

**Sherman
Public Safety
Communications**

Report on Phase 1

January 24, 2013

Public Safety Communications Project

- Recap:
 - Phase 1: retain RCC Consultants to
 - Analyze our current situation
 - Consider various possible approaches
 - Develop a high-level concept and cost estimate for the preferred approach
 - Phase 2: develop a detailed project plan and cost estimate, and specs for RFPs
 - Phase 3: implement the plan
- Each phase to be reviewed and approved by the town

RCC Consultants

- In existence since 1987
 - Focus on radio communications problems
 - Nationwide operation
 - HQ in New Jersey
- Rich Touroonian is our prime consultant
 - 30 years experience in this field
 - Led the New Fairfield activity last year

Our Current Situation

- Sherman uses Litchfield County Dispatch to handle its 911 calls for fire, ambulance and other emergencies
 - Private company, HQ in Torrington; handles dispatch function for most towns in northwest Connecticut
 - Worked with SVFD since 2006
 - Was the sponsor of the tower proposal in Sherman two years ago, along with cell-phone companies

How 911 calls are Dispatched

- At a high level the process is:
 - 911 calls are routed to LCD in Torrington
 - LCD sends out an “alert” signal to all SVFD members on their pagers, using the LCD “dispatch” radio channel
 - SVFD responds to the call, and notifies LCD on its “command” radio channel when we are on the scene
 - Then SVFD uses the local Sherman radio system – “Fireground” channel – to communicate among themselves while dealing with the situation

The LCD Radio System

- The LCD “dispatch” radio channel is very good
 - It reaches nearly every part of town to trigger the pagers
- The “command” radio channel is not as good
 - It does not reach some parts of town, especially the southern end
- LCD must take the lead on improvements
 - SVFD is working with LCD to identify and make improvements

Sherman's Radio System

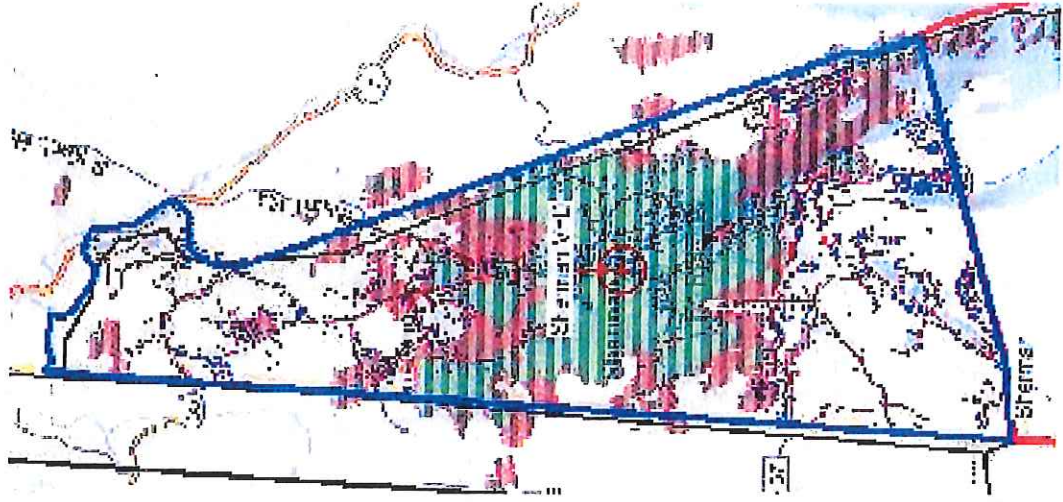
- Sherman uses three types of radios:
 - Pagers, which receive alerts from LCD
 - “Mobile” two-way radios in the vehicles, each about 40 watts power
 - Hand-held “portable” two-way radios for each member, each about 5 watts power
- The SVFD “base” radio at the Fire House is one of the mobile radios, connected to an antenna on the roof
- These radios communicate in-town, and with surrounding towns for mutual aid

Problems with Sherman's System

- RCC has identified two problems with the current operation of Sherman's radio system
 - “Coverage” is poor – the radio signals do not reach to all parts of town
 - There is no “back-up” for the LCD system if it is not available
- We'll look at each problem more closely

Problem 1: Radio Coverage – 1

Broadcast signals from the SVFD building do not reach the north or the south ends of town.



The green color shows where a signal can reach a radio inside a building.

The red color shows where a signal can reach a radio out on the street.

The white area does not receive a signal.

