Commonwealth of Massachusetts
State 911 Department
North Shore Regional 911 Center

Ipswich

FEASIBILITY REPORT TO ONBOARD
THE TOWN INTO THE NSR911
Prepared: April 1, 2021

www.ecrecc.org

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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 Ipswich (Ipswich), 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 Ipswich's emergency communications operation into NSR911. The evaluation includes migrating the Town of Ipswich's Police and Fire departments' 911 communications and dispatch. Operation and system evaluation surveys were distributed to stakeholders in Ipswich 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 Ipswich emergency communications operations into NSR911. When possible, and applicable, cost estimates necessary to complete the onboarding process were noted.

It is NSR911's opinion that Ipswich would benefit from added technology and capabilities by joining NSR911. While Ipswich uses the same Computer-Aided Dispatch (CAD) and Records Management Systems (RMS) by its police and fire departments, NSR911 can provide access to additional modules not currently used by Ipswich. Member communities and Ipswich would also benefit from having greater situational awareness and crime analytic tools. Should the Town of Ipswich 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 in the Town of Ipswich can increase its existing mobile data network and law enforcement/fire RMS through additional licenses procured by NSR911. This is a significant savings to the Town of Ipswich in not having to procure these costly systems independently and maintain them for years to come.

1. PROJECT OVERVIEW

1.1 Background

As a result of discussions between the Town of Ipswich and North Shore Regional 911 Center (NSR911), the Town of Ipswich 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 Ipswich from technological, staffing, spatial, and fiscal perspectives. NSR911 is conducting this assessment after receiving a Letter of Intent and subsequent data from the Town of Ipswich. 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 Ipswich'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

Inventory and assess the PSAP technology currently in place in the Town of Ipswich 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 Ipswich call volume and dispatch responsibilities, NSR911 assessed existing staffing and, utilizing industry-approved calculators, determined whether increased staffing would be necessary. Staffing a full-time equivalent to cover Ipswich'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 Ipswich dispatch personnel that would need to be addressed with a move to the NSR911 were also identified.

4. **Spatial Needs**

NSR911 conducted an assessment of its facility's capacity to incorporate Ipswich'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 Ipswich's emergency communications is a success, but also those recurring costs that NSR911 will incur annually by having Ipswich 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 Ipswich.
- ❖ Interviews with Ipswich 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 Ipswich PSAP staff and reported in their survey included handing walk-up window interactions, monitoring prison cells, answering calls for the municipality during off-hours, and property returns.
  - o NSR911 would offer the following services:
    - ▪ Lobby interactions via camera/telephone
    - ▪ Answering business line calls provided they are routed through an auto-attendant
  - o NSR911 would not provide the following services:
    - ▪ Monitoring prison cells
    - ▪ Property returns
- ❖ NSR911 will not assume the maintenance and/or monitoring of Ipswich's municipal fire alarm system.
- ❖ CAD, RMS, 911, and administrative call volumes were reviewed for calendar years 2017, 2018, and 2019. During 2020, as the world dealt with COVID-19, most call centers experienced significant decreases in call volume. For this reason, NSR911 chose not to review 2020 data in consideration of this feasibility study.

❖ Other than estimating personnel increases at NSR911 and comparing salary/benefit structure between the two communications centers, no assumptions concerning Ipswich personnel were made.

2. CURRENT ENVIRONMENT

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

2.1 Town of Ipswich

The Town of Ipswich is located 28 miles north-northeast of Boston, within Essex County, and lies along the Ipswich River. It is 33.3 square miles in size. Within the community, there are two elementary schools, one middle school, and one high school. Based on the population divided by the square mileage, there is a population density of 395 residents per square mile.

Table 1 - Ipswich Demographics

Ipswich Demographics	
2010 Population (US Census)	13,175
Square Mileage of Community	33.3
Population Density (Population/Sq Mi)	395

The 2010 population based on the US Census Bureau was 13,175. This has increased to 14,074 based on the 2019 US Census estimate. The Town maintains a primary PSAP at the Police Department (PD). The primary PD PSAP answers all 911 and 10-digit wireline calls, and Wireless Phase 2 (WPH2) calls for the Town of Ipswich. Additionally, as of April 19, 2021, the town began taking Wireless Phase 1 (WPH1) calls.

