Commonwealth of Massachusetts
State 911 Department
North Shore Regional 911 Center

Manchester-by-the-Sea
FEASIBILITY STUDY

Prepared: February 9, 2022

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EXECUTIVE SUMMARY

In 2011, five communities within Essex County, Massachusetts formed a partnership to consolidate their emergency communications operations and establish a Regional Emergency Communication Center (RECC) that would later be called North Shore Regional 911 Center (NSR911). Those communities include the city of Amesbury and the towns of Essex, Middleton, Topsfield, and Wenham. Between 2011 and 2013 construction of a new dispatch center was completed in the Town of Middleton. In June 2013, the RECC commenced operations at its emergency communications facility in the Town of Middleton and serves as the primary Public Safety Answering Point (PSAP) for all wireless and wireline 911 calls that originate within Amesbury, Essex, Middleton, Topsfield, and Wenham. Since its inception and successful operation, other communities have expressed interest in becoming a partner in the NSR911. Most recently, the Town of Manchester-by-the-Sea (Manchester), MA submitted a letter of intent to integrate their 911 call taking and dispatch operations into NSR911.

The center's Executive Advisory Board has developed protocols for communities of interest. Part of the protocol includes a feasibility study of the candidate community. NSR911 was tasked to provide an evaluation of integrating Manchester's emergency communications operation into NSR911. The evaluation includes migrating the Town of Manchester's Police and Fire departments' 911 communications and dispatch. Operation and system evaluation surveys were distributed to stakeholders in Manchester to capture the current technology, operational environment, and statistics.

Data collected was analyzed by NSR911 and compiled into this report, which identified the operational and technical objectives for integrating the Manchester emergency communications operations into NSR911. When possible, and applicable, cost estimates necessary to complete the onboarding process were notated.

It is NSR911's opinion that Manchester would benefit from added technology and capabilities by joining NSR911. Member communities and Manchester would also benefit from having greater situational awareness and crime analytic tools. Should the Town of Manchester transition, they would have the benefit of having all their incidents captured in one state-of-the-art CAD system, without having to make a significant investment by the community to accomplish this. Further, emergency responders would gain increased situational awareness through the use of mobile data terminals in police, fire, and EMS apparatus procured by NSR911. This is a significant savings to the Town of Manchester in not having to procure these costly systems independently and maintain them for years to come.

The below table identifies a high-level summary of estimated annual recurring charges (ARC) and non-recurring charges (NRC) that NSR911 expects to incur. **These are charges that would be paid for by NSR911 with no cost required for Manchester for onboarding.**

Table 1 - Total NSR911 Estimated Integration Costs

Category	Estimated ARC	Estimated NRC
Technology Costs (Table 8)	$81,505	$543,970
Additional Personnel Costs (See §4)	$0	$0
Total Estimates	**$81,505**	**$543,970**

1. PROJECT OVERVIEW

1.1 Background

As a result of discussions between the Town of Manchester and North Shore Regional 911 Center (NSR911), the Town of Manchester is strongly considering transferring its emergency communications services to NSR911. The NSR911, fully operational since 2013, seeks to determine the impact of providing services to the Town of Manchester from technological, staffing, spatial, and fiscal perspectives. NSR911 is conducting this assessment after receiving a Letter of Intent on October 28, 2021, and subsequent data from the Town of Manchester. The scope of NSR911's effort is outlined in the subsequent sections.

1.2 Scope of Work

NSR911 conducted an assessment that contains the following components:

1. Community Overview

A review of the Town of Manchester's demographics was conducted. This review included population factoring seasonal influxes, number of schools/colleges, population density, and the number of roadway/limited access mileage.

2. Technology

Inventoried and assessed the PSAP technology currently in place in the Town of Manchester to determine the level of effort needed to procure equipment and/or create interfaces with existing systems should a move to NSR911 occur. Key PSAP equipment assessed included computer-aided dispatch (CAD), records management system (RMS), associated interfaces, network topography, mobile data terminals (MDTs), and radio infrastructure. NSR911 also assessed whether the community would require data conversion to migrate existing CAD/RMS data into NSR911's software.

3. Staffing Analysis

Based on the anticipated Manchester call volume and dispatch responsibilities, NSR911 assessed existing staffing and, utilizing industry-approved calculators, determined whether increased staffing would be necessary. Staffing telecommunicators to cover Manchester's emergency communications operation involves analyzing multiple factors, such as paid time off, shift duration and breaks, and meeting existing performance standards within NSR911.

Apart from operational concerns, other personnel and administrative considerations must be taken into account. These include potentially hiring new employees by NSR911, as well as certification and training needed. Ancillary duties performed by Manchester dispatch personnel that would need to be addressed with a move to NSR911 were also identified.

4. Spatial Needs

NSR911 conducted an assessment of its facility's capacity to incorporate Manchester's operation with existing equipment and spatial parameters or whether additional workstations are needed to accommodate the increased workload. When considering spatial needs, dispatch floor space is only one component; sufficient parking, locker, bathroom, and break room capacity must be considered as well when taking on additional employees.

5. Transitional Cost Analysis

A detailed cost analysis of additional technology or enhancement to existing technology was conducted; additional personnel salary and benefits were estimated, and facility enhancements to accommodate the additional operational workload were calculated. The costs analysis not only includes those up-front costs to ensure the move of Manchester's emergency communications is a success, but also those recurring costs that NSR911 will incur annually by having Manchester as a partner in its operation.

1.3 Methodology

NSR911 personnel conducted their assessment using the following methodology:

- Distribution and subsequent analysis of data collection surveys provided to the Town of Manchester.
- Interviews with Manchester management and staff.
- Use of industry-approved staffing calculators and the costs of past projects and/or established state contract prices to develop accurate estimates.

1.4 Assumptions

Key assumptions that were factored into this assessment are:

- Those ancillary duties currently performed by Manchester PSAP staff and reported in their survey included handling walk-up window interactions, monitoring prison cells, answering calls for the municipality during off-hours, and property returns.
    - NSR911 would offer the following services:
        - Lobby interactions via camera/telephone
        - Answering business line calls provided they are routed through an auto-attendant
    - NSR911 would not provide the following services:
        - Monitoring prison cells
        - Property returns
        - Answering business calls for other town departments off hours.
        - Direct monitoring of alarms
- CAD, RMS, 911, and administrative call volumes were reviewed for calendar years 2019, 2020, and 2021.[1]

[1] NSR911 took into consideration that most call centers experienced significant decreases in call volume during 2020 and 2021 as the world dealt with COVID-19.

- ❖ Other than estimating staffing needs at NSR911, no assumptions concerning Manchester's staffing were made.
- ❖ Manchester would be responsible for its employees' salary costs while attending any training course and/or onboarding process.

2. CURRENT ENVIRONMENT

The following sections provide an overview of the existing emergency communications environment within the Town of Manchester and NSR911.