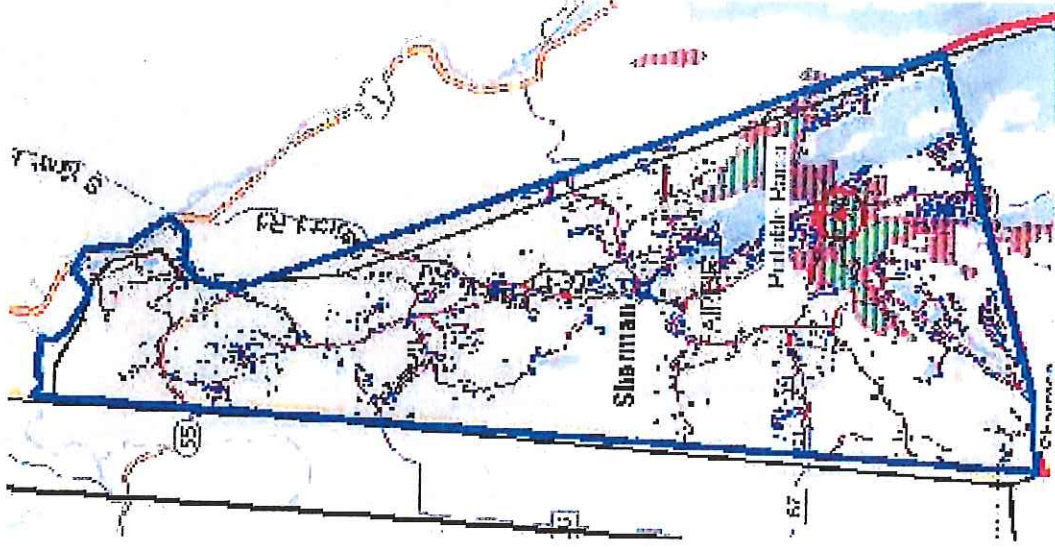
Each of the blue dots is an existing building in Sherman.

Radio Coverage – 2

The signals from the portable radios, depending on where they are in town, often do not reach very far at all.

Here is the “coverage” of a portable radio calling from Leach Hollow Road.

The signal does not reach even back to the Fire House base station.



This situation will vary depending on location.

But in many locations, especially north and south in town, radio communications among the SVFD members is very difficult, or impossible.

Problem 2: System Backup

- In the past 18 months there have been three cases when the LCD service has been reduced, or out altogether
 - Power failures
 - Extra heavy call loads in the whole region
- Also, several instances when Sherman faced extended, multi-day emergency situations
 - Thunderstorms – June, 2011
 - Hurricane Irene – August, 2011
 - Snow storm – October, 2011
 - Hurricane Sandy – October, 2012

System Backup – 2

- Sherman should have a local dispatch capability, tied into its local emergency management function
 - To page individual responders or groups of responders
 - To respond to multiple calls at the same time
 - To direct operations at multiple sites in town over a period of time
 - To manage different crews of responders separately
- Using the current system leads to confusion and “stepped on” communications
 - not to mention the coverage problem

One Other Item

- Rich noted that we have FCC licenses for certain functions that are not being used
- These are scarce resources, and there are those who go trolling for unused licenses, and could request the FCC to transfer them away from us
- We should take steps *right away*, regardless of the rest of this project, to acquire the minimum of equipment needed to establish use of these functions

What can we do about all this?

- RCC considered various possible solutions:
 - One tall tower
 - Ooops, no, they didn't consider that
 - Distributed Antenna System
 - Existing State Dept. of Public Safety Network
 - Future nation-wide network
 - Other technologies
 - Expand the existing system

Distributed Antenna System

- Locate antennas on existing telephone poles throughout the town, connected back to “base” by telephone lines
 - Originally developed for large buildings or campuses
 - Given Sherman's terrain, this would be very expensive, both to install and to maintain
 - Would need strings of antennas along most of the roads in town, especially into each valley
- This could be useful to plug small coverage gaps in other solutions

Existing State radio network

- This system is “as good as it gets” with current technology:
 - State of the art radio features and functions
 - “Hardened,” secure system
 - Interoperability with all State agencies
- Costs would be very high
 - \$500 - \$700K for each of two antenna sites to extend coverage to Sherman
 - Would have to replace all of our radios – ~ \$200K
- Would lose interoperability with surrounding towns (unless they join the State system)
- Would still have to maintain the LCD paging function

Future Nationwide Network

- Nationwide “4G” network for First Responders
- Tremendous potential for new data applications
- Many unanswered questions
 - Will Connecticut participate, and how
 - When will any solutions come into being
 - How good will coverage be in Sherman
 - How much will it cost
- This possible solution is years in the future

Other Technologies

- Various companies are exploring other technologies
 - Integrated 4G / satellite system
 - “tiny” antennas / “femtocells”
- None are available now, or expected to be available soon; costs are unknown
- After “availability” it would take years to complete a roll-out to all the individual municipalities to make a complete solution

RCC Recommends Expanding the Existing System

- In addition to the existing central transmission site, add a “northern site” and a “southern site” in town
- Locate the new sites on high ground, and install a “low profile, telephone-pole type antenna structure” at each site

Wait a minute . . . What does *that* look like??

