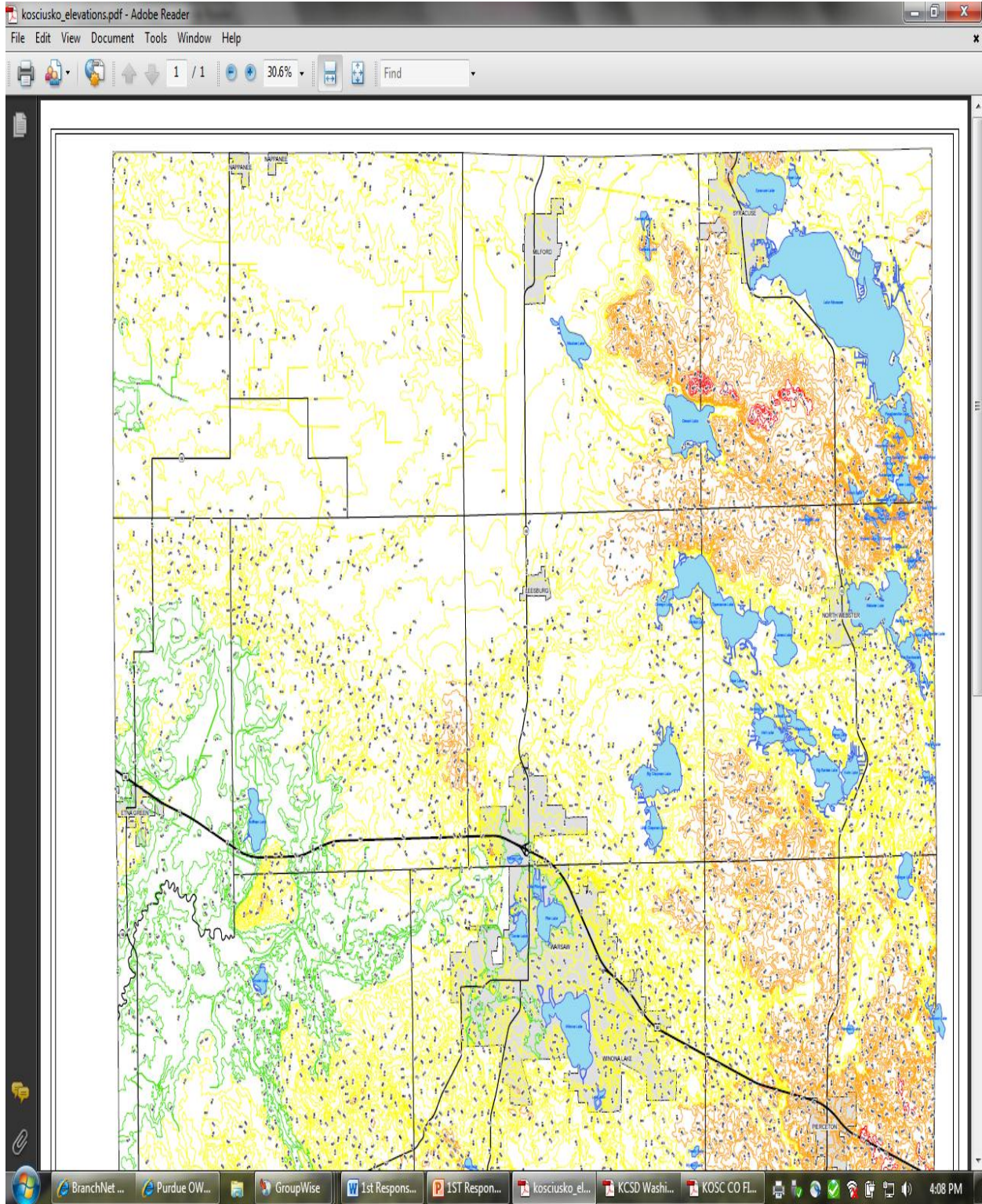
<http://transition.fcc.gov/pshs/public-safety-spectrum/narrowbanding.html> (n.d.) 9 April 2012.