All non-medical and motor vehicle accident (MVA) calls are processed and dispatched in-house. Medical calls, are dispatched internally and transferred to Action Ambulance for Emergency Medical Dispatching and Emergency Medical Services (EMS).

2.1.1   Police Department (Primary PSAP)

In 2019, the Ipswich PD primary PSAP received an estimated 2,211 911 calls and 37,558 administrative telephone calls which resulted in 25,350 calls for service. The center also handles approximately, 2,341 walk-ins at the station per year. Based on the figures provided by the police department the PSAP is handling an average of 103 administrative calls, 6- 911 calls, 69 calls for service, and about 6.5 walk-in visits per day.

Table 2 - 2019 Ipswich PSAP Call Volume Summary

2019 Ipswich PSAP Call Volume Summary		
Type of Call Type	Annual # of Calls	Daily Average # of Calls
911 Calls	2,211	6
Business Line Calls	37,558	103

CAD Calls for Service	25,350	69
Station Walk-Ins	2,341	6.5
Total Annual Calls/Contacts	313,317	~185

The police department also reports approximately 2,500 – 3,330 reportable police incidents, 250 – 350 arrests, and 150 – 250 accidents per year. On a daily average, this equals about 7 – 9 reportable incidents, <1 arrest, and <1 accident per day.

Table 3 - 2019 Ipswich Police Incident Volume Summary

2019 Ipswich Police Incident Volume Summary		
Type of Call Type	Annual Volume	Average Daily Volume
Police Incidents	3,330	7-9
Arrests Incidents	250-300	<1
Motor Vehicle Accidents Incidents	150-250	<1
Total Annual Incidents	~3,800	~10

The Town of Ipswich contracts a certified EMD resource, Action Ambulance, to perform all Emergency Medical Dispatch. However, all telecommunicators are EMD certified by Priority Dispatch.

The Police Department employs four- full-time, one- part-time, and three- per diem dispatchers (telecommunicator). 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 equipped for both radio and call-taking functions. Dispatchers monitor radios for the town's Department of Public Works (DPW), Animal Control Officer (ACO), Harbormaster, Electric Light Department (ELD), Emergency Management (EM), and Shellfish Constable.

Twenty-five (25) full-time and fifteen (15) part-time / per diem officers cover the community. Staffing typically ranges from four (4) to six (6) officers working per shift.

2.1.1.1 Technology
The following technology is currently in place in the Ipswich PSAP:

1.   911 Answering Equipment or Customer Premise Equipment
The Commonwealth of Massachusetts provides all 911 telephony equipment for the primary Ipswich PSAP, also known as customer premise equipment (CPE).

2.   Administrative Telephone Equipment
The Police Department and PSAP are supported by an Avaya Office Manager IP 500 administrative phone system which was installed in 2017. The Police Department does not currently use an auto-attendant on this phone system.

3.   Computer-Aided Dispatch

The PSAP operates CentralSquare's IMC Computer-Aided Dispatch (CAD) and law enforcement records management system. The system was originally installed in 2016 and last updated in 2020.

Ipswich's CAD system currently provides interfaces to the following:
- ❖ Law Enforcement RMS
- ❖ Fire RMS
- ❖ Mobile Data Terminals (MDTs)
- ❖ Fingerprint Interface

4.   Records Management System (RMS)

The Police Department utilizes CentralSquare's IMC Records Management System. The system was originally installed in 2016 and last updated in 2020.

Ipswich utilizes the following modules within its RMS:
- ❖ Accident
- ❖ Arrest
- ❖ Booking
- ❖ Case Management
- ❖ Crime Analysis
- ❖ Employee
- ❖ Internal Affairs
- ❖ Licensing and Permits
- ❖ Master Names
- ❖ Master Vehicle Index
- ❖ Mugshot
- ❖ Parking
- ❖ Property & Evidence
- ❖ Traffic Citation
- ❖ Traffic Warning
- ❖ Training
- ❖ Warrants

RMS is also interfaced with the following:
- ❖ CAD
- ❖ Courts
- ❖ NIBRS
- ❖ eCitation
- ❖ Live Scan

5.   Mobile Data Terminals (MDTs)

The Police Department has twelve (12) vehicles of which six (6) are currently equipped with MDTs while the other six (6) do not have any mobile computers. Vehicles that are equipped with MDTs all have IMC Mobile installed enabling officers to see call data and perform criminal justice queries.

