ALLEGANY COUNTY
COMMUNICATIONS REPORT 2011

Prepared for

The County Communications Committee
and
The County Public Safety Committee

In cooperation with

The Comprehensive Plan Implementation Group

The Southern Tier West Development Foundation

The Allegany County Sheriff and Emergency 911Center

Office of Emergency Management and Fire

Department of Public Works

Office of Planning and Economic Development

And

The Allegany County Association of Town Highway Superintendents

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TABLE OF CONTENTS

ACKNOWLEDGMENT

This report could not have been commissioned without the vision and foresight of the Allegany County Legislature and the County Communications Committee. It is a collaborative effort among many departments, agencies and private corporations, all of which are stakeholders in advancing the capability of emergency response systems and in providing the public with broader access to communications. Many thanks go out to those who contributed funding and those who performed and consented to be interviewed in support of developing the Report. Special recognition is due the Allegany County Comprehensive Plan Implementation Group and The Southern Tier West Development Foundation for the funding of the project.

The County vision is that of developing an enhanced 911 emergency response system for police, fire, ambulance and Haz-Mat responders, while at the same time, where possible, sharing equipment and infrastructure to improve broadband access to communications for the Department of Public Works, Town Highway departments, business and the public at large.

Allegany County is fortunate to have been able to retain communications consultant Scott Teller to provide the technical expertise necessary to achieve the objectives of the Report, and we are grateful to Public Safety Committee Chairman Mike Healy for participation in the research, the County Planner Kier Dirlam for assistance with Geographic Information mapping and graphics, John Foels, Director of Development, and his staff who provided strong support and sponsorship in the creation of this Report and County Legislator Frederick Sinclair who has also contributed to the recording of interviews, transcribing and compiling the Report. Special thanks to Mike Johnsen for technical review and Richard Zink of Southern Tier West Regional Planning and Development for his dedication to improving communications across the region.

INTRODUCTION

While upgrading a 30-year-old emergency 911-communication system, Allegany County officials recognized common ground, which could be gained by acting in concert with on going efforts to provide enhanced private access to broadband communications. The opportunity to merge these heretofore-separate projects first manifested in the need for replacement of a County 911 emergency services tower. There was also a need for a private company antenna location, which was to be funded through a NYS Office of Technology grant. The two needs ultimately were met utilizing the County existing tower site and the NYS funding. The County provided additional support funding for the generator and cabinet for equipment. In the end, there was great savings to the County and benefit to the private broadband project. This report is an outgrowth of that initial public / private partnership and it was during this process of merging Federal, State and local resources, that the natural advantages of developing these systems in parallel became evident.

In several meetings prior to the inception of this report all-major users of local communications systems were queried and it was consensus that an overview of how these efforts can move forward, together, would be beneficial. This included the County 911 emergency services center, the Sheriffs Department, the NYS Police, County Information Technology Department, Office of Emergency Management and Fire, Town Highway Superintendents Association, Department of Public Works, Southern Tier West Regional Planning, and Southern Tier Wireless. It also became evident that connectivity to fiber optic cable, where possible, greatly enhanced the capacity, redundancy and durability of all communications systems. As a result, conversations with ECC and ION, as well as a “look at” existing fiber in the county were to be included in the field of study.

The approach to gathering information and data was to engage agencies and users in audio taped interviews which would identify the needs as well as the directions and equipment, used now and being proposed for system development in the future. An inventory of existing infrastructure (towers, fiber, cable etc) is also to be identified and entered into the County Geographic Information System for mapping and to provide advanced planning capability. The Report is also intended to analyze strengths and weaknesses (recommendations) as well as provide educational background on the language, hardware and nature of communications now, and how we envision it should be in the near future.

PART 1. Setting the Stage

The Report began to take form at a plenary session in early April 2011and an ambitious 8 to 12 week time frame was established for completion of the work. All sessions were to be recorded and appropriate representatives present, as much as possible, during the data gathering. The initial session included the consultant, Scott Teller, The Director of Development, John Foels, the County Planner, Kier Dirlam and Chairman of the Planning and Economic Development Committee, Frederick Sinclair.

As discussion evolved, concerning the approach to the study, it became evident that numerous observations and recommendations were surfacing early in the process and the format for presentation and discussion of it would take some experimentation. There were obvious gaps in information and it was consensus that the first steps should be to:

- Review the Request For Proposal for the 911 system upgrade
- Become familiar with the existing equipment and infrastructure
- Get existing fiber information and the ION agreement with the Federal funding source.
- Review the ECC report and identify private networks.

The discussion identified the need for an additional tower to support the 911 upgrade and the ongoing and growing concern regarding the proliferation of towers, which have an obvious impact on the view shed. It was consensus that over time, the numbers of towers should be kept to a minimum through shared public and private usage. Policy should be investigated whereby Town Laws require building permits and as a condition of same, the County emergency services network is granted access to the proposed tower for enhanced 911, emergency services, public works and Town highway communications. It is also anticipated that the proper assessment of tower installations may inspire sharing of sites and at the very least provide appropriate tax revenues to the Towns and County. Tower installers should be invited to be more involved with the community. The County Planning Board will be asked to examine this issue and research Town control of tower sites.

There were some obstacles identified regarding the inventorying of existing capability for the transfer of data in large and small private system operations. FCC information will be utilized as background/base for development of the GIS; however, the “guys on the ground and poles” will be able to provide more accurate information as to where lines actually are and what the real provider capability is. All phone DSL access needs to be included in any overlay of the communications grid. The systems in operation at our borders and into Pennsylvania are also important for understanding connectivity, emergency interoperability and the development of broadband access for the public. These connections will have a profound impact on decision making about infrastructure. It is known that through changes in technology, Time Warner has access to more extensive technology than previously

thought and that there is a major trunk connection to a global fiber optic network at a Verizon substation in Rushford. Putting these little understood pieces of the puzzle together with our future needs and those of our surrounding Municipal neighbors, will provide a clearer path to development of the enhanced 911 and private communications for the near future.

The following important points were also identified during the session wrap up:

- Emphasize the need to know the types of tower and what equipment is on existing towers.
- Check on ability to connect Pingrey Hill tower to the ION fiber.
- Hooking to fiber means no dead ends with both ends feeding data.
- A “Mux” takes light spectrum and turns it back into signal.
- Potential connectivity and pathways between towers needs analysis.
- The courthouse tower needs checking for strength and load.
- The backup 911 center should remain at the County Office Building.
- Every emergency and public works vehicle in the County could be tagged for monitoring and deployment from the enhanced 911center.

