Interoperability Assessment Options Report

Rensselaer County, New York

Report

August 6, 2019

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1 Introduction

Rensselaer County is in the process of compiling and assessing various interoperability enhancement options in support of Public Safety communications throughout the County. These interoperability options are adjunct to the existing Motorola Project 25 countywide radio system currently in use.

Although the primary focus of these options is to enhance and facilitate interoperable communications among Rensselaer County and its regional partners, coverage issues may also be improved to some degree with each option.

This report is intended to identify all available interoperability options, their benefits and challenges, and their impact on identified coverage areas that could be improved.

The coverage problem areas noted in this report are consistent with the results of the Motorola contractual Coverage Acceptance Test Plan (CATP) process. The coverage also is compliant with the contractual requirement of 95% portable on street coverage. All coverage issues are related to the portable only, not the mobile.

2 Coverage Challenges

The following is a list of areas within Rensselaer County where coverage has been reported to be challenging.

- North Greenbush
- Village of Hoosick
- Nassau Village
- Town of Schodack
- City of Rensselaer (in-building only)
- City of Troy (in-building only)

2.1 North Greenbush

Coverage issues have been reported in the Town of North Greenbush, in the area of Route 66, from the Hannaford Supermarket to Wynantskill Fire Station located on Church Street.

Coverage issues along Main Avenue in North Greenbush have delayed full implementation of the move of law enforcement to the County 800 MHz system.

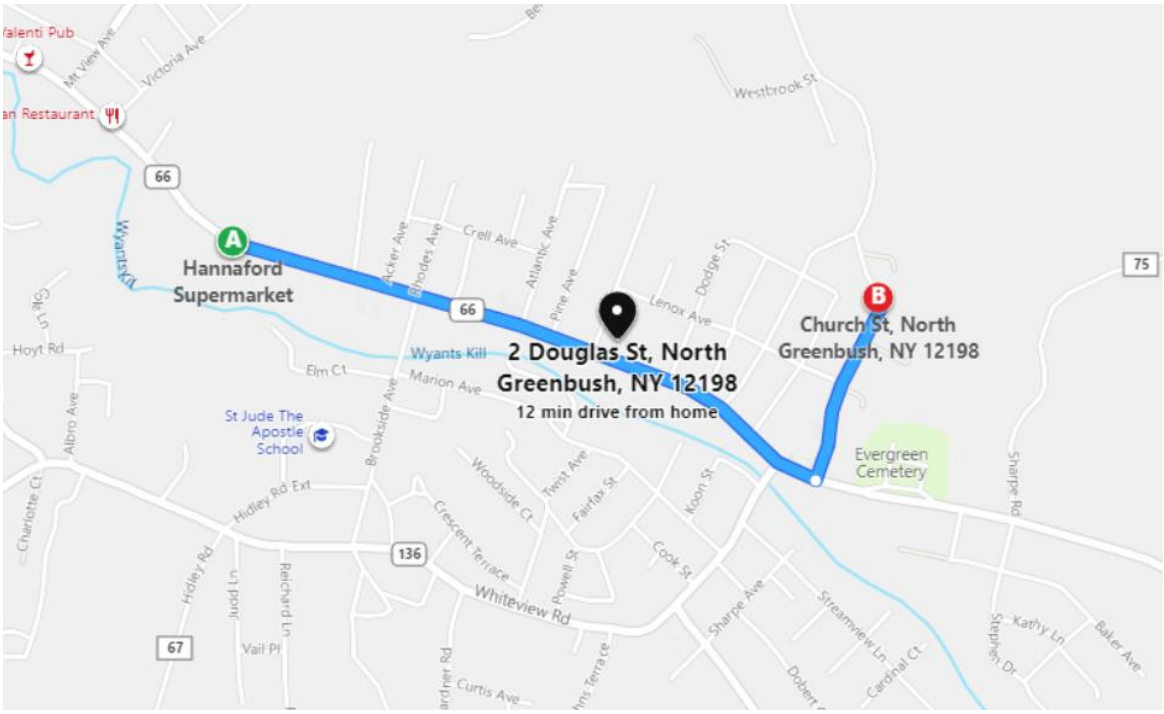

Figure 2-1: Coverage Issue - North Greenbush

2.2 Village of Hoosick

Coverage issues have been identified in the Village of Hoosick on NY Route 7, from Babcock Lake Road to Hill Road.