2.1 Town of Manchester

"Manchester-by-the-Sea is located in what is traditionally known as the "North Shore", approximately 30 miles from the City of Boston, within the county of Essex. Situated with a four community regional known as "Cape Ann" the Town is bordered by the communities of Beverly, Hamilton, Wenham, Essex and Gloucester. Manchester-by-the-Sea is a residential seashore community situated on the Atlantic Ocean encompassing approximately 8 square miles with approximately 12.8 miles of tidal shore line providing beaches, a perfect yachting haven, and commercial fishing. The Town is serviced by two state highways: a primary highway route 128 and a scenic highway route 127. The Town is also serviced by a commuter rail branch connecting directly to the City of Boston."[2] It is 9.23 square miles in size. Within the community, there are two elementary schools, one middle school, and one high school.

According to the US Census, the town's population grew by approximately 5% between 2010 and 2020. The 2020 population based on the US Census Bureau was 5,395. Based on the population divided by the square mileage, there is a population density of 584 residents per square mile. Manchester also noted a seasonal population influx of 2,000+ visitors during summer weekends.

Table 2 - Manchester Demographics

Manchester Demographics	
2020 Population (US Census)	5,395
Square Mileage of Community (US Census)	9.23
Population Density (Population/Sq Mi)	**584**

The Town maintains a primary PSAP at the Police Department (PD). The primary PSAP answers all 911 and 10-digit wireline calls for the Town of Manchester. On March 6, 2018, the town began processing all Wireless Phase 1 (WPH1) and Wireless Phase 2 (WPH2) calls.

[2] *About Manchester-by-the-Sea*. (n.d.). Retrieved November 24, 2021, from Manchester-by-the-Sea: http://www.manchester.ma.us/257/About-Manchester-by-the-Sea

All police, fire, and medical calls for service are processed and dispatched in-house. Staff telecommunicators also perform Emergency Medical Dispatch (EMD) duties for medical calls using APCO's EMD Program; this is the same program used by NSR911.

2.1.1 Police Department (Primary PSAP)

Between 2018 through 2020, the Manchester PD primary PSAP received an average of 1,150 911 calls. In 2020, Manchester handled 13,238 administrative telephone calls. Between the aforementioned calls and officer/firefighter initiated calls for service, Manchester PSAP handled 15,350 calls for service. The center also handles an average of 334 walk-ins at the station per year. Based on the figures provided by the police department the PSAP is handling an average of 3- 911 calls, 36 administrative telephone calls, 42 calls for service, and about 1 walk-in visit per day.

Table 3 – 2018-2020 Manchester PSAP Call Volume Summary

2018-2020 Manchester PSAP Call Volume Summary		
Type of Call Type	**Average Yearly Calls**	**Daily Average # of Calls**
911 Calls	1,150	3
Business Line Calls	13,238[3]	36
CAD Calls for Service	15,350	42
Station Walk-Ins	334	1
Total Annual Calls/Contacts	**30,072**	**~82**

Based on the last three (3) calendar years, the police department has averaged 9,511 reportable police incidents, 28 arrests, and 143 accidents per year. On a daily average, this equals about 19 reportable incidents, <1 arrest, and <1 accident per day.

Table 4 – 2018-2020 Manchester Police Incident Volume Summary

2018-2020 Manchester Police Incident Volume Summary		
Type of Call Type	**Average Yearly Incidents**	**Daily Average # of Incidents**
Police Incidents	9,511	19
Arrests Incidents	27.67	<1
Motor Vehicle Accidents Incidents	142.67	<1
Total Annual Incidents	**~9,681**	**~20**

The Police Department employs three (3) – full-time call takers/dispatchers, and utilizes nine (9) part-time/per diem call takers/dispatchers (telecommunicators). The PSAP is typically staffed by one telecommunicator 24 hours per day / 7 days per week. During storms and other critical incidents, staffing may be increased to two telecommunicators. Two operator positions are

[3] Manchester's was unable to report a count of administrative telephone calls prior to 2020.

equipped for both radio and call-taking functions. In addition to police and fire radio channels, dispatchers also monitor radios for the town's Department of Public Works (DPW), Marine Channel 16, and Marine Channel 9.

Twelve (12) full-time and thirteen (13) part-time / per diem officers cover the community. Staffing typically ranges from two (2) to three (3) officers working per shift.

2.1.1.1 Technology

The following technology is currently in place in the Manchester PSAP:

1. 911 Answering Equipment or Customer Premise Equipment

The Commonwealth of Massachusetts provides all 911 telephony equipment for the primary Manchester PSAP, also known as customer premise equipment (CPE).

2. Administrative Telephone Equipment

The Police Department and PSAP are supported by Poly VVX 350 IP-based administrative phone system which was installed in 2020 and updated in 2021. The Police Department does not currently use an auto-attendant on this phone system.

3. Computer-Aided Dispatch

The PSAP operates Microsystems' PRO-IV Computer-Aided Dispatch (CAD) system. The system was originally installed in 2000 and last updated in October 2021.

Manchester's CAD system currently provides interfaces to the following:

- Law Enforcement RMS
- Mobile Data Terminals (MDTs)
- Law Enforcement Field Reporting

4. Records Management System (RMS)

The Police Department utilizes Microsystem's Crime Track Records Management System. The system was originally installed in 2000 and last updated in October 2021.

Manchester utilizes the following modules within its RMS:

- Accident
- Arrest
- Bar Coding
- Booking
- Case Management
- Employee
- Fleet Maintenance
- Imaging/Photo Lineup
- Master Names
- Mugshot
- Property & Evidence
- Traffic Citation
- Traffic Warning

RMS is also interfaced with the following:

- CAD
- Courts
- NIBRS
- Property Room Bar Coding

5. Mobile Data Terminals (MDTs)

The Police Department has seven (7) vehicles of which all seven (7) are currently equipped with MDTs. Vehicles that are equipped with MDTs all have Microsystem's PRO-IV mobile software installed enabling officers to perform the following from the field:

- ❖ Add/update RMS records
- ❖ Incidents
- ❖ Cases

6. Radio System Infrastructure

The police department operates a duplex UHF radio system. The radio system infrastructure system consists of the main repeater (Kenwood Kairos KA500), a backup repeater (Kenwood Kairos KA500), and two (2) additional Kenwood Kairos KA500 receivers. This equipment was all installed in August 2021. The Kenwood Kairos radio system has a voting capability built into the system and does not require a separate comparator. The police department reported that while their radio infrastructure is new, there are coverage gaps in the Magnolia section of the town. They also reported that two of the radio sites lack redundant backhaul paths. Within the four (4) sites, there is one microwave link. All other links are via municipal fiber connections.

While conducting our survey, we noted that the primary repeater site had a battery backup (Uninterruptable Power Supply [UPS]), but lacked generator power. All other radio sites lacked battery backup. We also noted that one other receiver site lacked generator power. Because the primary repeater site does not have a standby generator, police and/or fire personnel are required to transport a portable generator and ensure it has sufficient fuel to remain powered.