PART 2. The 911 Emergency System Upgrade.

The Report interview team, Teller and Sinclair and Healy, met with the administrators of the 911 system at the County Jail and Emergency Services complex. The Sheriff, Rick Whitney, as well as Lieutenant in charge of the system, Dan Hanchett, and Mike Healy Chairman of the Legislative Public Safety Committee and Communications Committee member, were present. It was stated and all agreed that all parties involved in county communications system development and management need to avoid tunnel vision and be receptive to many perspectives on system development."We need to make good decisions based on identified needs by adding to the conversation and insuring that what is discussed is understood and described accurately."

The County RFP for implementation of the 911-system upgrade was evaluated and found to be a very sophisticated, extensive and ambitious jump in format and equipment, which would orient our systems toward P-25 digital compliance, while maintaining functionality of the existing analogue equipment currently in use countywide. Examples of other system designs as well as private vendor, manufacturer and Homeland Security guidelines were utilized in formulation of the RFP. The accepted response was from Saia Communications. The system constructed (See Appendix A) would be a system suited to taking us far into the future in terms of functionality, interoperability, broadband simulcast high speed data transfer, and adaptability to the future of 911. Additionally bringing in DPW, Town Highway, and emergency management and ultimately, furthering the goal of P-25 compliance.

What is P-25 compliance?

P-25 compliance is the standard set by the federal government to steer future development of public emergency communications systems toward the ability to operate together, transmit large amounts of data at great speed and achieve interoperability (communicate) among all departments and agencies during disaster response and events such as 9-11.

The current 30-year-old system has historical weaknesses and the current low band 4636 MHZ function leaves several areas of the county inaccessible. Going to high band will remedy the weaknesses and provide 95% to 100% mobile coverage. More financial support will be required to assist local municipalities with the transition of the equipment and attendant costs for enhancement of the tower presence to saturate the service area. It is important to point out at this time that that service areas (fire protection and ambulance) include townships in neighboring New York counties and Pennsylvania.

There are significant issues that are associated with the protection and maintenance of the infrastructure and equipment supporting emergency communications systems. Fencing of tower locations and telemetry safeguards (camera monitoring) and routine inspection are essential. Routine mowing is performed by DPW with visual "inspection" of site conditions in general, however, enhanced inspection of the

cabinets, generators, towers, fencing, etc. needs to be established with a checklist and responsible entity identified and given the resources to accomplish these tasks. The insurance of the facilities needs to be reviewed to insure coverage in the event of damage to the facilities.

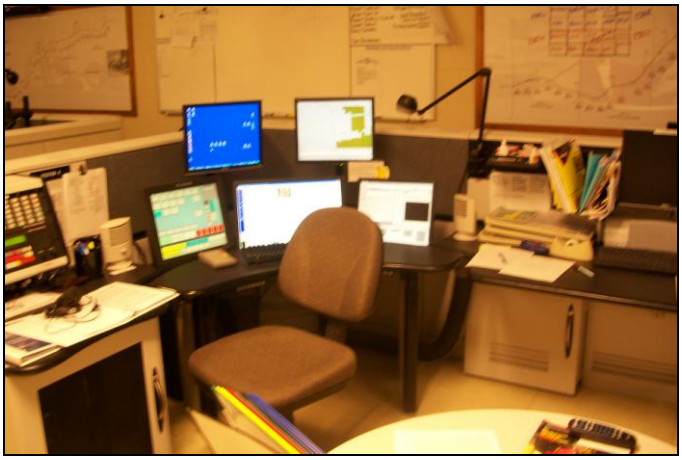
In discussion of broader application and usage of the infrastructure and radio capability of the system, it was agreed that communications other than 911 could run on these radios on the towers and in the system, however, the safety of the public is paramount and the integrity of the 911 signals and functionality can never be compromised. Interconnectivity with ION fiber optic cable will be beneficial to 911 and the County should do everything possible to capitalize on the opportunity to connect with and achieve redundancy via the fiber optic cable.

The question of how prepared the County was to adapt and mitigate failures in the emergency communication system was discussed and it was pointed out that the County currently has T-1 lines and some fiber connections in place with automatic switch over. More access to improved, less costly and expanded fiber networks would further enhance this redundancy. It was noted that ION might have some obligation to provide strands to host communities however, no contracts or commitments in writing to this effect have been forthcoming. There is however the opportunity to suggest where points of connection should be placed (loops in the cable) in order to facilitate connections to the fiber optic cable. The County should identify and take advantage of every opportunity to make the connections between the wireless and fiber systems.

Due to the terrain of Allegany and the surrounding counties, in order to grow into the full capacity of digital P-25 compliance, more presence of antennas on towers will be required. The high band digital signal does not bounce around or cover hilly terrain as well as the low band older systems. The advantages of digital, however, far outweigh analogue. With this in mind, the Report will perform an inventory of existing towers, their owners, level of usage, latitude/longitude ease of access etc. This inventory will be placed into the County Planner Geographic Information System (GIS) for usage in planning and negotiating expanded tower coverage. As work on the Report continued it became evident that combinations of microwave hops can provide wireless access to fiber optic cable where direct connection is not feasible. Because of this, the possibilities for redundancy and enhancement are apparently readily obtained and will be discussed in more depth later in the Report.

The 911-system upgrade is designed to be a simulcast broadcast from one central tower (Corbin Hill) to five support towers. The location and construction of a new County tower on Pingrey Hill in Andover, has eliminated the need to upgrade the Joyce hill and old Alfred tower. Simulcast means that all communications will be sent to all towers across the county, providing signal to pagers and or texting, regardless of the location of the responder. The Alfred PD and SUNY Alfred security expressed concern about maintaining the quality of service that they now have prior to upgrade. They have been assured that the Alfred tower connection will remain in place as

backup and that the new Pingrey installation is designed and capable of providing equal and better performance. The new simulcast system will enhance interoperability communications between Alfred PD, SUNY Alfred Security and the Allegany County 911 center.