6.   Radio System Infrastructure

The police department operates a duplex UHF radio system. The radio system infrastructure system consists of the main repeater (Motorola GTR8000 – installed 01/2019), a backup repeater (Kenwood NXR800 – installed 10/2014), five (5) receivers (various makes/models – installed between 2012 to 2020), and a comparator (JPS 1000 – installed 01/2010). Of the five (5) sites, two are connected via fiber links, two are connected with RF links, and one is housed at the main comparator site.

It was reported that current radio coverage was adequate, but there was concern about a loss of coverage should the town migrate to narrowband or digital (P25) emissions.

The police department maintains two FCC call signs (1)WIK328, and (2) WQLM452. Both licenses are currently active. However, one of the licenses may need to be modified.

7. Emergency Notification System

The town of Ipswich utilizes RAVE as its Emergency Notification 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.

2.1.2 Fire Department

Between 2017 and 2019, Ipswich FD handled approximately 1,300 incidents, 900 EMS calls, and 550 fire inspections. On a daily average, this equals about 4 reportable incidents, 2.5 EMS calls, and 1.5 fire inspections per day.

Table 4 - 2019 Ipswich Fire Call Volume Summary

2019 Ipswich Fire Call Volume Summary		
Type of Call Type	Annual Volume	Average Daily Volume
Fire Calls	1,300	4
EMS Calls	900	2.5
Fire Inspections	550	1.5
Total Call Volume	2,750	8

The Town of Ipswich contracts with Action Ambulance to provide Emergency Medical (ALS and BLS) ambulance services within the town.

The FD also maintains a fire alarm receiver unit system which consists of nearly 200 locations throughout the City. These units are hardwired meaning no RF or radio signaling is used to transmit alarms.

Dispatchers operating out of the primary PSAP provide call-taking and dispatching for all fire calls. Meanwhile, Emergency Medical Dispatch and ambulance response are handled by Action Ambulance.

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

1. Administrative Telephone Equipment

The Fire Department is supported by an Avaya Office Manager IP 500 administrative phone system which was installed in 2017. The Fire Department does not currently use an auto-attendant on this phone system. Town officials noted that the fire department's system was copper-based and delivered to the fire department via the police department.

2. Records Management System (RMS)

The Fire Department utilizes CentralSquare's IMC Records Management System. The system was originally installed in 2016 and last updated in 2020.

Ipswich utilizes the following modules within its RMS:

- ❖ Asset Management
- ❖ Complaints
- ❖ Fleet Management
- ❖ Hydrant Maintenance
- ❖ Inventory
- ❖ Inspections

- ❖ Master Names
- ❖ Mobile Field Reporting
- ❖ Permits
- ❖ Personnel
- ❖ Pre-plans
- ❖ Training

RMS is also interfaced with the following:

- ❖ CAD

- ❖ Field Reporting

3. Mobile Data Terminals (MDTs)

The Fire Department has ten (10) vehicles, not including a department boat and gator. Four (4) of these vehicles are currently equipped with MDTs while the other six (6) do not have any mobile computers. Vehicles that are equipped with MDTs all have IMC Mobile installed enabling firefighters to see call data and various site file information.

4. Radio System Infrastructure

The fire department operates a duplex VHF radio system. The radio system infrastructure system consists of the main repeater (Motorola GTR8000 – installed 01/2019), a backup repeater (Kenwood TKR-750 – installed 10/2014), five (5) receivers (various makes/models – installed between 2012 to 2020), and a comparator (JPS 1000 – installed 01/2010). Of the five (5) sites, two are connected via fiber links, two are connected with RF links, and one is housed at the main comparator site. It was reported that current radio coverage was adequate for mobile radios but subpar for portable radios.

The fire department maintains one FCC call sign – WPGV920 which is currently active.