7. Emergency Notification System

The town of Manchester utilizes Code Red as its Emergency Notification System, and indicated that it plans to continue utilizing this system.

2.1.1.2 PSAP Administrative Staffing

The police department anticipates that it will continue to staff its station 24/7 should it join NSR911. At this time, it is undetermined how citizen walk-ins or other ancillary duties would be handled.

2.1.1.3 Station Security

In a review of the police department lobby, a camera and intercom system would need to be installed and connected to NSR911's system. This would allow NSR911 staff to maintain visual contact with the lobby and interact with customers via an intercom system. The town also indicated that it would seek to install reinforced doors and windows in an effort to harden its lobby.

2.1.2 Fire Department

Between 2018 and 2020, Manchester FD handled approximately 1,846 incidents, 1,528 EMS calls, and 1,127 fire inspections. On a daily average, this equals about 1.4 reportable incidents, 1.2 EMS calls, and 1 fire inspection per day.

Table 5 - 2020 Manchester Fire Call Volume Summary

2020 Manchester Fire Call Volume Summary		
Type of Call Type	**Annual Average Volume**	**Daily Average Volume**
Fire Calls	515	1.4
EMS Calls	455	1.2
Fire Inspections	367	1
Total Call Volume	**1,337**	**3.6**

The Town of Manchester operates a municipal Advanced Life Support (ALS) ambulance service within the town.

Dispatchers operating out of the primary PSAP perform all call-taking, dispatching, and Emergency Medical Dispatch duties for all calls.

2.1.2.1 Technology

The following technology is currently in place at the Manchester FD:

1. Administrative Telephone Equipment

The Fire Department is supported by Poly VVX 350 IP-based administrative phone system which was installed in 2020 and updated in 2021. An auto-attendant is not currently used on this phone system.

2. Records Management System (RMS)

The Fire Department utilizes Firehouse's Records Management System[4]. The system was originally installed in 2006/2007 and last updated in 2020. This RMS system is not interfaced with the CAD system used by Manchester PSAP, causing firefighters to enter information already available in the Town's CAD software.

Manchester utilizes the following modules within its RMS:

- Query Building
- Report Writing
- Memorized Templates
- Automated tasks
- Reminders
- System Rules and default values
- User-defined fields
- Advanced security & audit tracking
- Advanced database functions
- Graphs

[4] It was reported that ESO, the parent company of Firehouse, will no longer support this RMS system beyond January 2022.

- ❖ Advanced mapping
- ❖ Import/export
- ❖ NFIRS Incident Reporting
- ❖ EMS Reporting
- ❖ Investigation records management
- ❖ Occupancy & Inspection management
- ❖ Training classes & Programs
- ❖ Staff Scheduling
- ❖ Apparatus, Equipment, & inventory
- ❖ Hydrant management

3. Mobile Data Terminals (MDTs)

The Fire Department has a fleet of six (6) active and one (1) reserve vehicles. The Town's two (2) Ambulances each have existing MDTs that are used for EMS Patient Care Reports. None of the apparatus have MDTs that are integrated with the Town's CAD system.

4. Radio System Infrastructure

The fire department operates a duplex UHF radio system. The radio system infrastructure system consists of the main repeater (Kenwood Kairos KA500), a backup repeater (Kenwood Kairos KA500), and two (2) additional Kenwood Kairos KA500 receivers. This equipment was all installed in August 2021. The Kenwood Kairos radio system has a voting capability built into the system and does not require a separate comparator. The fire department reported that the current radiofrequency (RF) coverage was adequate at this time. Within the four (4) sites, there is one microwave link. All other links are via fiber connections.

The fire department maintains one FCC call sign, WIG751. This license is currently active.

While conducting our survey, we noted that the primary repeater site had a battery backup (Uninterruptable Power Supply [UPS]), but lacked generator power. Other radio sites either lacked battery backup and/or generator power. Because the primary repeater site does not have a standby generator, police and/or fire personnel are required to transport a portable generator and ensure it has sufficient fuel to remain powered.

5. Fire Station Alerting

A custom-made Fire Station Alerting system (FSA) is used in Manchester. The system in place is made up of a tone generator and ramp-up module - triggered by a relay in the console. The console relay triggers lights inside the station and activates a tone generator for the station public address (PA) system. The console also sends out a two-tone radio page, which is delayed allowing relays within the station to be completed first

Manchester Fire Headquarters maintains a total of six (6) active apparatus.

2.1.3 Municipal Network Topography

1. Internet Service Provider (ISP)

The Town of Manchester utilizes Comcast coaxial cable for its Internet Service Provider (ISP) that provides sufficient bandwidth. Additionally, an internal fiber network connects town buildings. The availability of Manchester allocating a dedicated static IP address was discussed. Manchester

believes that they would be able to provide an IP address for connectivity between Manchester and NSR911.

2. Backup Power (UPS / Generator)

The municipality has Uninterruptable Power Supplies (UPS) installed at the police/fire stations. Generators power the police/fire station.

Discussions with town officials indicated that one radio site needed its batteries replaced, meanwhile, all other sites were up-to-date.

3. Redundant Internet Service Provider (ISP) Connectivity

The municipality relies on a single ISP connection. In discussions with town officials, they indicated a desire for a redundant internet connection in the event that their connection goes down.

2.2 Interest in Consolidation

The Town of Manchester has inquired about the potential of regionalization as a way to expand and update their communication and dispatch services.

During community discussions, the following concerns were expressed:

- Loss of local knowledge by PSAP staff.
- Potential job loss for three (3) telecommunicators.
- How would lobby interactions be handled?
- Familiarity of constituents.
- Ability to monitor Marine Channels 9 & 16

2.3 North Shore Regional 911 Center

NSR911 began operations in June 2013 with all-new technology supporting the communities served. NSR911 currently provides 911 call-taking and dispatch services for the towns of Essex, Middleton, Topsfield, and Wenham, and the city of Amesbury. The center also acts as one of three wireless PSAPs operated in the Commonwealth of Massachusetts.

In July 2019, the center transitioned under the management of the Commonwealth of Massachusetts' State 911 Department. The day-to-day operations are managed by a director and deputy director. The staff for NSR911 consists of forty-one civilian telecommunicators (call-taker/dispatchers). This number includes nine supervisor positions and call takers for the Wireless Center. The Wireless Center staff act as a "pre-PSAP" and triages calls for over 84 cities and towns north of Boston.