911-control room

A tour of the 911-control room and equipment room revealed several 911 stations with multiple large format screen stations and phone style communications/headsets. The room had the feel of an internal secure bunker. The adjacent, equipment room was behind a glass door and is air conditioned to 70-74 degrees on a special air conditioning system. The room seemed packed but there is ample room to accommodate the new equipment on the racks and there is another equipment room at the complex that can easily accommodate further expansion. The system has 3 hours of battery backup and two auxiliary generators that kick in automatically without the transition seen or even felt. The systems are tested weekly.

Mechanicals Of Typical Tower

Data transfer to the County office building is encapsulated and encrypted. From there the signal goes to Corbin Hill (central hub) for simulcast. No System changes are made without checking with the technical advisor, from the County IT Department, so that there are no incompatibilities. It is noted that a computer based program, to road map the entire IT based system, for monitoring and address checking, is greatly needed. Such a system would allow tracking by the IT Department, vendors and system administrators.

PART 3. Emergency Services and Fire

Discussions with the Director of Emergency Services and Fire, Jeff Luckey, revealed that his feeling was that the proposed communications upgrade would be a big advantage to all emergency responders, especially in the simulcast mode which would reach all responders regardless of location, resulting in improved response time and better connectivity for fire departments. The automatic selection of the best tower, replacing the current manual switch over is also of great benefit.

Fire companies will be required to get new compliant equipment, but this can be accomplished gradually because the existing analogue equipment will still be accommodated by the equipment being installed. The ultimate build-out of the digital network will further address the blank spots of coverage. Director Luckey reflected on the fact that "it has been 50 years and the communications problems (dead spots) are very similar. It used to be the siren wasn't heard or didn't go off, now, the individual pager doesn't go off." Pagers will most likely be replaced by cell phones, which will reduce costs tremendously "and they don't make digital pagers anyhow."

It is important to note that after you hear there is a house fire, from dispatch, the rest of the response is dependent on communications between the trucks and the coordinators on the way and during the response. Access to grants for upgrade of the local equipment will help the companies' transition. Everybody needs to be able to talk to dispatch and to each other.

The status of neighboring counties needs to be considered in terms of maintaining and upgrading communications. Livingston County for example, services some northern border fire districts, they are low band, and some neighboring Cattaraugus County companies are Low Band, as we, are moving to high band simulcast analogue and ultimately digital. It is recommended that there be regional meetings and planning to mitigate this potential disconnect. Everyone needs to take the pill of P-25 high band compliance, and although it is an expensive prescription, once we are all home base digital, translation back to analogue and various bands is more attainable. Another consideration is that 75% of Fillmore ambulance calls go to a Wyoming County Hospital. What are their communications plans? Interestingly, Potter County PA is high band and will ultimately be a better fit than our other NYS neighbors will. There is an interoperability Committee between Allegany, Steuben and Schuyler Counties, but there needs to be solid inter-county communications capability between all immediate neighbors and a plan needs to be developed. Shared bases of operations could be efficient.

Allegany County has applied for a more than 2 million dollar grant to meet the needs for transition of local department equipment. This would utilize 911 surcharge dollars and cover the costs of over 100 mobiles, 20 base radios and 1300 pagers or cell devices.

Part 4. County Public Works

The Report development team of Teller, Sinclair and Healy met with the County DPW Deputy Superintendent in charge of Highways Guy James, Solid Waste Deputy Dean Scholes, and Supervisor Dennis George. The discussion began with a question regarding the sanctity of frequencies and how they were to be assigned in the new system. It was evident that there was a lack of communications when planning the system and the DPW was understandably reluctant to sharing a channel with all 29 towns and 10 village highway departments. The issue is one of controlling chatter and isolating channels was apparently easier and more efficient than attempting to control chatter during hunting season. As it stood, there were four channels planned: two fire, 1 law enforcement, and one County DPW. Further discussion of the new digital capability and issues of channel management revealed that with intensive management, there may have been room for sharing a channel for public works, but as it stands, Towns and Villages will be provided a 5th channel. As a result, another channel is being built into the enhanced system and in order to control the costs, second tier equipment will be utilized. Much of this disconnect occurred because the 911 emergency agenda overshadowed the new system design and Public Works along with Town Highway Superintendents were not consulted early on in the project design phases. No one realized that upon full implementation of P-25 compliance that channels will be easily split and the isolation and channel management will be a programmable function of the actual radios (base and hand held). As it stands, however, until the full digital upgrade, we will have isolated channels and specialized channel management protocols and sharing can be slowly implemented.

The County DPW Highway communications network is presently analogue and suffers similar holes in coverage to the emergency services system. There is agreement that high band digital and P-25 compliance is the proper direction and target. There has to be very good communications between all parties sharing the equipment and infrastructure in order to efficiently collaborate on construction, operation and maintenance. We not only need enhanced broadcasting capability, we need a better communications system between departments and users.
As the discussion progressed, the following points were made:

- Who is going to assume overall maintenance responsibility for the tower sites? With the exception of mowing, DPW is not currently inspecting.
- DPW could do this, as long as there is a budget/plan/process identified.
- A log needs to be kept of generator maintenance and a budget established for upkeep, inspection and maintenance of this equipment.
- Connectivity with school bus radio systems should also be examined and they should not be left out. Alfred State bussing of students between Alfred and Wellsville is an example.
- What is the insurance coverage being purchased for the towers, equipment and liability? The worst danger is children on towers and every protection and caution needs to be in place, inspected and maintained.

- Lowering ice loading on towers in our control is extremely important to the safety and longevity of tower infrastructure. Anything that can be removed or upgraded with a lighter and smaller footprint should be.
- The tower assembly on the County office building is a solid rod tower and pretty stable in light of the considerable real estate present. (number of antennas) It is not sure of all in use and a reconfiguring per above comment is warranted.

Part 5. Discussion with the President of the Town Highway Superintendents Association.