Vehicle repeaters are also used by the town. There are two (2) active repeaters and plans to install two (2) additional vehicle repeaters during FY22. These repeaters allow firefighters working on a fireground to communicate with dispatchers at the communications center.

5. Fire Station Alerting

A Fire Station Alerting system (FSA) is used in Ipswich. The town currently uses a Zetron Model 4217B to cover its headquarters and Linebrook stations. The system is just used for alerting department members to calls. It is not integrated with CAD and does not provide any other features.

Ipswich Fire Headquarters maintains a total of five (5) active apparatus, meanwhile the Linebrook Station has one (1) active apparatus.

6. Fire Alarm Box System

The FD operates and maintains a municipal fire alarm system which is connected from their remote locations throughout the City to the FD PSAP fire alarm receiver by way of municipal 100mil circuits. The SigCom/Vision 21 software then transfers these alarms to the FD CAD. The Sigcom/Vision 21 Alarm Receiver transmits only master box alarms to the FD CAD. As noted in §1.4 Assumptions, NSR911 will not assume the maintenance and/or monitoring of Ipswich's municipal fire alarm system.

2.1.3   Municipal Network Topography

1. Internet Service Provider (ISP)

The Town of Ipswich has an Internet Service Provider (ISP) that provides sufficient bandwidth. Additionally, an internal fiber network connects town buildings.

2. Firewall

The municipality utilizes a firewall behind the ISP.

3. Backup Power (UPS / Generator)

The municipality Uninterruptable Power Supplies (UPS) installed at all radio sites and the police/fire stations. Generators power the police/fire station. There is also a generator at the main radio transmitter site.

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

4. Redundant Internet Service Provider (ISP) Connectivity

The municipality relies on a single ISP connection.

2.2 Interest in Consolidation

The Town of Ipswich 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 Ipswich PSAP staff.
- ❖ Potential job loss for eight telecommunicators.
- ❖ Determination of how fire alarms will be monitored and by whom.
- ❖ How would lobby interactions be handled?
- ❖ Familiarity of constituents.
- ❖ Who would perform prisoner watch?

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 Room." The Wireless room staff act as a "Pre-PSAP" and triage calls for over 84 cities and towns north of Boston.

The Regional Operations handled 7,517 911 calls, 23,429 2-Way Emergency Calls, and 17,539 business calls during 2019. The following table summarizes the 2020 call volume handled by NSR911:

Table 5 - 2019 Annual NSR911 Call Volume Summary

2019 NSR911 Call Volume Summary	
Type of Call Type	# of Calls
Regional 911 Calls	7,517
Regional 2Way Calls	23,429
Regional Business Line Calls	17,539
Total Annual Call	48,485

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 Room." 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[1] 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 Ipswich.

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)[2]
  ❖ Statewide Information Sharing System (SWISS)

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

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

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 2020.

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 2020.

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 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)

Member community MDTs 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 a 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. During Spring 2021, NSR911 is working with a vendor to finalize one department's installation. Once completed, NSR911 is seeking to connect the IPFSA system to its IMC CAD system. The required interfaces for IMC and Zetron are already in place. Once connected, not only will the IPFSA will provide audible and visual alerts, but it will enable CAD updates based on unit status. For example, if a unit marks itself responding on the IPFSA system, it will automatically be updated in CAD.

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 capability and the associated cost estimates are a critical component of integrating Ipswich PSAP into NSR911. This section provides cost estimates and analysis 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 Ipswich'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 Ipswich's telephone system with NSR911's could be accomplished in at least two different ways. Ipswich 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) Ipswich's telephone numbers to NSR911, build an auto-attendant, and provide options to transfer calls back to Ipswich.

Considerations if Ipswich keeps its existing system:
- Ipswich will need to add auto-attendant features to its police and fire administrative lines
- Ipswich will need to forward specific lines/calls to NSR911
    - NSR911 will need to procure at least two (2) Direct Inward Dial (DID) telephone lines[3] (one for police and one for fire).
- Ipswich'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 Ipswich users.
- **Cost estimate would be less than $100 per month for NSR911. Costs to add an auto-attendant onto Ipswich's system are unknown, but would likely be less than $100 per month.**

Considerations if NSR911 creates a system for Ipswich:
- Each telephone number associated with Ipswich's current system would need to be ported to NSR911.
    - Ipswich 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)
    - Ipswich would need to procure additional telephone lines for calls for daily use at the PD/FD.