The Regional Operations handled 9,694 911 calls and 17,891 2-Way Emergency Calls during 2020. The following table summarizes the 2020 call volume handled by NSR911:

Table 6 - 2020 Annual NSR911 Call Volume Summary

2020 NSR911 Call Volume Summary	
Type of Call Type	**# of Calls**
Regional 911 Calls	**9,694**
Regional 2Way Calls	**17,891**
Total Annual Call	**27,585**

NSR911 staffs three telecommunicators in the Regional Operation and two telecommunicators in the Wireless Operation for the period of midnight until 08:00 hours. There are four telecommunicators in the Regional Operation and three in the Wireless Operation for the period of 08:00 until midnight. Additionally, there is always at least one supervisor working per shift. There are ten telecommunicator workstations in the Regional Operations Room. Nine of these positions are equipped with both radio and 911 call-taking equipment. Meanwhile, one position is equipped as a call-taker only (overflow) position.

2.3.1 Technology

The following sections provide an overview of the technology currently in place at the NSR911.

1. 911 Answering Equipment or Customer Premise Equipment

The Commonwealth of Massachusetts provides all the 911 CPE for PSAPs in the state, including NSR911. Connectivity into the 911 system is achieved through diverse routes to eliminate any single-point-of-failure.

The NSR911 has two core operational functions – the Regional Operation and the Wireless Center. Personnel within the Regional Operation process 911 calls from the communities served by NSR911, receive wireless 911 calls transferred from the Wireless Operation, and dispatch the public safety agencies served by NSR911.

There are 17 workstations at NSR911. Ten are in the Regional Operation and seven are in the Wireless Operation. Andover PSAP[5] acts as the alternate/backup PSAP for the Regional Operations, while Framingham PSAP Operations Division 1 (POD1) is the Wireless Operation's alternate PSAP, and the State 911 Maynard Facility is the Wireless Operation's backup PSAP.

2. Administrative Telephone Equipment

A state-of-the-art Voice over Internet Protocol (VoIP) telephone system is employed by NSR911. This system seamlessly connects with other member VoIP systems. To streamline operations, NSR911 has implemented auto-attendant telephone systems on all incoming business lines to include directions to "hang up and dial 911." This same request would be asked of Manchester.

[5] NSR911 maintains system-level connectivity with Andover PSAP. This provides radio and computer business continuity, in addition to the 911 system.

3. Computer-Aided Dispatch (CAD)

CentralSquare's IMC CAD system is used by NSR911. It also includes a mobile data solution.

The following is a list of CAD modules provided by NSR911:

- CAD Call Taking/Dispatching Client
- CAD Mapping
- ODBC Data Dictionary Files (DDF's)

The following is a list of CAD/RMS interfaces provided by NSR911:

- CAD Server interface to Fire RMS Server
- CAD Server interface to Police RMS Server
- Zoll electronic Patient Care Reports (ePCR)
- LiveScan
- Field Ops
- Fire Station Alerting (Zetron)
- NCIC State Interface
- Paging
- Electronic Application for Criminal Complaints (EACC)
- Crash Report submission
- Automatic Vehicle Location (AVL)[6]
- Statewide Information Sharing System (SWISS)

4. Law Records Management System (RMS)

NSR911 also utilizes CentralSquare's IMC Law Enforcement Records Management System. The system was originally installed in 2019 and last updated in 2021.

The following is a list of RMS modules provided by NSR911:

- Accident
- Arrest
- Bar Coding
- Booking
- Case Management
- Crime Analysis
- Detective / Internal Affairs
- Employee
- Gang Tracking
- Mobile Mapping Client
- Internal Affairs
- Law Administration
- Law Imaging and Photo Lineup
- Licensing and Permits
- Master Names
- Master Vehicle Index
- Mobile Field Reporting
- Mobile – Law, Fire, and EMS Clients
- Mugshot
- ODBC Data Dictionary Files (DDF's)
- Parking
- Property & Evidence
- Traffic Citation
- Traffic Warning
- Training
- Warrants

5. Fire Records Management System (RMS)

Fire Records Management System is provided by CentralSquare's IMC product. The system was originally installed in 2019 and last updated in 2021.

[6] IMC's CAD system is capable of AVL reporting; however, no departments currently use this feature.

NSR911 utilizes the following modules within its RMS:

- Fire Administration
- Asset Management
- Complaints
- Fleet Management
- Hydrant Maintenance
- Inventory
- Inspections
- Master Names
- Mobile Field Reporting
- ODBC Data Dictionary Files (DDF's)
- Permits
- Personnel
- Pre-plans
- Training

6. CAD and Police / Fire RMS Annual Maintenance

Annual Maintenance for CentralSquare's Computer-Aided Dispatch (CAD), police records management system (RMS), fire RMS, and associated interfaces is paid for by NSR911. This includes all CAD/RMS modules currently supported by NSR911.

7. Mobile Data Terminals (MDTs)

Each member community uses MDTs to run IMC Mobile. This allows users to see active calls, call comments, site file information, and even run NCIC queries (authorized users only).

8. Mapping and GIS

Mapping is achieved through CentralSquare's IMC product. While the mapping is based on Google maps, the center can add GIS layers, when appropriate. For example, a layer has been created for established medical landing zones in member communities. NSR911 also has a close working relationship with local municipal assessors and MassGIS to ensure its 911 system is utilizing the most accurate map data on its 911 system.

9. Radio Consoles and System

The legacy radio systems, VHF and UHF, which NSR911 uses to communicate with the public safety agencies they dispatch, are integrated into state-of-the-art Motorola MCC7500 consoles. The center is connected to the Commonwealth of Massachusetts Interoperable Radio System (CoMIRS), also known as the "Core." The connectivity provides access to additional state radio systems (i.e., LPS or EVENT channels). It also provides business continuity/disaster recovery (BC/DR) options allowing NSR911 to maintain radio communications from other core connected sites.

10. Radio System Infrastructure

NSR911 maintains a robust radio network. The center maintains primary and backup radios for each member agency frequency monitored. Going forward, the center is pursuing system-level radio connectivity to each department's radio system as the primary connection and an on-site radio will provide backup capabilities. Where applicable, system-level connectivity includes direct and diverse, connections to each radio component (i.e., repeaters, receivers, comparators, etc.)

11. Fire Station Alerting

A Zetron Internet Protocol Fire Station Alerting system (IPFSA) is in place at NSR911 and member fire departments. As of Winter 2021, NSR911 has installed the IPFSA system at each member department and is working on connecting this system to the IMC CAD system. The required interfaces for IMC and Zetron are already in place. Once connected, the IPFSA will provide audible and visual alerts at each station for fire/EMS calls

12. Fire Alarm Systems

NSR911 monitors fire alarms for the Towns of Middleton and Wenham via a SigCom system. The center's advisory boards have voted not to take on additional municipal fire alarm systems. This service would not be offered to other municipalities (see current Intermunicipal Agreement and list of Core Services).

13. Logging Recorder

Dual/Redundant logging recorders are maintained at NSR911. Each is synchronized with the center's Net Clock to ensure accurate timestamps. Additionally, the center records all 911 calls in addition to NSR911 specific radio frequencies.

14. Emergency Notification System

SwiftReach Emergency Notification System (ENS) is available to member communities at no cost. This system allows for alerts/messages to be sent via text, phone call, email, or even posted on social media platforms. If utilized, a member community would be responsible for appointing a system administrator and users to maintain its system.