This interview took place with Sinclair and Teller joining Kevin (Fred) Demick who is the President of the Allegany County Town Highway Superintendents Association and Superintendent of Highways for the Town and Village of Angelica. There is a special frequency (frequency # 5), which is to be configured alongside the four emergency frequencies, in order to service the 29 townships and 10 Villages and other possible outside users such as School Districts (busses) etc. The Towns joined with Southern Tier West, and through Appalachian Regional Commission funding, was able to begin outfitting Town highways with computer access to laptops as management tools for Highway Superintendents as well as some base stations and portable truck radios that could operate in analogue and digital when the time comes. This provides connectivity with the 911 system and furthers interoperability with even broader implementation of P-25 compliance. The Town officials realize how crazy it can get with chatter, however, the lines of communications need to be established and kept open no matter how big this inherent management hurdle.
“Everybody needs to move ahead together” It is planned that there will be one digital capable base mobile for every Town Highway Department to start. The bases should be able to transmit analogue narrow or high band to the older equipment, in the trucks, until all of the field equipment is upgraded. This will most likely happen during attrition of the portable radios. The computers provided and result of moving all departments toward high band digital access, will greatly enhance the connectivity, which can occur through the internet and fiber under wireless networks. This is actually the best, hopeful network for providing needed redundancy to the wireless emergency 911 system to insure the fit is perfect, and that “everybody will eventually be on the same page”.

When asked, "What are the obstacles that exist"? it was revealed:

- We need our own frequency
- Presently, during a fire, ice storm or road emergency the connection to the Highway Superintendent is not assured.
- It would be good to be able to have trucks called into service, and monitored from a central location.
- A special dispatcher should be available for County, Towns and Villages to call into service in emergencies. This would relieve 911, enhance the response, and function for these other responders. As it is now, communications can be severed during major events due to inability to filter and control chatter.
- The entire area of relationships, monitoring and dispatch needs to be resolved.
- School busses should be included. Some have radios, some high band but different Districts have different radios, even the high band units can vary greatly.
- Communications to shelters needs to be examined and brought into uniformity and the spirit of P-25 compliance.

- The newer radios are 1,000 channel radios so in theory you could hear everything for enhanced “heads up”.
- The ideal is to have Town bases and a couple of mobiles or portables that can reach out just as far, but battery life becomes the limiting factor for hand held units.
- Important responses are handled by Highway Superintendents but we need more of those officials to step up and get involved. We need proactive Highway Superintendents.
- It will be very helpful to be more informed on “what’s going on” which means more reliable and utilized communications equipment and connections.
- The Tri-County shared services committee, (coordinated thru Southern Tier West Regional Planning and Development Council), is working effectively to improve regional communications and this effort needs to be strongly supported.
- The idea of communications and enhanced infrastructure is great, however on another level just “keeping people communicating” is the real target.
- Many highway guys are going with Verizon Internet, which is a good deal for multiple computer hookups.
- Birdsall, Town of Allen, Whitesville, are the worst areas lacking communications coverage. The Tower in Swain has not solved the Birdsall problem. The holes and areas of need have effectively been identified by Southern Tier West Regional Planning and Development Council and the remaining $80,000 in STW funding will be spent on local access via radios and computers.

There is excitement among the Town Highway Departments with the computer connections and informational system set up by the Town Highway Superintendents Association President, Fred Demick, in concert with Southern Tier West. These initial steps are getting extensive usage and the upcoming improved radios, access to information and enhanced 911 will not only be an extension of our ability, but also break some barriers and increase our willingness to communicate.

Part 6. Discussions with Mike Saia, Enhanced 911 System Equipment Vendor

Saia Communications is the vendor of electronic systems and equipment who was awarded the job of configuring and installing the enhanced 911 communications system. The system being constructed is a simulcast analogue design and the Motorola repeaters being utilized are being operated in analog mode. It is designed as an analog system because many departments in the southern half of the County have already gone to VHF radios and will be capable of utilizing the new system with only a reprogramming of their present VHF radios. The new VHF system will also be interconnected into the legacy low band system so that departments that do not have VHF radio equipment will be able to communicate as they do now and to the new VHF radios. Those present during the interview were Mike Saia, Assistant County Administrator Mitch Alger, Legislative Chair of Public Safety Mike Healy, and the Report team of Teller and Sinclair. The conversation began, by highlighting the importance of development of an overview of everything that is happening in communications. This involves not only the enhanced 911 system but also the public access to wireless, the installation of fiber optic cable, the connections to the internet and how enhanced communications benefit all aspects of the region. The overview will facilitate shared tower installations and lead to efficiency in sharing of infrastructure as well as introduce the issues of arranging for ongoing maintenance and the need to develop technical expertise. The first and foremost point reiterated was that we have designed a very sophisticated 911-system high band upgrade. (See Appendix A). The system capability is designed to last well into the future, however, the County will have to enhance infrastructure (towers) in order to build full digital into the system capability. The first example of this is the County replacement of two existing tower locations with one new location at Pingrey Hill in Andover. New generators and equipment cabinets were also purchased to improve the housing protection and air conditioning of the new radios being placed at the six locations.

Typical Signs on Tower Sites

What is being installed is high band simulcast analog with many digital and P-25 capable components; however, it will initially be broadcast in analog simulcast mode to accommodate the existing end user equipment. The biggest concern is fire

department VHF radios with wide to narrow band serviceability and analog radios. It is important to note that FCC is mandating that all emergency communications must go to a 12.5 narrow bandwidth in high band and everyone must go there. Simulcast allows for multiple transmitters broadcasting at the same time over the broad coverage area. This involves a hub and spoke configuration with the hub at Corbin Hill in Amity and simulcast to five strategically located towers around the County. This configuration will provide much enhanced coverage. (Appendix C)

There will be five analog simulcast channels assigned and labeled as follows:

- 1-Sheriff
- 2-Fire A
- 3-Fire B
- 4-County DPW
- 5-Town DPW

The 5th channel is being licensed for all other Town and Village Highway departments and possibly school bus, as an add on, and not part of the RFP for 911, As this was not part of the PSIC grant, second tier equipment will be utilized to minimize expense, however the performance is expected to be excellent and quite serviceable during the period of transition and upgrade for this group of users.

All of the microwave connections will have IP addresses with 300 Meg capabilities at each point on the wheel. Saia Communications comes out of Buffalo with Point of Presence (POP) bandwidth to their towers and they function as a Tier 1 provider. There is adequate bandwidth and internet connectivity at all tower sites. These discussions led to one very important connection, which revealed an all-important factor in the enhanced communications network. That factor involved redundancy in the face of interruption or failure within the wireless system. All of the channel banks, microwave hops, switches, prime site and backup site will have IP addressing and, upon connection to fiber optics, multiple avenues for transmission can utilize the internet and arrive at fire halls, police stations, emergency shelters, highway departments, school bus garages etc. Currently bases at fire halls do not have internet addressing and this is a conversion that will have to be made. Project Consultant Scott Teller pointed out that this is not only the solution to redundancy needed in the emergency response system, but that over these same connections, we could provide enhanced inexpensive access to the internet for remote Town halls, highway garages, ambulance bays and shelters! The opportunities here are endless and emergency messages can travel hundreds of miles of automatically available alternative fiber connections in nanoseconds.