# CURRENT COVERAGE





# TOPOGRAPHY OF KOSCIUSKO COUNTY






# QUOTE FOR SIMULCAST SYSTEM WITH ONE AGENCY

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1 / 2 74.9% Find



**J & K Communications, Inc.**

Phone: (260) 244-7975  
Fax: (260) 244-3253  
222 South Tower View Drive  
Columbia City, IN 46725-9799

Quote  
No.: 13962  
Date: 2/15/2012

Prepared for: Kosciusko County Fire Association  
P.O. Box 387  
Leesburg, IN 46538 U.S.A.

Prepared by: Adam Hurley  
Account No.: 103544

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**ANALOG/DIGITAL REPEATER EQUIPMENT FOR A FIVE SITE SIMULCAST/VOTER SYSTEM FOR FIRE**

(5) KENWOOD REPEATERS CAPABLE OF 12.5 KHz (NARROWBAND ANALOG) AND 6.25 KHz DIGITAL FOR FUTURE MANDATE, AMPLIFIERS, DUPLEXERS, POWER SUPPLIES, EQUIPMENT RACKS, JUMPER KITS FOR DUPLEXERS, HELIAX, COAX TIES, CONNECTORS, GROUNDING KITS, GROUNDING MATERIAL, LIGHTNING ARRESTERS, OMNI ANTENNAS, JUMPER KITS FOR THE ANTENNA SYSTEM, MOUNTING CLAMPS, COAX ENTRANCE PANELS, VAPOR WRAP KITS, VOICE MODULES, MODULE ADAPTERS, MODULES FOR HEAD END, MODULES FOR TX SITES, COMMON MODULES AND POWER MODULE, POWER MODULES FOR PS REDUNDANCY, OSCILLATORS, FILTER ASSEMBLY, GPS ANTENNAS, ANTENNA LINE SURGE SUPPRESSORS, NARROWBAND BOOSTER, AUDIO AMP, VOTER CHASSIS, SIGHT VOTER MODULES, PILOT TONE GENERATOR MODULES, CONVERTERS, BATTERY BACK UP MODULES, BATTERIES FOR THE BACK UP SYSTEM, LABOR TO INSTALL NEW REPEATERS, ANTENNA SYSTEMS, SIMULCAST AND VOTER EQUIPMENT, PROGRAMMING TO CREATE SIGNAL MAPS AND REPEATERS, INBOUND FREIGHT, REPROGRAM ALL FIRE RADIOS IN THE COUNTY, TRAVEL TO SITE AND TRAVEL TO EACH DEPARTMENT TO REPROGRAM, REPLACEMENT BASE RADIO ANTENNAS AND EQUIPMENT AT EACH LOCATION OF THE NEW REPEATERS

**4.9 MHz, 25 Mbps FULL DUPLEX LINKS**

MDS OUTDOOR UNITS, MDS COMPACT IDU, 4FT DISHES WITH DUAL POLARITY, 3FT DISHES WITH DUAL POLARITY, 2 FT DISHES WITH DUAL POLARITY, 1.2 FT FLAT PANEL ANTENNAS, POWER SUPPLY FOR IDU, CONNECTORS, PATCH CORDS, CABLE, JUMPERS, INSTALLATION HARDWARE, VAPOR WRAP KITS FOR ANTENNA INSTALLATION, CABLE TIES, HUB SYNCHRONIZATION DEVICES, SOFTWARE, HEATERS, SURGE PROTECTORS, BATTERY BACK-UPS, ETHERNET SWITCHES, BACKPANELS, ENCLOSURES, LICENSING FEE, LABOR TO INSTALL LINK ANTENNA SYSTEM AND AIM, INCLUDING ALL NEEDED SPARE EQUIPMENT

**Total: \$519,779.79**

Prices are firm until 3/16/2012 Terms: Net 30

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BranchNet ... Purdue OW... GroupWise 1st Respons... 1ST Respon... kosciusko\_el... KCSD Washi... KOSC CO FI... 4:08 PM