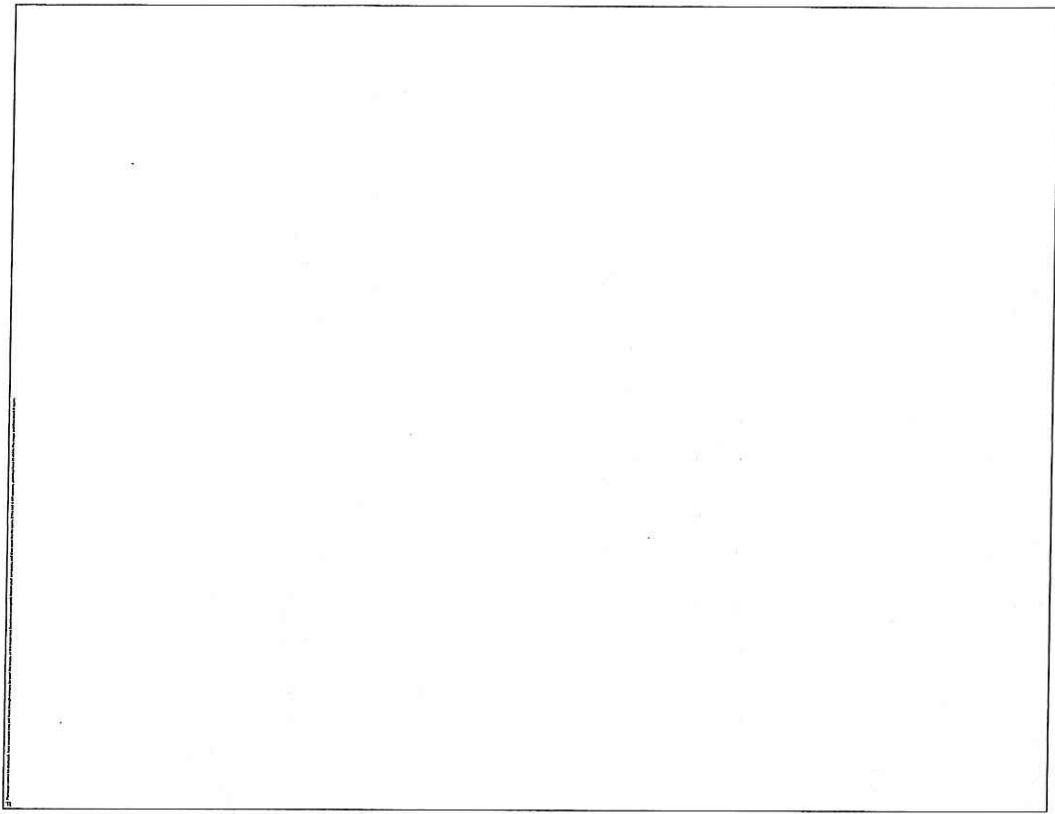
It Looks Like This . . .

This is at the Ball Pond Fire Department in New Fairfield.

It is a “telephone pole” that is 60 feet high. The antenna on top is about 20 feet high.

It is designed to extend just a little bit above the surrounding tree tops.

Depending on the exact location, and the surrounding tree heights, our poles would be 60 – 80 feet high, with antennas above that.