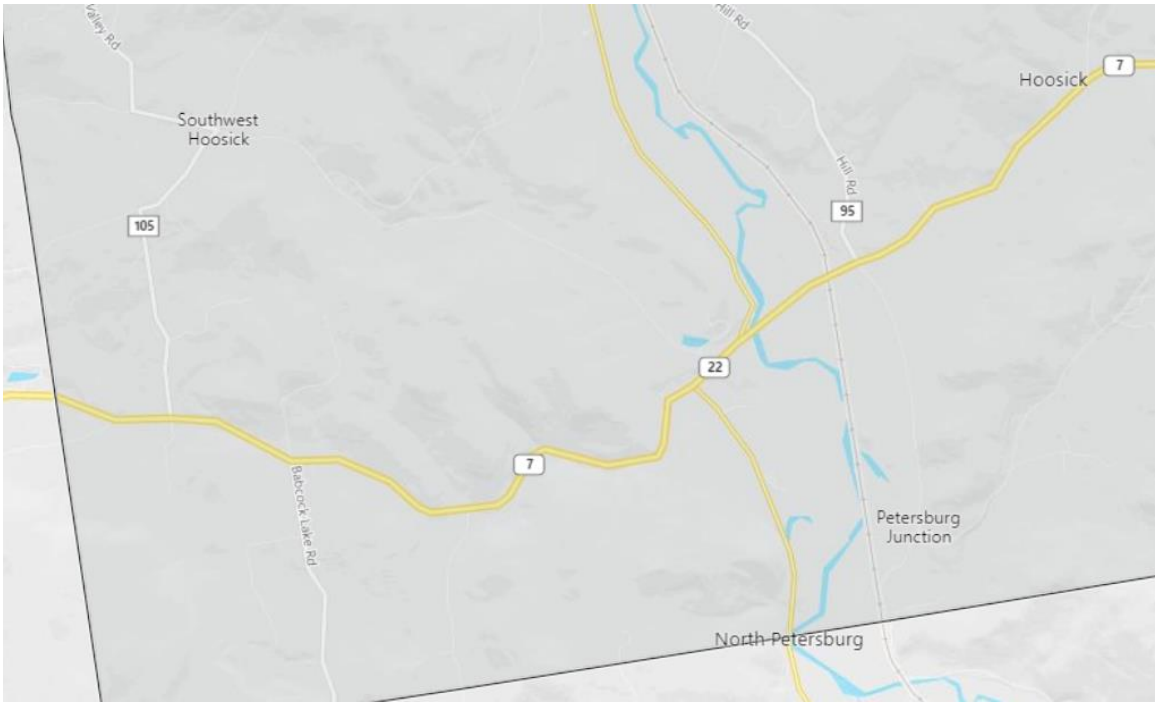

Figure 2-2: Coverage Issue - Village of Hoosick

2.3 Village of Nassau

Coverage issues have been reported in the Village of Nassau on Chatham Street, from NY Route 20 to the County line.

Figure 2-3: Coverage Issue - Village of Nassau

2.4 Town of Schodack

Coverage issues have been reported in the Town of Schodack on the New York State (NYS) Thruway, from the County line to the Hudson River.