It has also been observed and pointed out, by project consultant Scott Teller, that the tower system can be easily connected to the fiber network by the use of relatively simple microwave hops (beams) between the two systems. This conquers what was thought to be a hurdle of connectivity of fiber optics and Tower sites. We no longer need to think that the two systems cannot be connected without proximity and great expense. This is a game changer across the board!

Further discussion with Saia Communications revealed the following points:

- Do not mix Public Safety with Public (Private access) to bandwidth. Separate systems sharing towers and infrastructure are fine.
- Larger radios (300 MHz) and larger antennas are utilized to mitigate fade factor. This is a loss of clarity in signal over large distance and varied terrain.
- Dish signals may start out ¼ inch wide and with a 3-degree beam end up quite wide over miles, however, these weak signals are amplified by the larger antennas.
- Everyone including manufacturers is leaving low band equipment and there is a lot of interference possible for these users. Cost notwithstanding, high band and digital is the right move.
- Low band is presently loaded with noise from other interferences and the noise floor has been and continues to be raised considerably.
- Wyoming County has recently gone through a similar change and a Hop from our Granger tower could connect to the Wyoming County network for further backup.
- Cattaraugus and Livingston are still low-band. There is a need to engage in discussion with our neighbors.
- A portable backup van is viable and if equipped with telescoping mast and microwave antennae, would provide valuable mobile connectivity. Erie County has such a Command Vehicle.
- The old 911 center at the office building in Belmont has a backup console, which can function with the new radios/infrastructure being installed. There is an older Z-station at the office building and a newer Z-station at the new jail and safety complex.
- All dispatchers should be assigned to the older dispatch center at the County office building for at least 4 hours per month for testing and acclamation to the backup center. If something happens at the Jail, the dispatchers all have to be able to take over at the backup center on older equipment.
- The 480 foot old WNED tower (leased by Saia) in Angelica could function as a backup and the other WNED TV/Radio tower on Corbin Hill might be available and would be ideal. The County should pursue this opportunity!
- The lease arrangements at Birdsall and Alfred should be looked into.
- Many of the shelters like that at Granger is rodent infested, not weatherproof or air-conditioned, which are the points that support the expense of the smaller new cabinets on site.
- There will be system monitoring at the antennae stations as well as HVAC systems to monitor. This brings about the question of adequacy of maintenance plans and insurance coverage.
- 15 kW generators are needed as upgrades to handle the loads of air conditioners; the existing 5 kW units are not enough.
- Routine maintenance will be provided by Saia while under the 3-year warranty however a maintenance contract will be required after that.

- The connectivity of the school bus communications systems is not presently under consideration; however, there is a wide area network available through Saia Communications, which is a commercial service. The bus system actually should be, and are “somewhat” connected via the Town Highway systems and their connections to the central 911 system.

Part 7. Interview with Chief Walsh at the Wellsville PD.

The Report interview team of Teller and Sinclair joined Public Safety Chairman, Mike Healy and Police Chief Walsh at the Village of Wellsville Police Department. It was noted that this large police facility was, just a few years back, the 911-dispatch center for the entire County and is well equipped with a large antenna at the site and direct connection to a high broadcast tower on Alma Hill. That tower is owned by former chief Cicerello and gives very good coverage of the Wellsville jurisdiction and well beyond into surrounding towns in the southern part of the County. All of the 911 specific equipment went to the County upon switchover of the responsibility for 911, however Wellsville maintains up to date high band analogue equipment. They currently operate the station with dispatchers Monday through Friday and still handle some emergency calls with a lot of activity run through there during emergencies. There is a direct interface maintained with the main 911 County control center in Belmont. It is noted that when their system, manned with their people, were responding to local 911 calls, there seemed to be quicker response. Without being critical of the existing system, there can be delay in services as it is now and there have been complaints about response time. The small town handling of the small familiar area and locations was more efficient from their operational perspective.

There is great cooperation with the outside agencies and lots of interaction with the NYS Police on weekends. There is always room for improvement in speed of response when dealing with 911. As it stands now, Wellsville does not receive 911 calls directly. There is question if the singular center will be able to handle a major event such as Hurricane Agnes in 1972. Leaving Wellsville 911 capable might have been a good move. It would be good to consider Wellsville as a possible relay and or redundancy asset in the future build out of the enhanced 911 system.

There are not many occasions when there is disturbance to the system and their repeaters. Communications are great in the Village and surrounding areas. The Wellsville ambulance also utilizes the Cicerello tower and this location has great performance as well as capability to receive digital/analogue signals. Some further comments and topics of discussion were:

- It is observed that civilian dispatchers have changed (slowed) the level of excitement and speed of response in comparison to when they were police dispatchers.
- It does not seem as though there is the improvement of response performance as you would expect over time.
- There used to be one police channel and chatter was a problem but a new frequency solved it and channel management is key to managing interference and maximizing performance of the systems.
- There is no reason that we cannot all be tied together and work together rather than shifting all responsibility to one location.

- There have been problems with fire dispatch pager signals inside of some of our industry buildings. Electronics, welders, etc. create interference and the switch to phone texting may help with this.
- The Village utilizes BRICO Communications for technical service.

Part 8. Discussion with the County Information Technology Department

Report consultant Scott Teller, along with Legislators Fred Sinclair and Mike Healy met with IT Technicians Keith Hooker and Chad Coombs. The 911 emergency system administrative structures recently underwent a change to being fully run by the Sheriffs department. During this shift, and with implementation of the enhanced equipment and infrastructure, technical responsibilities also changed and the County IT Department was assigned to assume more of a role in overall maintenance of the 911 system. The IT technicians felt that just the extension of the network posed no problems; however, the adding of new components and types of equipment was where the biggest challenge would lie. An example being the addition of 6 new cameras and security devices with their constant signal will require special treatment and monitoring. The IT technicians had not been provided with a copy of the RFP system design nor an overall system overview. It was suggested that they get a copy from the County attorney as it provides the whole picture.