15. NSR911 Server Infrastructure

NSR911 manages a robust server system that included IMC's Computer Aided Dispatch (CAD) and Law/Fire Records Management System (RMS). Each member agency connects to the center via secure virtual private networks (VPNs). Data is backed up on a regular basis.

A review of the existing server infrastructure indicated that NSR911 has sufficient server and storage capacity for future expansion.

16. Remote Agency Access

Remote Agency Access is achieved through two (2) separate licenses. One is through an Azure Active Directory License, and the other is via Windows Remote Desktop Server Client Access Licenses. This is procured on an as-needed basis; NSR911 would need to purchase additional licenses to onboard another department/community.

3. TECHNOLOGY ANALYSIS

An assessment of technological capabilities and the associated cost estimates are critical components of integrating Manchester PSAP into NSR911. This section provides cost estimates and analyses of the various integration components.

3.1 911 Network and Answering Equipment

The Commonwealth of Massachusetts provides all 911 CPE and call-taking hardware and software for every PSAP in the state. It utilizes a Next Generation 911 (NG911) system that uses multiple servers traveling over diverse routes. Migrating Manchester's calls to NSR911 would require a minimal effort from State 911 and Comtech. The process would be accomplished through a Modify/Add/Change or MAC request, and it would be coordinated by State 911 and Comtech. **All costs resulting from the MAC would be incurred by State 911.**

3.2 Administrative Telephone Equipment

Integrating Manchester's telephone system with NSR911's could be accomplished in at least two different ways. Manchester could implement its own auto-attendant system and provide options to forward the call into NSR911's system or NSR911 could create a system on its end, migrate (port) Manchester's telephone numbers to NSR911, build an auto-attendant, and provide options to transfer calls back to Manchester.

Considerations if Manchester keeps its existing system:

- Manchester will need to add auto-attendant features to its police and fire administrative lines
- Manchester will need to forward specific lines/calls to NSR911
    - NSR911 will need to procure at least two (2) Direct Inward Dial (DID) telephone lines[7] (one for police and one for fire).
- Manchester's system could be configured to allow internal transfers within its network.
- Maintaining and updating the town's auto-attendant could be completed by authorized Manchester users.
- **Cost estimate would be less than $100 per month for NSR911. Costs to add an auto-attendant onto Manchester's system are unknown but would likely be less than $100 per month.**

Considerations if NSR911 creates a system for Manchester:

- Each telephone number associated with Manchester's current system would need to be ported to NSR911.
    - Manchester would not be able to make outbound calls on these lines or directly receive inbound calls (i.e., all calls would go through NSR911's VoIP system)
    - Manchester would need to procure additional telephone lines for calls for daily use at the PD/FD.

[7] NSR911's existing administrative VoIP system allows multiple concurrent calls to occur with minimal telephone numbers.

- **Cost estimate would be less than $150 per month for NSR911. Costs to add approximately six (6) telephone lines at Manchester would likely run $50 per line X 6 = $300 per month.**

3.3 Computer-Aided Dispatch

It is recommended that both the police department and the fire department migrate to NSR911's CAD/RMS system. NSR911 would work with Manchester to convert its existing data from Microsystems and Firehouse to NSR911's system. It would also work with Manchester's system administrator to ensure code tables have similar entries.

NSR911 would work with various municipal officials to ensure that streets, address ranges, intersections, and other points match the data on file with the Town's assessor and Mass GIS offices.

NSR911 may need to purchase two (2) CAD Query and Reporting licenses. The cost estimate is approximately $1,100.

3.4 Records Management System (Police and Fire)

NSR911 would need to procure RMS licenses for Manchester Police and Fire Departments to utilize its records management system (RMS), along with associated interfaces for each system.

Bar Coding, Cross Agency, Detective, Fingerprint, Fire Records, Gang Modules, Imaging/Photo Lineup, Records, Forms, Mapping, Message Server, NCIC, and Pervasive modules would need to be purchased. Approximate cost is $45,000.

3.5 IMC Administration System

NSR911 would need to procure licenses for the Administration Police and Fire modules. This is a service provided to all member departments. As such, these modules would need to be procured for Manchester.

It is estimated that these modules would cost approximately $7,500.

3.6 IMC Mobile System

Based on Manchester's survey, it was determined that most police and ambulance vehicles have Mobile Data Terminals. NSR911 would recommend dedicated MDTs for each Police, Fire, and EMS vehicle with connectivity to IMC's mobile system.

It is estimated this these modules would cost approximately $26,000 to outfit Manchester's police, fire, and EMS fleet with mobile software.

3.7 IMC Training Courses

Since Manchester uses a different CAD/RMS system than NSR911, all police and fire employees would need to go through various levels of training. All police/fire employees would need to undergo approximately 12 hours (1.5 days) of classroom training. In addition to this, police

system administrators should plan on an additional 2-3 weeks of training. Fire system administrators should plan on an additional 1-2 weeks of training. NSR911 also would anticipate making trainers available for agency "Go-Live" and subsequent refresher courses.

It is estimated that the cost of associated training courses would be approximately $50,000[8].

3.8 Data Conversion

Manchester currently uses one software for CAD and police RMS; it uses a different program for fire RMS records. NSR911 would recommend converting this legacy data into the IMC CAD and RMS systems. This is a very time-consuming process and requires a strong commitment from police and fire system administrators. Based on the current environment, NSR911 anticipates that it would likely take a vendor 12+ months to convert this data. System administrators should plan on spending approximately 80+/- hours over several months reviewing converted data.

It is estimated that data conversion may cost approximately $50,000 to convert Manchester's CAD, Law RMS, and Fire RMS systems.

3.9 CAD and Law/Fire RMS Annual Maintenance

As part of its core offering, NSR911 covers the costs associated with CAD and Law/Fire RMS Annual Maintenance.

Based on existing contracts, NSR911 estimates that it would cost approximately $25,000 per year to cover Manchester's associated costs, including the modules and/or interfaces notated in this section.

3.10 Mobile Data Terminals (MDTs)

NSR911 provides each police, fire, and EMS frontline vehicle with a state-of-the-art MDT. The following would be offered to Manchester. Based on interviews with municipal officials, this would include 7 police vehicles, 7 fire vehicles, and 2 EMS vehicles.

Manchester units would benefit from the data communications capabilities the client offers. Apart from the DCJIS capability, the IMC mobile system provides car-to-car messaging, an embedded mapping client, AVL capability, and silent emergency button capabilities. It would also allow CAD events to be transmitted directly to the mobile data client and then imported into the CAD and/or RMS for the completion of reports.

NSR911 estimates that it would cost approximately $7,500 per MDT (including mounts and installation) for a total of $120,000 to outfit the Manchester Police and Fire Departments with MDTs.