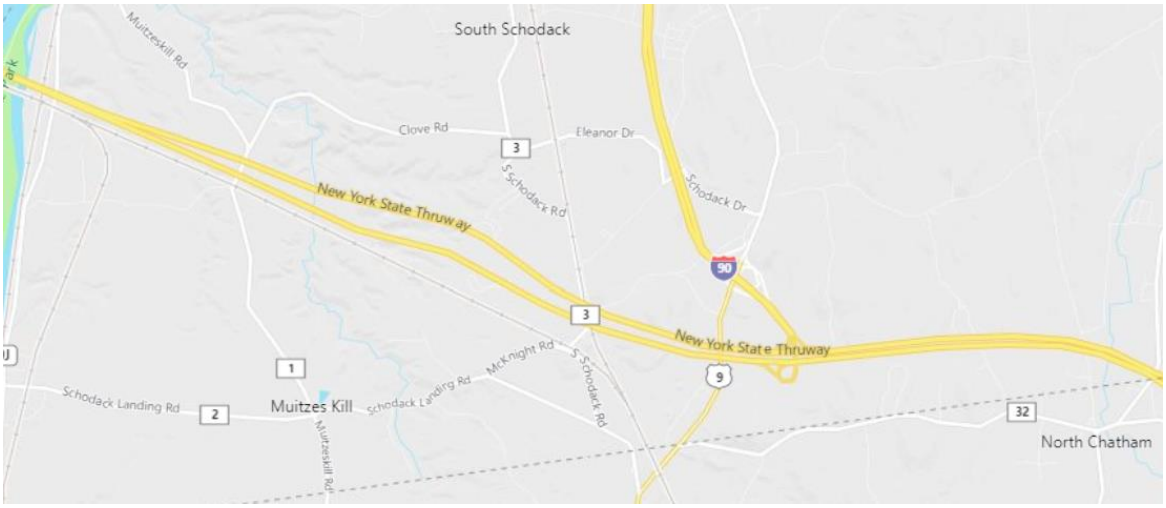

Figure 2-4: Coverage Issue - Town of Schodack

2.5 City of Rensselaer

The City of Rensselaer has reported challenges with their in-building coverage. The City operates a site in Empire State Plaza for their Motorola UHF radio system. 800 MHz coverage would need to match or exceed what they have today with UHF. The existing County 800 MHz system does not provide in-building coverage as well as the City's UHF system. However, Albany County's 800 MHz City Metro-Cell works better in-building than UHF. City can operate autonomously on the Albany County Metro-Cell.

Coverage performance of existing radio systems (best to worst):

- Albany County City Metro-Cell
- City UHF System from Empire State Plaza
- Rensselaer County 800 MHz system