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[3] 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 Ipswich would likely run $50 per line X 6 = $300 per month.**

3.3 Computer-Aided Dispatch

Both the police department and the fire department for Ipswich utilize CentralSquare's IMC CAD system. NSR911 would work with Ipswich to merge its existing data on NSR911's system. It would also work with Ipswich'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 $1,000.

3.4 Records Management System (Police and Fire)

The Ipswich Police and Fire Departments utilize IMC's records management system (RMS). Based on interviews and a survey completed by town officials, it was noted that NSR911 provides some additional modules that Ipswich could benefit from. For example, the Gang Module is included with NSR911's software license.

Bar Coding, Detective, Gang Modules, and Imaging / Photo Lineup modules would need to be purchased. Approximate cost is $10,000.

3.5 IMC Administration System

Ipswich Police and Fire noted that they do not currently use the IMC Administration System. This is a service provided to all member departments. As such, these modules would need to be procured for Ipswich.

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

3.6 IMC Mobile System

Based on Ipswich's survey, it was determined that approximately half of its fleet of police and fire vehicles were outfitted with Mobile Data Terminals, which included connectivity to IMC's mobile system. As part of the onboarding process, NSR911 would seek to ensure all vehicles are outfitted with the required capabilities.

It is estimated this these modules would cost approximately $25,000 to outfit approximately ten (10) additional vehicles in Ipswich's fleet with mobile software.

3.7 Data Conversion

There is a desire by both Ipswich and NSR911 officials to conduct data conversion on Ipswich's legacy IMC CAD and RMS systems. This is a very time-consuming process and is one that NSR911

is currently undertaking with its member communities. 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 40 hours over several months reviewing converted data.

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

3.8 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 $25,000-50,000 per year to cover Ipswich's associated costs, including the additional modules and/or interfaces notated in this section.

3.9 Mobile Data Terminals (MDTs)

Ipswich notated that some police and fire vehicles were outfitted with MDTs. NSR911 is in the process of outfitting every member police and fire vehicle with a new state-of-the-art MDT. The following would be offered to Ipswich. Based on interviews with municipal officials, that would include 12 police vehicles, 10 fire vehicles, and 0 EMS vehicles.

Ipswich 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 $7,000 per MDT (including mounts and installation) for a total of $154,000 to outfit the Ipswich Police and Fire Departments with MDTs.

NSR911 would also need to procure 22 mobile air cards to establish data connectivity with its server infrastructure. **This currently costs approximately $40 per month per connection. Based on 22 connections X $40 it is estimated that this would cost $880 per month or $10,560 per year.**

3.10   Mapping/GIS

Adding GIS layers into the IMC mapping system can be accomplished without incurring any additional costs to NSR911 or Ipswich. 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.**

3.11   Radio

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

3.11.1 Radio Consoles/Infrastructure at NSR911

Dispatch services for the Ipswich Police and Fire Departments from NSR911 can be accomplished through the use of control stations operating on the inbound frequency to the main repeater. Two new control stations could be deployed in the NSR911 radio room where they could be integrated into the Motorola MCC7500 radio console system. Transmission lines could also be installed between the NSR911 radio room and the tower where antennas could be mounted directing the signal to the existing Ipswich repeaters. This method is currently in use for the localities already consolidated within the NSR911. **It is estimated that it would cost approximately $50,000 for radios, antennas, cabling, installation, and programming at NSR911.**

NSR911 should give serious consideration to install two (2) control station combiners (VHF & UHF) along with needed antennas and 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. This would be able to accommodate one primary and one back radio for both Ipswich Police and Fire. However, serious consideration should be given to purchasing and installing an additional high-density CCGW. **The cost estimate for this would be approximately $10,000.**