The discussion moved into why we needed to develop this "tree top" perspective of not only the 911 upgrade but how the management of it fits with myriad County communications systems they are already handling and what do we (the County) need to do to prepare for this expanded responsibility from the IT perspective. Presently, Saia Communications runs the networks on radios and towers with IT handling the wiring and functions of buildings and the 911 system. There are some relics of oddball equipment which have been identified and removed. The entire IT team (Department head and three technicians) is briefed on activities and "it is nice to have in house people knowing what is going on in the system." The way it is unfolding is that 911 calls IT that services and troubleshoots then if need be, IT will call Saia Technicians. There is no formal County contract with Saia but one is needed. Much of the service is handled via warranty but a more formal structure should be established. As IT takes on more of this maintenance, response and troubleshooting, manpower will be taxed. There may be the need for more manpower as the activity increases.

Lieutenant Hanchett, (Sheriffs 911 Coordinator) has been very good at keeping IT informed and moving toward being their technical provider, with help from Saia/vendors secondary. When asked what about towers, the IT technicians said they are not familiar with the towers or who was doing or going to do this. There is indeed equipment up at these towers which IT may be required to service. When asked how often these units should be serviced, the humorous yet serious response was that "electronics are funny, if you touch something that is working fine, you are likely to break it".

Further issues and responses were:

- It does not have the manpower to do routine maintenance on generators, tower and cabinet inspection etc. This should be performed and could be DPW or contractual. Contractual is most likely due to continued DPW budget cuts.

- Signals go from here (IT Office) via fiber to the old jail cabinet and then to the roof antennae on the County Office Building. We have microwave hookup to the jail and emergency services complex, also the OFA and Veterans Affairs buildings at the Crossroads complex. The backup 911 system, at the office building, also has microwave link to the main broadcasting hub at Ackerman Hill.
- When the 911 upgrade becomes fully functional it will be taxing. There is a lack of surety as to the role of IT and the amount of time it may take to service the systems. Upgrades which need to be done should never be put off due to lack of manpower.
- The 4 digit dialing via phone, to the Sheriff, goes up the antenna on the office building to the jail with a backup path to Ackerman Hill (Hub) then back to the jail.
- There are T1 lines on the main microwave beam which are for radios and tones. Rain can interfere with the backup signals or a lightning strike which is rare but has happened.
- The 911 center has 2 phone systems that are on their own outside access and can be reached on a 268 dialing.
- Money, notwithstanding, connection to the new ION network would be very good.
- There was a very expensive 10 Meg commercial connection to the jail and shifting to our microwave link saved $1,000 per month.
- There is a T1 side-path with the County using the main Microwave pipe and 911 using the T-1 lines
- IT has access to all system addresses, passwords etc. The entire system can be managed from the main IT office in the downstairs of the new Courthouse addition.
- There was an instance of suspicious outside activity 4 years ago, but most of the threatening activity comes from inside users. IT interrupts immediately when needed.
- The emergency backup 911 center at the County Office Building should be utilized; however, the panels need to be upgraded.
- The backup center has ineffective computers which are antiquated and completely different. A new dispatcher at main dispatch would be hamstrung at the backup. The backup center hardware is at the 5 year point to indicate end of useful life.
- IT doesn't monitor Electromagnetic Fields (EMF) and have not experienced complaints or known health issues. The microwave beam to other facilities is allegedly checked by installers for safety.
- The lines of communication with the Sheriff are excellent at this point in time and although the Sheriff has suggested a permanent IT technician on site, The IT crew is a team which has to be a collective unit and assigning a person just there is not efficient.
- IT Technicians are on call but there isn't formal scheduling.

- County policies for computer safety are being broken and no enforcement is forthcoming. An administrative password was stolen and nothing happened that IT knows of. Policies need to be enforced!
- The equipment in the bubble needs upgrading
- The IT Department is good at the first line of defense and repair but formal arrangements for technical backup from venders and consultants is essential to handling the entire gamut of things which may occur.
- IT currently services 25 servers, 450 computers and connections, software issues, all phones, cell-phones and the 911 system, if someone calls we try to help them out. We get calls about any number of things and are here to serve the County. As for manpower we are currently "pretty good" but with the new expansions in systems we aren't sure about handling the ultimate workload.
- We don't keep detailed logs of activity and time spent at each system which would be difficult and time consuming. If there were to be reimbursement from 911 then there may have to be recordkeeping, of time spent, in support of the 911 system.

Part 9. Discussions with a local Assessor and Building Code Officer.

Report investigators Teller and Sinclair visited with Assessor Russ Heslin and Code Enforcement officer Clair Beeman in Rushford NY. Mr. Heslin was an important source of information regarding the treatment of tower assessment due to the fact that his group handled the assessment for 8 towns and building permits and code enforcement for 9 towns and 1 village in the northern portion of Allegany County. Mr. Heslin revealed to us a rather uniform system for the assessment of towers which is based on published guidance provided by the International Association of Assessing Officers (IAAO) Valuation of Wireless Communication Towers and Sites. It is solely the assessor's responsibility, however, to assess/place a value on communications towers and not NYS or IAAO. There are actually three valuation approaches generally accepted (Cost Approach, Market Approach and Income Approach). Mr. Heslin utilizes the Cost Approach. The towers are capital improvements which are easily plugged into 20 year depreciation schedules and values are established by NYS to accomplishing this. For the most part, towers are the subject of rental agreements and the real estate on the tower (antenna arrays) are taxed based on their type and configuration. (Array)

Poorly Maintained Site

Well Maintained Site

The IAAO, Valuation of Wireless Communication Towers and Sites, provides guidance for the assessment of towers and the arrays. Some suggest assessed values up to $1,800 per month per array. In many cases these top end numbers might apply in high user urban areas, however in rural sparse user areas, they resulted in unrealistic assessments and Mr. Heslin chose to charge $ 1,800 per antenna array per year. Monopole, self support and guy towers have different rates for setting assessed value. A relay or antennae set on a silo or pole is not assessed. If there is no lease agreement then the tower assessment has to go to the landowner but for the most part the assessment for the antennae arrays (real estate) go directly to the companies who own the equipment. There are no building permits required for towers unless the Town specifically by Town Law requires one. NYS Building Code does not require fencing of towers here again, unless there is a local law. Set backs

are 50 feet from a ROW and 10 feet from property lines. With a tower installation however, all setbacks should be required to be at least the height of the tower plus a cushion from road right of way, property lines and all structures unless the structure is part of the tower installation. Towns can enact local laws to require building permits. If this were practiced, then the County Planning Board might have the opportunity to review the proposal and provide input into suggesting the sharing of towers, negotiation of 911 usage and to reinforce safety issues such as fencing. There is the County new business construction exemption which benefits tower and antennae installers significantly, and may be another point at which the County could negotiate access for enhanced 911 and public works communications. The County by resolution could request Towns to require building permits for tower installations. Some additional points made were:

- Suggested values for each array of antennas are $1,000 to $1,800 per month. The average of $1,800 per array per year could be viewed as under assessed, it is, however, the assessor who determines this value.
- Fiber Optic cable, when on the public ROW, gets a NYS advisory appraisal from NYS for use by local assessor who also utilizes Roll Section 5 and 6 Special Franchise and Public Utility values.