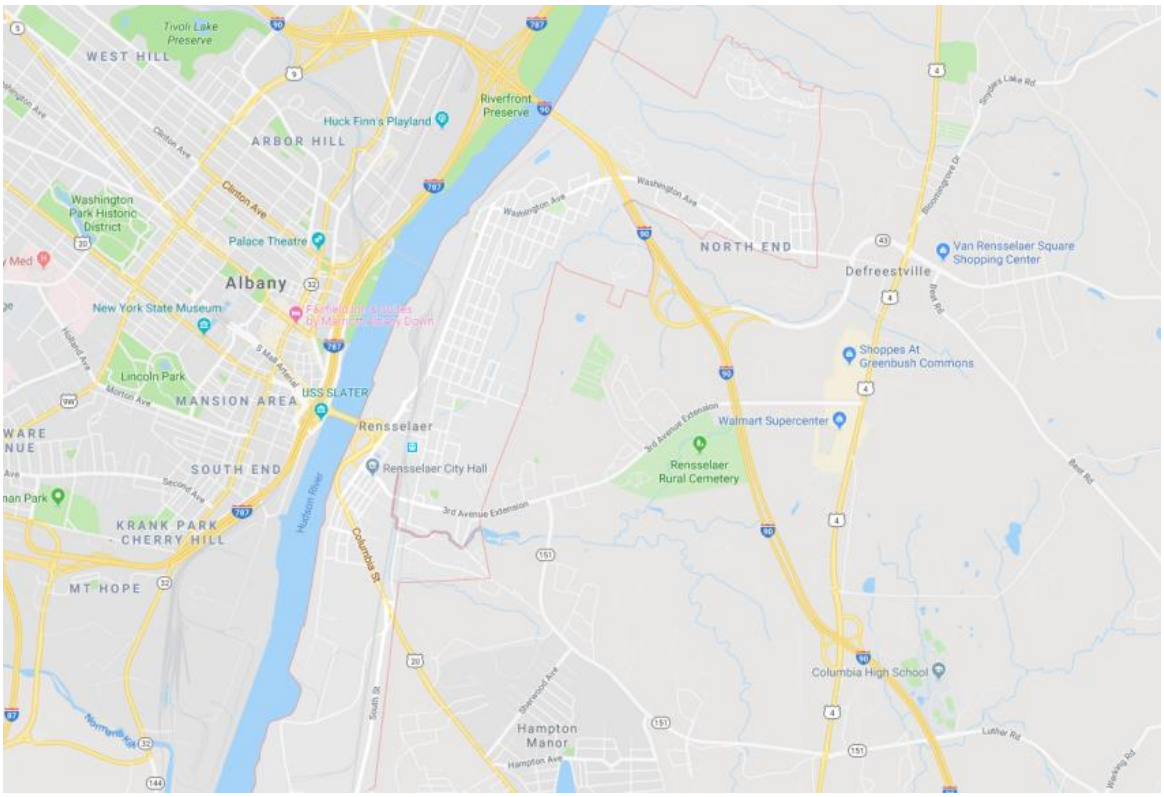

Figure 2-5: City of Rensselaer

2.6 City of Troy

The City of Troy has also reported challenges with their in-building coverage.

Troy PD is on a Harris 800 MHz EDACS, Troy Fire is on conventional UHF. Both legacy systems have better in-building coverage than the County 800 MHz system. Albany County operates an 800 MHz site on the WRPI tower. This tower solves the North Greenbush problem, but not completely. Albany County also operates an 800 MHz ASR site at Cohoes. It is possible to upgrade the ASR site in Cohoes on a high rise building which provides better coverage. Further, the Albany Metro-Cell provides good in -building coverage for most of Troy, however this coverage performance is still under evaluation by the City.