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.**

3.11.2 Radio Network – Ipswich Police and Fire Departments

The police and fire departments respectively operate a UHF and VHF 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 each site with redundant connections. **It is estimated that ten (10) connections would need to be created. This would cost approximately $500 per month per connection for a total monthly estimated cost of $5,000.**

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

3.11.3 Radio Licensing

As part of the onboarding process, NSR911 would need to secure licenses to broadcast on applicable Ipswich 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 Ipswich's radio frequencies. **It is estimated that this would cost approximately $4,000.**

3.12   Fire Station Alerting

Ipswich currently utilizes the Zetron Fire Station Alerting system. During interviews with town officials, it was determined that the system Ipswich currently uses should be upgraded to allow integration with NSR911's IPFSA system. **NSR911 estimates that this would cost between $70,000 and $90,000.**

3.13   Municipal Fire Alarm System

As discussed in § 2.3.1 Technology, NSR911 would not acquire or monitor Ipswich's municipal fire alarm system. **There would be no cost to NSR911 regarding Ipswich's Fire Alarm System. Ipswich would need to determine the best course of action regarding its fire alarm system.**

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

The existing ENS system utilized by NSR911 and member communities could be adapted to fit Ipswich's needs. At this time, it is unknown if Ipswich seeks to continue using its own system or migrate onto NSR911's system. **Should Ipswich migrate onto NSR911's system, it would likely be accomplished with little to no costs. However, if a "white pages" extraction of phone numbers is required, this could result in a cost of approximately $5,000.**

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 Ipswich. **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 Ipswich indicated that it has 40 police officers and 20 firefighters. **The Windows Remote Desktop Server license costs ~$90/ea and is a non-recurring charge (NRC) totaling $5,400. Azure Active Directory is an annual recurring cost (ARC) at ~$15/ea for a total ARC of $900.**

3.18   Station Security

Representatives from the Ipswich Police Department expressed an interest to have their station monitored by NSR911. This would require a camera, recording equipment, intercom telephone, and VoIP telephone license. The Ipswich Fire Department notated that this would not be necessary at the fire department. **NSR911 estimates that it would cost approximately $8,000 in one-time charges and $1,000 in recurring charges to complete this.**

3.19   Technology Integration Cost Summary

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

Table 6 – Ipswich Technology Integration Cost Estimate Summary

Section	Estimated ARC[4]	Estimated NRC[5]
3.1 – 911 CPE	State Cost	
3.2 – Administrative Telephone Equipment[6]	$1,200	$0
3.3 – CAD Licenses	$0	$1,000
3.4 – RMS Licenses (PD & FD)	$0	$10,000
3.5 – IMC Admin Module	$0	$7,500
3.6 – IMC Mobile System	$0	$25,000
3.7 – Data Conversion	$0	$50,000
3.8 – CAD/RMS Annual Maintenance	$50,000	$0
3.9 – MDTs	$10,560	$154,000
3.10 – Mapping / GIS	$0	$0
3.11.1 – Radio Consoles /Infrastructure at NSR911	$15,000	$110,000
3.11.2 – Radio Network	$5,000	$20,000
3.11.3 – Radio Licensing		$4,000
3.12 – Fire Station Alerting		$90,000
3.13 – Municipal Fire Alarm System	$0	$0
3.14 – Logging Recorder	State Cost	
3.15 – Emergency Notification System		$5,000

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[4] ARC is Annual Recurring Charge
[5] NRC is Non-Recurring Charge (i.e., One-time charge)
[6] Assumes Ipswich utilizes existing system

3.16 – NSR911 Server Infrastructure	$0	$0
3.17 – Remote Agency Access	$900	$5,400
3.18 – Station Security	$1,000	$8,000
Total Cost Estimates	$83,660	$489,900

4. STAFFING ANALYSIS

4.1 Town of Ipswich Workload

Under routine operations, the Ipswich 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

4.1.1 911 Volume and Dispatch Responsibilities
The impacts of integrating the additional Ipswich call volume and dispatch responsibilities are discussed in subsequent sections.

4.1.2 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.

4.2 NSR911 Staffing Impact

4.2.1 Dispatcher Staffing
An analysis of data from 2017-2019 was reviewed. Due to the COVID-19 pandemic and typically lower statistics, 2020 data was not reviewed.