[8] Costs identified in this section are for courses/instructor costs only. This does not include salary costs that would be Manchester's responsibility.

NSR911 would also need to procure 16 mobile air cards to establish data connectivity with its server infrastructure. **This currently costs approximately $40 per month per connection. Based on 16 connections X $40 it is estimated that this would cost $640 per month or $7,680 per year.**

3.11 Mapping/GIS

Adding GIS layers into the IMC mapping system can be accomplished without incurring any additional costs to NSR911 or Manchester. This mapping provides multiple layers of data for the region in which the NSR911 serves. **There would be no cost to NSR911 to add mapping/GIS features.**

3.12 Radio System

The following sections discuss the radio integration of Manchester's Police and Fire Departments into NSR911.

3.12.1 Radio Consoles/Infrastructure at NSR911

Dispatch services for the Manchester Police and Fire Departments from NSR911 should be achieved through two methods. The primary method would be system-level connectivity with the existing repeaters. This method is further identified in §3.12.2. The secondary, or backup, method would be through the use of control stations operating on the inbound frequency to the main repeater. Two new control stations should be deployed in the NSR911 radio shelter where they could be integrated into the Motorola MCC7500 radio console system. Transmission lines could also be installed between the NSR911 radio shelter and the tower where antennas could be mounted directing the signal to the existing Manchester repeaters. This method is currently in use for the localities already consolidated within the NSR911. **It is estimated that it would cost approximately $25,000 for radios, installation, and programming at NSR911.**

As part of the radio infrastructure, NSR911 is able to use existing VHF/UHF antennas on the tower. To achieve this, NSR911 would need to install two (2) control station combiners (VHF & UHF) along with appropriate jumper cables as part of the above installation. This would alleviate any potential intermodulation concerns. **It is estimated that this would cost $50,000.**

A review of the available Conventional Channel Gateway (CCGW) resources at NSR911 indicates that there are approximately four (4) available spots for radio resources[9]. This would be able to accommodate one primary and one back radio for both Manchester Police and Fire. However, NSR911 would need to purchase another high-density CCGW to monitor other frequencies, like Marine 9. Additionally, it would be beneficial for the radios to be installed on Harbormaster boats (if not already equipped) with Manchester PD's local frequency. This would allow the harbormaster to communicate directly with NSR911 on the town's robust radio system. **The cost estimate for this would be approximately $25,000.**

[9] If NSR911 monitors Marine 9, this item would be mandatory.

Once additional resources are added onto the NSR911's network, they will need to be added to the existing radio services and preventative maintenance agreement. **NSR911 estimates that this would cost approximately $15,000 per year.**

3.12.2 Radio Network – Manchester Police and Fire Departments

The police and fire departments each independently operate their own UHF system. Municipal officials noted that each radio systems operate from the same locations. Further, each system is comprised of one (1) main repeater, one (1) backup repeater, five (5) receivers, and one (1) comparator (voter). All sites are connected via municipal fiber except for two locations.

As part of a migration, NSR911 would pursue system-level connectivity to the Manchester system to ensure diverse connections are established. **It is estimated that five (5) connections would need to be created. This would cost approximately $500 per month per connection for a total monthly estimated cost of $2,500 ($30,000/year).**

As part of the system-level connectivity project, switches and routers would need to be procured in addition to setting up and programming the backhaul connectivity. **NSR911 estimates that this would be a one-time cost of $20,000.**

During interviews with town officials, it was indicated that the Magnolia section of town lacked sufficient radio coverage. NSR911 should consider performing a real-world coverage test to identify gaps, and based upon testing, look at potentially adding another receiver site (radio, antenna, cable, etc.). **NSR911 estimates that this would be a one-time cost of $15,000**

3.12.3 Radio Licensing

As part of the onboarding process, NSR911 would need to secure licenses to broadcast on applicable Manchester radio frequencies. A consultant should be hired to fill out the appropriate application forms (i.e., FCC Form 601), produce required letters of concurrence (if needed), and any other documentation as may be required to appropriately license NSR911 to operate on Manchester's radio frequencies. **It is estimated that this would cost approximately $4,000.**

3.12.4 Radio Power (UPS/Generator)

Due to deficiencies noted at radio sites, at least two (2) UPS systems and one generator should be procured to maintain sufficient radio coverage. **It is estimated that this would cost approximately $10,000.**

3.13 Fire Station Alerting

NSR911 would need to procure a Zetron Fire Station Alerting system for Manchester. It was noted that Manchester currently utilizes an antiquated and homegrown system. The proposed system would be NFPA 1221 compliant and would allow integration with NSR911's existing IPFSA system. **NSR911 estimates that this would cost between $70,000 and $90,000.**

3.14 Logging Recorder

The State 911 Department provides a dual-redundant logging recorder to NSR911. The center would likely need to add four (4) radio channels onto the recorder. A MAC would need to be submitted; however, **this would not incur any additional costs to NSR911**.

3.15 Emergency Notification System

Manchester indicated that it is not interested in migrating to NSR911's ENS system. **There are no NSR911 costs associated with this.**

3.16 NSR911 Server Infrastructure

As discussed in § 2.3.1 Technology, NSR911 does not need to purchase any additional server infrastructure to onboard the Town of Manchester. **There would be no need (cost) to expand NSR911s existing server infrastructure.**

3.17 Remote Agency Access

As discussed in § 2.3.1 Technology, NSR911 would need to purchase Windows Remote Desktop Server licenses in addition to Azure Active Director licenses. Both of these would be required on a 1:1 basis. The Town of Manchester indicated that it has 25 police officers and 18 firefighters. **The Windows Remote Desktop Server license costs ~$90/ea and is a non-recurring charge (NRC) totaling $3,870. Azure Active Directory is an annual recurring cost (ARC) at ~$15/ea for a total ARC of $645.**

3.18 Station Security

Representatives from both the police and fire department expressed an interest to have their station monitored by NSR911. This would require a camera, recording equipment, intercom telephone, and VoIP telephone license. **NSR911 estimates that it would cost approximately $15,000 in one-time charges and $1,500 in recurring charges to complete this.**

3.19 Internet Connectivity

While the primary connection between Manchester and NSR911 would be achieved through the town's existing ISP. A separate connection should be established along with a router capable of handling multiple ISPs. **NSR911 estimates that it would cost approximately $1,500 in one-time charges and $480 in recurring charges to complete this.**

3.20 Technology Integration Cost Summary

The following table represents changes required from each area of technology and to integrate dispatch of the Town of Manchester public safety agencies into the NSR911.