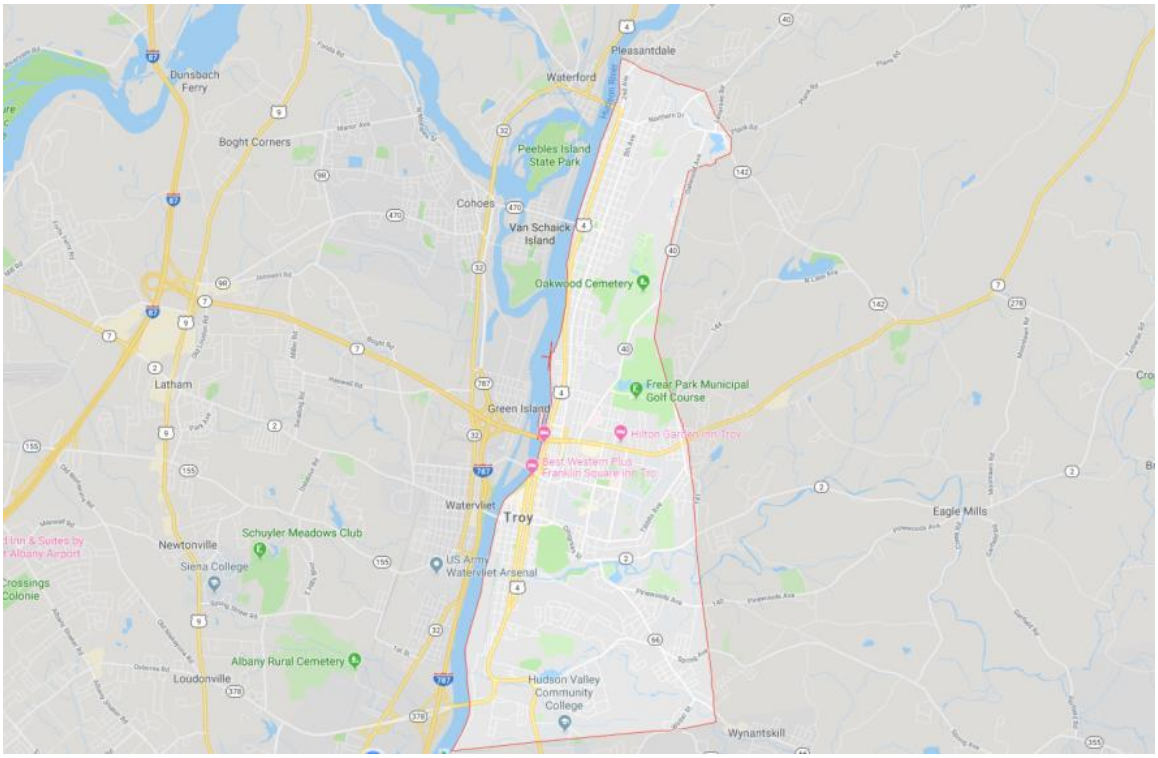

Figure 2-6: City of Troy

3 Interoperability Options

Rensselaer County has been working with the State of New York's Office of Interoperable and Emergency Communications (OIEC) on various interoperability solutions. During recent meetings, the County was asked to compile a list of interoperability options and present them to OIEC for consideration. Until that list is presented, and the OIEC evaluates each option, no grant funding will be reserved. Therefore, this effort is time sensitive and presenting interoperability options to OIEC for potential grant funding is a priority.

This section presents the interoperability options that are being considered for the County. Benefits and drawbacks are also included in the description of each options. Section 4 of this report provides a comparison of these options with the interoperability and coverage challenges the County is currently facing.

3.1 Interoperability Options

3.1.1 Status Quo

No enhancements to interoperability are made. Coverage also remains as it currently exists.

- **Benefits:** No cost or coordination required.
- **Challenges:** Interoperability and coverage remain in their current state, which is not satisfactory. The City of Rensselaer and the City of Troy will not join the County radio system if coverage and interoperability improvements are not made. North Greenbush will continue to require a patch to interoperate with 800 MHz system users.

3.1.2 Cross Patch System Programming

Rensselaer County continues to share programming information to address specific agency needs, such as Port of Albany, City Mutual Aid, etc.

- **Benefits:** Lower cost and timely solution since much of what is needed to implement this solution is already in place.
- **Challenges:** According to Motorola, the County's existing radios can only be programmed for 2 separate systems or fleets, so the expansion of this option is very limited.

3.1.3 Shared Infrastructure

Rensselaer County is currently providing radio system access to Saratoga County to enhance coverage issues in the Mechanicville Area, at no cost. Albany County has indicated a similar arrangement for the City of Rensselaer (Albany Metro Cell) and City of Troy (ASR site at Cohoes) to improve coverage in those jurisdictions. However, utilizing the Albany County 800 MHz radio system would result in a $200 per radio, per year, system access charge. It is possible that this fee could be negotiated, it does currently exist. This option is enhanced by the use of control stations and CCGW gateways at Dispatch Centers, allowing for Dispatchers to access and use neighboring county systems.

- **Benefits:** Similar to the system programming option, implementation costs are lower and the timeframe to implement is short since all components are in place today.
- **Challenges:** Entities that require the use of the Albany County 800 MHz radio system will be required to pay a fee, $200 per radio, per year. Solutions for Rensselaer County Dispatch will also need to be determined. This option also requires the radio user to manually switch between systems depending on location and the subsequent coverage they require. Also does not address the coverage issues in North Greenbush.

3.1.4 Shared Core

A proposed interoperability configuration that centers on multiple entities sharing a Motorola radio system Core has been presented and discussed. This proposed approach is being called the Capital District Shared Core Project. With this approach, Rensselaer County would surrender its existing Core and would connect to a regional Core, managed by Albany County. Saratoga County's existing Core would remain in place and act as a backup to the Albany County Core. The shared core concept would provide a 4-county system (Albany, Rensselaer, Saratoga and Schenectady) with standard access throughout the 4-county region. The shared core would also allow access to Albany County and/or Saratoga County sites to improve coverage in overlapping areas, such as Along the Hudson River.