The Ipswich PSAP received 2,211- 911 calls, 37,558- administrative telephone calls, and 25,350- CAD Calls for Service in 2019. The Ipswich Police Department records approximately 2,572 police incidents, 246 arrests, and 248 accidents per year. This averages out to seven (7) police incidents per day, <1 arrest per day, and <1 accident per day. The Ipswich Fire Department recorded 1,320 fire incidents, 844 EMS incidents, and 557 fire inspections. This averages out to about 3.6 fire incidents per day, 2.3 EMS calls per day, and about 1.5 fire inspections per day.

During 2019, NSR911 reported a total of 31,297 calls on its 911 system (7,868- 911 calls and 23,429- 2Way Emergency Calls). It also handled 17,539 business phone calls. There were 83,238

law incidents and 9,987 fire incidents for a total of 93,225 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.

Currently, the NSR911 receives approximately 27,500 administrative and non-emergency calls and is projecting that it will log approximately 69,000 police and fire CAD events this year. Coupled with its 911 call volume, the NSR911 is anticipating that it will move to staff four an additional telecommunicator position on all shifts.

4.2.2   Staffing Summary

The projected increase in call volume supports equipping and staffing less than one additional call-taking/telecommunicator console in the NSR911 to support the Ipswich projected workload. A projection of less than one position means that during peak call traffic periods (e.g., rush hour), NSR911 will need to increase call-taking capabilities by one position. During the slower call traffic periods (e.g., midnight to 6 a.m.), no increase in telecommunicator staff will be needed. Adding one additional telecommunicator during peak shifts will require the addition of four telecommunicators to the NSR911 complement to provide position coverage 24x7x365. Industry best practices maintain that a minimum of five people is required to cover one position around the clock. However, NSR911's extensive experience moderates the projections with the workflow methodology of combined call taking and dispatching by all on duty staff. This approach has proven more realistic in that many duties overlap.

The APCO Project RETAINS staffing tool and the Erlang-C calculator was utilized to confirm the projected staff needs based on reported call volume and CAD entries[7]. 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 Ipswich 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 48.9 full-time equivalents or FTEs. Of the 48.9 FTEs, it should be broken out in the following manner: call-taker (5.4), dispatcher (29.8), supervisor (9.7), and administrative staffing (4.0). **NSR911 is currently authorized for 44 FTEs; it would need to hire 5 additional FTEs.**

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.

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[7] For the purposes of APCO Project RETAINS and the Erlang-C calculations, NSR911 only used data from its Regional Operations.

4.2.3   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 foci 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 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 56-005, 911 Call Answering Standard, states, "Ninety percent (90%) of all 911 calls arriving at the Public Safety Answering Point (PSAP) shall be answered within ten seconds

during the busy hour (the hour each day with the greatest call volume, as defined in the NENA Master Glossary 00-001). Ninety-five (95) percent of all 911 calls should be answered within twenty (20) seconds."

❖ The 2019 version of NFPA 1221, Section 7 states, "Ninety percent of alarms[8] received on emergency lines shall be answered within 15 seconds, and 95 percent of alarms shall be answered within 20 seconds" and, "Ninety percent of emergency alarm processing shall be completed within 60 seconds."

❖ The 2019 version of NFPA 1221, 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 "Kep Performance Indicators" document.

4.3 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

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[8] NFPA 1221 defines an alarm as "a signal or message from a person or device indicating the existence of an emergency or other situation that requires action by an emergency response agency."

Other specific training before cutting over Ipswich needs to occur by NSR911 and Ipswich agencies. This training and transition program should include:

- ❖ Identification and standardization of common protocols for Town of Ipswich agencies by agency heads.
- ❖ Adjustments and acclimation to unique requirements for call taking and dispatching of Ipswich emergency responders.
- ❖ Updated radio console and CAD system training that covers the changes implemented in these systems to accommodate the Town of Ipswich
- ❖ Town of Ipswich specific nuances and geography

4.4 Additional Staffing Cost Summary

The following table represents NSR911s costs associated with staffing additional telecommunicators to provide services to the Town of Ipswich at NSR911.