Table 7 – Manchester Technology Integration Cost Estimate Summary

Section	Estimated ARC[10]	Estimated NRC[11]
3.1 – **911 Network and Answering Equipment**	**State Cost**	

[10] ARC is Annual Recurring Charge
[11] NRC is Non-Recurring Charge (i.e., One-time charge)

3.2 – **Administrative Telephone Equipment**[12]	**$1,200**	**$0**
3.3 – **Computer-Aided Dispatch Licenses**	**$0**	**$1,100**
3.4 – **Records Management System (Police and Fire)**	**$0**	**$45,000**
3.5 – **IMC Administration System**	**$0**	**$7,500**
3.6 – **IMC Mobile System**	**$0**	**$26,000**
3.7 – **IMC Training Courses**		**$50,000**
3.8 – **Data Conversion**	**$0**	**$50,000**
3.9 – **CAD and Law/Fire RMS Annual Maintenance**	**$25,000**	**$0**
3.10 – **Mobile Data Terminals (MDTs)**	**$7,680**	**$120,000**
3.11 – **Mapping/GIS**	**$0**	**$0**
3.12 – **Radio System**	**$45,000**	**$149,000**
3.13 – **Fire Station Alerting**		**$90,000**
3.14 – **Logging Recorder**	**State Cost**	
3.15 – **Emergency Notification System**	**$0**	**$0**
3.16 – **NSR911 Server Infrastructure**	**$0**	**$0**
3.17 – **Remote Agency Access**	**$645**	**$3,870**
3.18 – **Station Security**	**$1,500**	**$15,000**
3.19 – **Internet Connectivity**	**$480**	**$1,500**
Total Cost Estimates	**$81,505**	**$558,970**

4. STAFFING ANALYSIS

3.1 Town of Manchester Workload

Under routine operations, the Manchester PSAP is staffed by one telecommunicator. However, during storms and critical incidents the department up staff to two telecommunicators. The total workload of these personnel is determined by the following.

- 911 Calls
- Administrative Telephone Calls
- Dispatch positions
- Ancillary Duties

3.1.1 911 Volume and Dispatch Responsibilities

The impacts of integrating the additional Manchester call volume and dispatch responsibilities are discussed in subsequent sections.

[12] Assumes Manchester utilizes its existing system

3.1.2 Ancillary Duties

NSR911 has created a proposed list of its core services. This is available in APPENDIX A of this document. It outlines the standard ancillary duties which would be performed NSR911. This would include lobby interactions, utility notifications, tow notifications, and processing of business telephone calls through an auto-attendant telephone system.

3.2 NSR911 Staffing Impact

3.2.1 Dispatcher Staffing

Due to the COVID-19 pandemic, most agencies saw a significant decrease in call volume. Because of this, we used a 3-year average in our review for the full calendar years 2018-2020.

The Manchester PSAP received a yearly average of 1,150- 911 calls, 13,238- administrative telephone calls, and 15,350- CAD Calls for Service. The Manchester Police Department records approximately 9,511 police incidents, 27.67 arrests, and 142.67 accidents per year. This averages out to nineteen (19) police incidents per day, <1 arrest per day, and <1 accident per day. The Manchester Fire Department recorded an annual average of 515 fire incidents, 455 EMS incidents, and 367 fire inspections. This worked out to about 1.4 fire incidents per day, 1.2 EMS calls per day, and about 1 fire inspection per day.

During 2020, NSR911 reported a total of 27,585 calls on its 911 system (9,694- 911 calls and 17,891- 2Way Emergency Calls). There were 66,992 law incidents and 8,076 fire incidents for a total of 75,068 calls for service. As previously discussed, there are currently four (4) telecommunicators working per shift from 8AM until 12AM and three (3) telecommunicators from 12AM until 8AM. There is always at least one (1) supervisor on duty per shift.

3.2.2 Staffing Summary

After thoroughly reviewing the average volume of 911 calls, administrative calls, and police/fire activity, NSR911 has determined that there is no need to hire additional staff. In making this determination, we utilized APCO's Project RETAINS staffing tool and the Erlang-C calculator based on reported call volume and CAD entries. NSR911 applied industry standards and best practices when conducting these calculations. NSR911 also applied our subject matter expertise through consideration of current NSR911 capacity for expansion in staff training, automated systems improvements/expansion, and understanding that the implementation of an auto-attendant for the Town of Manchester will process non-emergency and administrative calls, thus reducing the anticipated call volume impact.

Using the APCO Project RETAINS and Erlang-C calculators, it was determined that NSR911 should have a total staffing complement of 44.2 full-time equivalents or FTEs. Of the 44.2 FTEs, it should be broken out in the following manner: telecommunicator (31.2), supervisor (8.9), and administrative staffing (4.0). **NSR911 is currently authorized for 44 FTEs; it should work towards filling all authorized FTE positions.**

As indicated previously, industry staffing guidelines indicate that a minimum of five people is necessary to staff one position around the clock. Unlike call-taking volume that fluctuates, the dispatch positions require a dedicated staff member around the clock regardless of workload volume.

3.2.3 Call Taking and Dispatch Methodology

Traditionally, telecommunicators in smaller PSAPs often function as a combined call taker and dispatcher simultaneously. In other words, the incoming call is received and processed, and field units are sent, by the same telecommunicator. Most often, this methodology works well in this environment. Splitting of functions represents significant changes from the traditional one-person-does-it-all approach but does provide benefits that cannot be achieved when a single telecommunicator performs both functions.

A true call taker and dispatcher system allows call-takers to be online with the caller, obtaining vital information for responders, while the dispatcher sends units simultaneously. 911 callers are queried to determine the incident type (nature), the incident location, vital information, and the calling party name and call back phone number. The call information is then sent via CAD to the appropriate dispatcher(s) for radio dispatch of field units. For example, CAD will generate two incidents, one police and one fire for a call that requires both police and fire response ensuring that both response agencies are notified at the same time. When the call-taker remains online with the caller (when necessary), further information important to the response and mitigation of the incident can be gathered, entered into CAD, viewed by the dispatcher(s), and relayed to the field units. This model will provide the best possible service to callers by potentially reducing the overall response time through a faster dispatch time. This methodology also allows the call taker and dispatcher to both focus on obtaining necessary information and dispatching units without having to manage an upset caller, field personnel, and potentially additional incoming calls. The key to achieving maximum efficiency in call taking and dispatch is standardized call-taking protocols and effective use of the CAD system so that communications between call-taker and dispatchers are seamless.

In scenarios where a caller is in danger, best practices dictate that the call taker stays on the line with the caller until help arrives. The call taker provides updates for the dispatcher(s) and responders throughout the call via the CAD system. Situations, where a caller may remain on the line, may include in-progress/just occurred events and suicidal or homicidal persons. In these instances, the responders are already dispatched and are kept apprised of the updated information by the dispatcher(s). The unit's/apparatus' initial dispatch response, overall, will be potentially reduced by having the call available for dispatch simultaneously for all appropriate responders.

Taking this concept one step further, the dispatcher's role is generally split between fire, EMS, if appropriate, and law enforcement. This structure ensures that police, fire, and 911 callers all receive the same high-quality service from the PSAP.