- **Benefits:** A significant benefit of the shared core for Rensselaer County would be to improve coverage in the City of Troy, City of Rensselaer and North Greenbush where there are coverage deficiencies. Rensselaer and Troy agencies operate on independent legacy UHF systems that provide superior in building coverage than the County's 800 MHz system. Rensselaer FD and PD have tested the Albany Metro-Cell and found coverage equal or better than the UHF Legacy System. Also, Albany County's Metro-Cell and the ASR site at the WRPI tower in North

Greenbush will provide needed coverage solutions in Rensselaer, North Greenbush and most of Troy. Troy FD is testing the Metro-Cell coverage. Troy PD maintains an analog 800 MHz Harris system that is incompatible with Motorola systems. This approach provides a seamless interoperability solution among systems manufactured by Motorola. Inter-system functionality is transparent.

- **Challenges:** The biggest challenge to this approach is the loss of the County's Core, which was just purchased and installed. Further, this approach would hinder the County's ability to govern and manage its radio system and will increase maintenance costs. Motorola will need to provide a specific cost of maintenance over and above what Rensselaer County currently prepaid in the 10-year radio system contract. The City of Troy is currently testing coverage performance from Albany County and Saratoga County. If a Saratoga County site does not provide coverage, it is possible an additional site will be needed to fully cover Troy with the required in-building coverage. This option also creates a dependency for all systems to be upgraded if one system is upgraded. Therefore, Rensselaer County will be forced to spend money to upgrade its infrastructure if other counties elect to upgrade the system. In short, Rensselaer County would lose its ability to decide if, and when, a system upgrade is implemented.

3.1.5 Inter Subsystem Interface (ISSI)

An Inter subsystem Interface (ISSI) can be used to interconnect two P25 radio systems, without the requirement of systems being provided by the same manufacturer. The ISSI has evolved over the years and supports more features (caller ID, roaming, etc.) today than in previous iterations.

- **Benefits:** Systems connected via ISSI are not dependent upon one another for system upgrades. In other words, each connected system can be upgraded independently of the other. The ISSI connection allows for a reasonably complete set of features and functions for radio users.
- **Challenges:** ISSI connections are typically expensive. For example, in Rensselaer County, one ISSI device needed in each county for each system (total of 6). The total cost for a single ISSI connection is a significant investment. Maintenance is not typically included in the price of an ISSI. Further, different manufacturers use different tactics, methodology, and terminology as they design and deploy their systems. Therefore, challenges may occur as manufacturers attempt to connect their systems and configure them for operation.

3.1.6 Additional Radio Sites

Constructing additional radio sites can be considered to improve coverage for the County's interoperability partners in the region. If Rensselaer County's system coverage improves to the point that neighboring jurisdictions can affiliate and use it, interoperability is enhanced.

Engineering and design work would be required to determine a necessary site configuration that provides the required coverage for the areas referenced in this report. It is possible that enhanced coverage for Troy would also solve the North Greenbush coverage problem, but this would need to be validated. Sites would likely be needed in the City of Rensselaer, South Troy and North Troy. These costs would be substantial for build out and maintenance. This also may present grant funding limitations in that infrastructure will be duplicated.

- **Benefits:** Flexibility in choosing how and where to enhance coverage.
- **Challenges:** Expensive and time-consuming option. Building additional sites has proven to be an extremely protracted process. As such, it may be years before this option comes to fruition. This option also requires FCC licensing modifications that may or may not be possible. Finally, connectivity will need to be addressed for any new sites.

4 Analysis and Comparison

Below is a matrix that presents the various interoperability options with how they benefit the goals of improving coverage as well as interoperability in the Region.

Interoperability Option	Budgetary Cost	City of Rensselaer	City of Troy	North Greenbush	Hoosick	Nassau	Schodack
Status Quo	$ -	no improvement	no improvement	no improvement	no improvement	no improvement	no improvement
Cross Patch System Programming	$ -	Improves coverage along the Hudson River					
Shared Infrastructure	$ -			Only partially improves coverage in this area			
Shared Core	$ -						
ISSI	$ -						
Additional Radio Sites	$ -						

Interoperability Benefit	
Coverage Benefit	
Both	