Part 10. Meeting with Southern Tier West Regional Planning and Development regarding Broad Band access for the public.

Report investigators Teller and Sinclair met with Executive Director of STW Richard Zink. The initial discussion involved the installation of the new ION Fiber Optic cable across the Southern Tier. For the most part this 96 strand fiber installation is getting permits on County ROW, however, there have been sticking points however, where some small villages with their own poles, wanted to charge franchise fees. This was under negotiation and as of the writing of this report it is still unsure if these fees will affect the hookup of the Wellsville SUNY campus and the Wellsville Hospital. Apparently the Villages want a franchise fee in addition to the normal pole fee. Allegany County has pursued the contract wording between ION and the Federal Stimulus program but has not been able to gain access to it. Senators and Congressmen seem also unable to get a hold of the Contract. Conversations have been held with ION and with the installer and the final route of the fiber has been finalized and provided. (See Appendix D). In discussing access to the main fiber cable, we were informed that the installation of the trunk was presently the focus and the best they could do for future connectivity was to provide loops in the line which facilitates future splicing. The County Communications Committee and office of Development agreed to provide important loop locations. There are natural splices every 1,000 feet in aerial cable and every 2,000 feet underground. Connectivity from NYS Rt. 244 and NYS Rt. 19 in Belmont to the County Office building and the Emergency Services complex, as they are some distance from the trunk line, was of concern. As the project evolved, however, Consultant Scott Teller solved this problem by outlining how the County Crossroads Center is within a stone throw of the cable as it heads north on Rt 19 and setting up a POP at that location could give the County opportunity to benefit from the fiber cable in many ways. The question arises if the County has the ability to manage the equipment and fiber. This is most likely best done by a private provider. You don't just get access to fiber and plug it into a port and everything is up and going. This could represent a business opportunity for a local company to manage access to the fiber and provide the needed level of service for government and private hookups. It is essential to capitalize on the capability of the fiber.
There are at least three existing Finger Lakes Region technology providers. The installation of the Ion fiber makes the playing field level and provides competition which should improve the cost of access to expanded bandwidth. Second level companies will most likely handle the connectivity. It won't be unusual to see 10 Megs in every house to meet the needs of the future. The capacity in fiber is endless and it is only the equipment along the way that defines the extent of capability and service.

The need for redundancy in the emergency frequencies and 911 can be resolved via the installation of ROIP base radios with internet addresses (IP) and the connection of the 911 towers with the fiber optic cable. Band width can also be fed via these connections to Town halls, fire halls, police stations, and shelters. The possibilities of these connections are breathtaking!

Additional issues and important points brought out in the conversation were:

- Focus on how things will grow out in the future and how can it be facilitated.
- Saia runs signal from Buffalo to Allegany County as a Tier 1 Internet system and there is also very little usage of this capacity.
- County owned towers would be extremely useful to Southern tier Wireless or other commercial entities. The County needs to establish policy and agreements.
- The tower in Rushford could be part of barter for 911 usage
- The offering of space to Southern Tier West is a good example however there are areas which would need refinement.
- The NED tower on Ackerman Hill should be procured by the County or IDA for system expansion and redundancy.
- The next phase for STW is to service the Bolivar Richburg area. From the Ackerman tower STW could reach to a sub tower in that region.
- Little Genesee is still a blank area and nearby Cattaraugus areas are the next priority for Southern Tier West. (See Appendix F)
- Just over the border in Pa. there is a company that is enhancing broadband which has been installed but the control of the network is a mystery. There is a great opportunity for commercial activity there which could impact NY also.
- There is a lot of Early Warning System infrastructure which is now defunct, doing nothing! (See Alma Hill Tower in Appendix E)
- Appalachian Regional Commission has assisted local Highway systems to improve and in some cases begin connectivity to wireless. It is now about filling in the small isolated towns. Southern Tier West can only do so much!
- Side valley Connectivity for the private landowner is an opportunity for business development and as regional and local economic development people we need to be thinking about this. The $25,000 per mile to run fiber with individual connections for homes on top of that represents significant investment. The spacing and nature of the population makes it hard to support fiber, unless there is a hybrid wireless over fiber system developed and tailored to each location.
- As Southern Tier West completes our present wireless broadband project, and ION completes the installation of the fiber optic cable, we need to take a hard look at where we are and what course to plot!

COMMUNICATIONS REPORT
Part 11. Conclusions and Recommendations

There are myriad facts, observations, conclusions and recommendations included in the body of the Report which are important to a complete understanding of the communications overview. The following listing is a sampling and summary of priority points on which we can continue the work.

Conclusion 1:
Allegany County put together an extensive RFP for the upgrade of the Emergency 911 system and related public service communications. It is the intention of the County to move critical communications from low bandwidth to high bandwidth analogue and eventually to digital which will greatly enhance rates and types of data transfer. Saia Communications submitted, in response to this proposal, a system configuration which provided for much of the conversion while also allowing for a phased transition, maintaining interoperability, until all equipment and systems had been converted. It is noted that in order to fully implement a digital (P-25 compliant system), additional equipment and expanded ability to broadcast signal (towers) would be needed. The inventory of towers, which is a section of this report, (Appendix B) has revealed that there is too many (impact to view shed) and a vast underutilization of already installed towers, with several exhibiting no active antennas

Recommendation 1:
The County should sponsor a resolution requesting all Towns to require that building Permits be issued for new tower installations. Code requirements for implementation of safety measures (fencing etc.) should be put in place for the sake of public safety. Part of that permitting process should include review by the County Planning Board, at which point, the County could seek to negotiate usage of the tower for 911 and emergency communications. The County should identify and make contact with strategically located, privately owned, tower locations and contact owners, in order to negotiate possible use for 911 and emergency communications.