Table 7 - Additional NSR911 staffing costs associated with onboarding Ipswich

Cost Description	Number Needed*	Cost per Person	Low-End Estimate	High-End Estimate
Telecommunicator Salaries (Benefits estimated at 40%, Overtime at 10%)	5	$20.06 to $24.68	$312,936	$385,008
Total Cost Estimates			**$312,936**	**$385,008**
*The table refers to the number of employees needed based on staffing and call volume estimates. It is intended for illustrative and high-level planning purposes only. *This table has no bearing on existing Ipswich PSAP employees should the consolidation take place.*				

5. SPATIAL ANALYSIS

The reported call volume and work activities performed by the Ipswich PSAP equate to a projected increase of one full-time staffed and equipped position. NSR911 has reported that it staffs no more than five of the nine regional call taking/dispatch positions currently deployed, therefore, one of these unoccupied positions can be utilized at no additional cost.

6. TRANSITIONAL COST ANALYSIS

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

6.1 Technology Costs

In Section 3 NSR911 has identified the technology changes required to successfully transition Ipswich to NSR911. For ease of reference, the following table is a duplicate of Table 6 from Section 3.8 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 Ipswich.

Table 8 - Ipswich Technology Integration Cost Estimate Summary

Section	Estimated ARC[9]	Estimated NRC[10]
3.1 – 911 CPE	State Cost	
3.2 – Administrative Telephone Equipment[11]	$1,200	$0
3.3 – CAD Licenses	$0	$1,000
3.4 – RMS Licenses (PD & FD)	$0	$10,000
3.5 – IMC Admin Module	$0	$7,500
3.6 – IMC Mobile System	$0	$25,000
3.7 – Data Conversion	$0	$50,000
3.8 – CAD/RMS Annual Maintenance	$50,000	$0
3.9 – MDTs	$10,560	$154,000
3.10 – Mapping / GIS	$0	$0
3.11.1 – Radio Consoles /Infrastructure at NSR911	$15,000	$110,000
3.11.2 – Radio Network	$5,000	$20,000
3.11.3 – Radio Licensing		$4,000
3.12 – Fire Station Alerting		$90,000
3.13 – Municipal Fire Alarm System	$0	$0
3.14 – Logging Recorder	State Cost	
3.15 – Emergency Notification System		$5,000

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[9] ARC is Annual Recurring Charge
[10] NRC is Non-Recurring Charge (i.e., One-time charge)
[11] Assumes Ipswich utilizes existing system

3.16 – NSR911 Server Infrastructure	**$0**	$0
3.17 – Remote Agency Access	**$900**	$5,400
3.18 – Station Security	**$1,000**	$8,000
Total Cost Estimates	**$83,660**	$489,900

6.2 Staffing Costs

In Section 4 NSR911 has identified the staffing changes required to successfully transition Ipswich to NSR911. For ease of reference, the following table is a duplicate of Table 7 from Section 4.2 and represents the non-recurring 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 consolidation; however, it does identify the significant costs which must be addressed for NSR911 to provide dispatch services for Ipswich.

Table 9 - Additional NSR911 staffing costs associated with onboarding Ipswich

Cost Description	Number Needed[12]	Hourly Cost per Person	Estimate[13]
Telecommunicator Salaries (Benefits estimated at 40%, Overtime at 10%)	4	$20.06 to $24.68	$348,972
Total Cost Estimates			$348,972

6.3 Total Estimated Integration Costs

The following table summarizes annual recurring charges (ARC) and non-recurring charges (NRC) for integrating the Town of Ipswich into NSR911.

Table 10 - Total Estimated Integration Costs

Category	Estimated ARC	Estimated NRC
Technology Costs (Table 8)	$83,660	$489,900
Personnel Costs (Table 9)	$348,972	
Total Estimates	$432,632	$489,900

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[12] This table refers to the number of employees needed based on staffing and call volume estimates. It is intended for illustrative and high level planning purposes only. This table has no bearing on existing Ipswich PSAP employees should the consolidation take place.

[13] Based on the average of the hourly cost per person.

7. APPENDIX A

7.1 <u>PROPOSED CORE SERVICES</u>

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

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