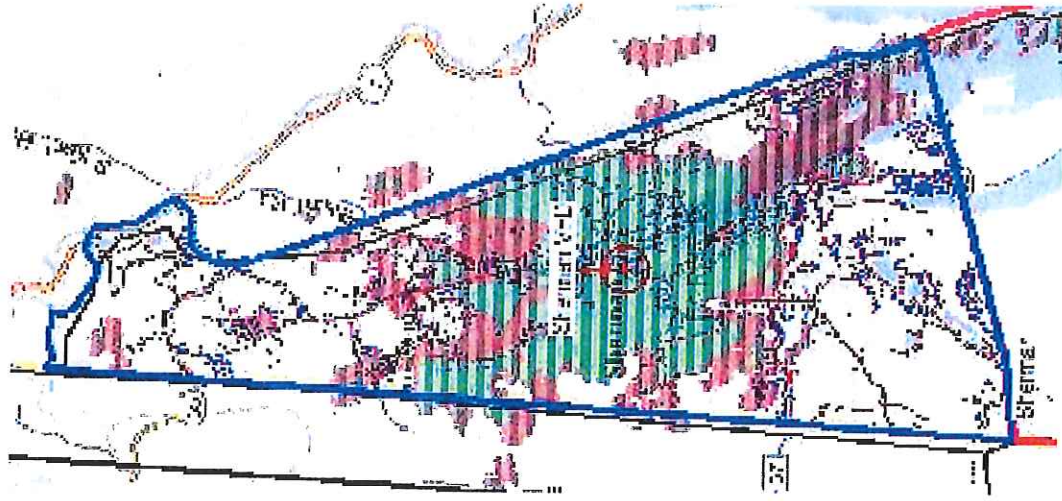
Proposal – continued

- Also, add equipment at each site, and connect the sites, so that every call is “repeated” through-out the town
- Establish a “backup” dispatch function in the SFVD building for when LCD service is limited or out.

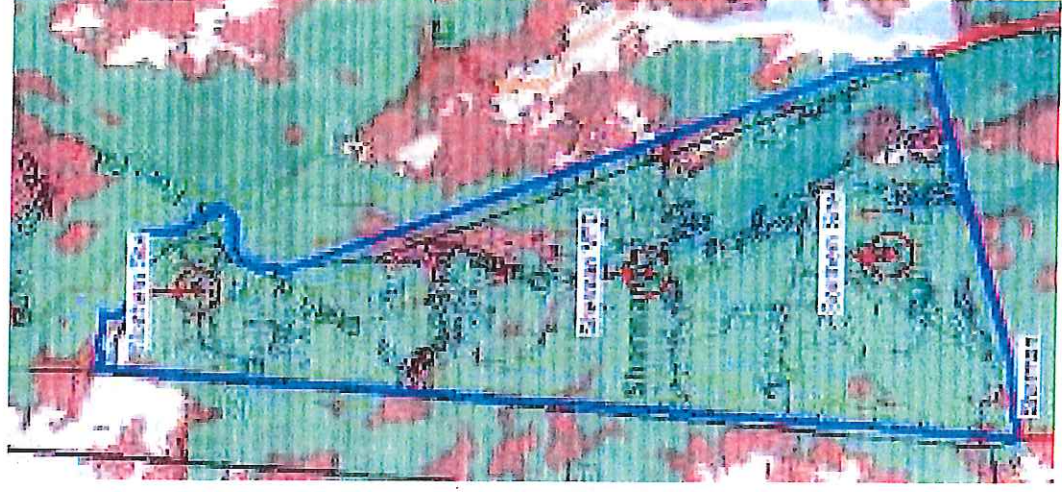
Result

- This would give Sherman at least 95% coverage through-out the town
- It would give Sherman much better ability to deal with LCD outages, to manage multiple calls, and to manage extended local emergency situations
- New Fairfield has done this, and New Milford is in the process of doing it.

Better than 95% coverage



Expanding the existing system in this fashion would provide at least 95% coverage from any SVFD radios in town to any other SVFD radios in town which are out "on the street" (the green and red colors combined), and to most areas of town for radios that are in a building (just the green colored areas).



By the way . . .

- RCC is of the opinion that:

“If the [existing] structure heights at White Silo Farm and Happy Acres Farm are amenable to cellular carriers providing service in Sherman, then it's quite likely that similar structure heights in the North and South of Sherman may also be attractive. This will especially be true in the South end of Sherman, where the population center is greater.”

- In other words, this might help with our cell-phone coverage problems

So, what . . . ?

- The committee took the liberty of concluding that this “expand the current system” approach would be the most desirable approach
- We asked RCC to develop a high-level cost estimate for this conceptual approach

Various Cost Elements – “Ball Park”

- The cost of acquiring land, or acquiring access to land, where the northern and southern sites could be established
 - *This is unknown at this point*
- The cost of establishing the two additional sites, and equipping all three sites to operate as proposed.
 - *This cost is estimated at about \$300,000*
- The cost of annual maintenance and operations
 - *This is estimated at about \$ 30,000*
 - 1-hour response time on equipment service calls 24/7
 - Telephone line costs with high-availability support 24/7
 - Electric power to the antenna facilities

A Number of Open Questions

- Finding specific locations for the northern and southern antenna sites
- Will the Siting Council be involved?
- Does the town wish to explore getting cell phone company participation?
- Local regulations review
- Can we get grants to cover some of the costs?

What's Next . . . ?

- Share the Report with the town
- Get feedback and opinions on proceeding
- Answer the open questions
- If the town wishes to proceed, Phase 2 would likely be along these lines:
 - Retain a consultant to develop a very specific, detailed project plan and cost estimate for acquiring equipment and constructing antenna sites, and specs for RFP's to do that.