Conclusion 2:
There is a lot of new County equipment and support infrastructure being put in place and there is no central or responsible party for performance of routine maintenance and inspection. Also, the insurance coverage for the expanded system warrants review and should include recommendations for minimizing liability.

Recommendation 2:
The County should establish routine inspection schedules and a checklist to insure adequate inspection and servicing of the systems and support infrastructure. This will involve trained County personnel and or contractual arrangements. The County Insurance consultant and officials who coordinate coverage should handle updating of the insurance coverage.

Conclusion 3:
The backup emergency control center for the 911 system will remain at the existing control room in the County Office Building. The equipment presently at that location may remain in service until upgraded and is somewhat different than the main control room at the Public Safety Complex.

Recommendation 3:
Dispatchers should be routinely detailed (rotated) to the backup command center so that they will maintain familiarity with all equipment and the operation of both control centers.

Conclusion 4:
The County IT department is assuming more responsibility for the troubleshooting and maintenance of the emergency communications system. It is predicted that with full system function and build out, in the near future, there will be a need for additional trained IT staff. There is also the need for contractual consulting services, involving technical experts/ Venders, to provide for more complicated problem solving and system management. It has also been further concluded that there is a need for technical oversight and coordination from one central location or County team.

Recommendation 4:
The County needs to plan on expansion of the trained IT staff and provide that team with access to advanced technical training for staff as well as the contractual technical expertise they may require. An "in house" team should be appointed to oversee the continued development of the communications system and that team must be capable of providing technically savvy leadership and policy recommendations.

Conclusion 5:
County policies for computer safety and guidelines for usage are being broken and no enforcement is forthcoming, to support maintenance of a secure system.

Recommendation 5:
The County Computer Policies need to be strictly enforced and penalties imposed in cases of abuse or violation of rules for system users.

Conclusion 6:
The enhanced broad band simulcast analog system has some redundancy in place, however, a fully redundant system for maintaining contact, under myriad system failure scenarios, is essential.

Recommendation 6:
The issue of redundancy within the network can be significantly resolved by making connection with the fiber optic network (ION) presently being installed in the County. There is an opportunity of becoming a Point of Presence (POP) for ION which should

be a top priority for the County. The fiber is being installed in close proximity to the Crossroads center and from there a microwave hop can connect the County Office Building and the Public Safety Complex. Access to the internet could be provided via this POP and could represent a significant reduction in communications costs for the County, fire halls, ambulance sites, shelters and other municipalities.

Review of the study Emergency Communications: Broadband and the future of 911, published by the Congressional Research Service, reveals a federal focus which goes beyond P -25 compliance to "Next Generation 911" In this study they state: "Today's 911 system is built on an infrastructure of analog technology that does not support many of the features which most Americans expect to be part of an emergency response. Efforts to splice newer, digital technologies onto this aging infrastructure have created points of failure where a call can be dropped or misdirected, sometimes with tragic consequences. Callers to 911, however, generally assume that the newer technologies that they are using to place a call are matched by the same level of technology at the 911 call center, known as Pubic Safety Answering Points (PSAPs). This, however, this is not always the case. To modernize the system to provide the quality of service that approaches the expectations of its users will require that the PSAPs, and state, local, and possibly federal emergency communications authorities invest in new technologies. Next Generation 911 or NG9-1-1 should incorporate Internet Protocol (IP) standards. An IP enabled emergency communications network that supports 911 will facilitate interoperability and system resilience; improve connections between 911 call centers; provide more robust capacity; and offer flexibility in receiving and managing calls. The same network can also serve wireless broadband communications for public safety and other emergency personnel as well as other purposes."
"Other types of citizen-activated emergency calls are handled in call centers. Increasingly many calls for assistance are placed by calling 211. The number has been provisionally designated for community information and referrals. Service levels and response times for 211 calls would benefit from a transition to IP-enabled networks and in many cases could share infrastructure with 911 networks." "These IP enabled networks rely on the same type of network connections as business and consumer access to the Internet and can share capacity with other users. Broadband connections built to a school, library, or hospital can also reach a 911 call center. Deploying NG9-1-1 is seen as an integral part of national broadband policy. Network facilities dedicated to 911, or even exclusively to public safety are not considered cost effective."
"Implementing NG9-1-1 will require not only the development of an IP enabled network and systems but will also entail changes in operational procedures, training, funding models, and state-and possibly federal-regulations and laws." "The capital for these investments may come from 911 or E-911 fees paid by subscribers into state 911 funds; the funds are also utilized for operating costs. State grants and local fund raising initiatives are other sources for capital investment and operating costs."

Conclusion 7:
The communications network in the County is critical to the function of government, public works, emergency response, law enforcement and public safety. The timely and effective management of these systems should be a top priority.

Recommendation 7:
A computer based software program for the road mapping of the entire IT based system, for monitoring and address checking, is greatly needed. Such a system would allow efficient tracking and troubleshooting by IT, vendors and system administrators.

Conclusion 8:
The status of neighboring counties and other systems needs to be considered in terms of maintaining and upgrading related communications systems connectivity and coverage.

Recommendation 8:
There needs to be solid inter-county communications capability between all immediate neighbors and regional interoperability maintained with the possibility of shared bases of operation. The Tri-County shared services committee thru Southern Tier West warrants strong support.

Conclusion 9:
The proper management of the infrastructure of the communications network is critical to reliable function. The worst danger is children and towers and every protection and caution needs to be in place, inspected and maintained. Lowering ice loading on towers, in our control, is extremely important to the safety and longevity of the tower.

Recommendation 9:
A system and budget for upkeep, inspection and maintenance should be established, a checklist and log kept of inspections and generator maintenance. Any equipment on towers which can be removed or upgraded with a lighter, smaller footprint should be.

Conclusion 10:
The entire area of relationships, monitoring and dispatch needs to be refined. School bus communications and shelters should be included. Communications can be severed during major events due to inability to filter and control chatter.

Recommendation 10:
Collaboration and agreement as to policy and procedure, between users, should be established. A special dispatcher should be available for County, Towns and Villages to call into service during wide area emergencies. This would relieve 911 and enhance the response and function for these other responders.