In addition to allowing telecommunicators to better focus on only call taking or dispatching, splitting the functions helps the PSAP achieve the following industry standards for call taking:

- **NENA-STA-020.1-2020** & **NFPA 1221 (2019 Edition) §7.4.1**, 911 Call Answering Standards, state that ninety percent (90%) of all 911 calls arriving at the Public Safety Answering Point (PSAP) shall be answered within fifteen (15) seconds and ninety-five (95) percent of all 911 calls should be answered within twenty (20) seconds.
- **NFPA 1221 (2019 Edition), Chapter 7 Annex A.7.3.1** states "…Consider the following two concepts of communications center operations:

    1. Vertical Center. A telecommunicator performs both the call taking and dispatching functions
    2. Horizontal Center. Different telecommunicators perform the call-taking and dispatch functions.

    Telecommunicators working in a vertical center are known to engage in multitasking that can inhibit their ability to perform assigned job functions.

These standards can be difficult to meet when a single employee must juggle multiple job functions simultaneously.

As a center of excellence, NSR911 has adopted numerous key performance indicators (KPIs) for administrative, operations, and quality assurance. More information on NSR911's KPIs can be found at www.ecrecc.org/statistics by clicking on the "Key Performance Indicators" document.

3.3 Training

The NSR911 initial training requirements for their telecommunication staff include:

- 16-Hour 911 Equipment (CPE) training
- 40-hour APCO Basic Public Safety Telecommunicator Training
- 32-Hour APCO Emergency Medical Dispatch Training
- 8- Hour Cardio-pulmonary resuscitation (CPR)
- 32-Hour APCO Fire Communications
- FEMA - IS 100 Introduction to the Incident Command System
- FEMA - IS 200 Basic Incident Command System
- FEMA - IS 700 National Incident Management System
- FEMA - IS 800 National Response Framework, An Introduction
- CJIS Training & Testing
- Seabrook Nuclear Training
- State Ethics Online Training for State Employees
- National Center for Missing & Exploited Children

Other specific training that needs to occur prior to cutover needs to include:

- Identification and standardization of common protocols for Town of Manchester agencies by agency heads.

- ❖ Adjustments and acclimation to unique requirements for call taking and dispatching of Manchester emergency responders.
- ❖ Updated radio console and CAD system training that covers the changes implemented in these systems to accommodate the Town of Manchester
- ❖ Town of Manchester specific nuances and geography

4. SPATIAL ANALYSIS

NSR911 evaluated the number of consoles within its building and identified that no additional console furniture would be required if Manchester were to join the center.

5. TRANSITIONAL COST ANALYSIS

NSR911 analyzed the cost to transition the Town of Manchester's PSAP and police/fire emergency communications into NSR911. The following information provides an overview of technology and staffing costs, should the Town of Manchester move forward with the transition to NSR911.

5.1 Technology Costs

In Section 3 NSR911 identified the technology changes required to successfully transition Manchester to NSR911. For ease of reference, the following table is a duplicate of Table 7 from Section 3.20 and represents technology integration costs related to the transition. This information is provided as a high-level estimate and does not include all direct or indirect costs associated with consolidating a PSAP; however, it does identify the significant costs which must be addressed for NSR911 to provide dispatch services for Manchester.

Table 8 – Manchester Technology Integration Cost Estimate Summary

Section	Estimated ARC[13]	Estimated NRC[14]
3.1 – **911 Network and Answering Equipment**	**State Cost**	
3.2 – **Administrative Telephone Equipment**[15]	**$1,200**	**$0**
3.3 – **Computer-Aided Dispatch Licenses**	**$0**	**$1,100**
3.4 – **Records Management System (Police and Fire)**	**$0**	**$45,000**
3.5 – **IMC Administration System**	**$0**	**$7,500**
3.6 – **IMC Mobile System**	**$0**	**$26,000**
3.7 – **IMC Training Courses**		**$50,000**
3.8 – **Data Conversion**	**$0**	**$50,000**
3.9 – **CAD and Law/Fire RMS Annual Maintenance**	**$25,000**	**$0**

[13] ARC is Annual Recurring Charge
[14] NRC is Non-Recurring Charge (i.e., One-time charge)
[15] Assumes Manchester utilizes its existing system

3.10 – **Mobile Data Terminals (MDTs)**	**$7,680**	**$120,000**
3.11 – **Mapping/GIS**	**$0**	**$0**
3.12 – **Radio System**	**$45,000**	**$149,000**
3.13 – **Fire Station Alerting**		**$90,000**
3.14 – **Logging Recorder**	**State Cost**	
3.15 – **Emergency Notification System**	**$0**	**$0**
3.16 – **NSR911 Server Infrastructure**	**$0**	**$0**
3.17 – **Remote Agency Access**	**$645**	**$3,870**
3.18 – **Station Security**	**$1,500**	**$15,000**
3.19 – **Internet Connectivity**	**$480**	**$1,500**
Total Cost Estimates	**$81,505**	**$558,970**

5.2 Staffing Costs

As noted in section 4, NSR911 would be able to onboard Manchester without having to increase its authorized Full Time Equivalent (FTE) positions. The center is currently authorized for 44 FTEs; **it should work towards filling all vacant FTE positions.**

5.3 Total NSR911 Estimated Integration Costs

The following table summarizes annual recurring charges (ARC) and non-recurring charges (NRC) for integrating the Town of Manchester into NSR911. These are charges that would be paid for by NSR911 with no cost required for Manchester for onboarding.

Table 9 - Total NSR911 Estimated Integration Costs

Table 8 – Total NSR911 Estimated Integration Costs		
Category	Estimated ARC	**Estimated NRC**
Technology Costs (Table 8)	$81,505	$543,970
Additional Personnel Costs (See §4)	$0	$0
Total Estimates	**$81,505**	**$543,970**

6. APPENDIX A

6.1 PROPOSED CORE SERVICES

This section contains a listing of proposed core services that NSR911 would offer to the Town of Manchester:

1. 911 Public Safety Answering Point (PSAP):
    - Answer Emergency 911 calls
    - Answer business lines on an emergency basis
    - Monitor Member shared radio frequencies
    - Monitor Mutual Aid Radio frequencies (BAPERN, CMED, MEMA, Fire District Control Point for situational awareness purposes)
    - Dispatch Police Fire and Ambulance resources for member communities including mutual aid and dispatch
    - Emergency notifications to utility companies, DPW, animal control, etc.
2. CJIS/Criminal record inquiries/ Arrest packets for **active calls for service**
3. Incident involvements for active incidents **IF** CAD allows backfill
4. Detail requests - forwarding name/number to single POC
5. Enter calls for service entries
6. Entering NCIC Warrants, Missing Persons, etc.
7. CAD Administrator
8. CAD Statistics
9. Automatic text/email Fire pages
10. Notifying DPW after hours - Single POC
11. Notifying ACO 24/7-one notification (page/call)
12. Requesting Tow Company
13. Monitor IAMRESPONDING
14. Lobby Interactions
15. Emergency Notifications Systems